



Guru Nanak Institutions, Nagpur  
• ENGINEERING • MBA • M. TECH • SCHOOL  
ISO 9001 2008 Certified Institutions

Guru Nanak Educational Society's

**GURU NANAK INSTITUTE OF TECHNOLOGY**

APPROVED BY AICTE, DTE & AFFILIATED TO RTM NAGPUR UNIVERSITY, NAGPUR  
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### 3.3.1 Number of research papers published per teacher in the Journals notified on UGC care list during the last five years

#### 3.3.1.1 Number of research papers in the Journals notified on UGC CARE list year wise during the last five years

| Years                                      | 2022-23 | 2021-22 | 2020-21 | 2019-20 | 2018-19 |
|--|---------|---------|---------|---------|---------|
| No. of Research papers                     | 20      | 9       | 15      | 6       | 10      |
| <b>Total No. of Paper Publication = 60</b> |         |         |         |         |         |



**Dr. S. N. Shelke**

**PRINCIPAL**

Principal  
Guru Nanak Institute of  
Technology

### 3.3.1 Number of research papers published per teacher in the Journals listed in UGC CARE

| Sr. No.        | Title of Paper   | Name of the author/s | Department of the teacher | Name of Journal  | Link to the recognition in UGC enlistment of the Journal /Digital Object Identifier (doi) number  |   |
|----------------|--|----------------------|---------------------------|--|---|---|
|                |  |                      |                           |  | Link to website of the Journal  | Link to article / paper / abstract of the article   |
| <b>2022-23</b> |  |                      |                           |  |   |   |
| 1              | Digisecure: Attribute based document transfer solution                           | Dr. Sudhir N. Shelke | CSE                       | International Journal of Intelligent System and Applications in Engineering    | <a href="https://ijisae.org/index.php/IJISAE/issue/archive/2">https://ijisae.org/index.php/IJISAE/issue/archive/2</a>   | <a href="https://ijisae.org/index.php/IJISAE/article/view/3337/1923">https://ijisae.org/index.php/IJISAE/article/view/3337/1923</a>   |
| 2              | Experimental Work on Solar Powered Portable Refrigeration System for Rural Areas | Dr. N.N. Wadaskar    | Mechanical Engineering    | International Journal for Research in Applied Science & Engineering Technology | <a href="https://www.ijraset.com/research-paper/solar-powered-portable-refrigeration-system-for-rural-areas">https://www.ijraset.com/research-paper/solar-powered-portable-refrigeration-system-for-rural-areas</a> | <a href="https://www.ijraset.com/best-journal/experimental-work-on-solar-powered-portable-refrigeration-system-for-rural-areas">https://www.ijraset.com/best-journal/experimental-work-on-solar-powered-portable-refrigeration-system-for-rural-areas</a> |
| 3              | Biodegeration Of Solid Waste Using Biotechnology At Gnit Campus                  | Raju Bondre          | Civil Engineering         | TIJER  | <a href="https://www.tijer.org/tijer/viewpaperforall.php?paper=TIJER2305379">https://www.tijer.org/tijer/viewpaperforall.php?paper=TIJER2305379</a>   | <a href="https://tijer.org/tijer/papers/TIJER2305379.pdf">https://tijer.org/tijer/papers/TIJER2305379.pdf</a>   |
| 4              | Experimental Study on Self-Healing Concrete                                      | Raju Bondre          | Civil Engineering         | TIJER  | <a href="https://tijer.org/tijer/viewpaperforall?paper=TIJER2305377">https://tijer.org/tijer/viewpaperforall?paper=TIJER2305377</a>   | <a href="https://tijer.org/tijer/papers/TIJER2305377">https://tijer.org/tijer/papers/TIJER2305377</a>   |

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|----|---|---|------------------------|----------------------------|---|---|
| 5  | Design of Rigid Pavement for an Existing Road   | Raju Bondre                             | Civil Engineering      | TIJER                      | <a href="https://www.tijer.org/tijer/viewpaperforall.php?paper=TIJER2305376">https://www.tijer.org/tijer/viewpaperforall.php?paper=TIJER2305376</a>   | <a href="https://www.tijer.org/tijer/papers/TIJER2305377.pdf">https://www.tijer.org/tijer/papers/TIJER2305377.pdf</a>   |
| 6  | Analysis & Modeling of Deceleration Behaviour of Light Motor Vehicles   | Sushant M. Gajbhiye                     | Civil Engineering      | NeuroQuantology            | <a href="https://www.neuroquantology.com/archives?volume=Volume%2020&amp;issue=No%2016">https://www.neuroquantology.com/archives?volume=Volume%2020&amp;issue=No%2016</a>   | <a href="file:///C:/Users/admin/Downloads/Research%20Paper%20Published%202022-23%20SMG-1,%20Scopus%20-%20NeuroQuantology.pdf">file:///C:/Users/admin/Downloads/Research%20Paper%20Published%202022-23%20SMG-1,%20Scopus%20-%20NeuroQuantology.pdf</a> |
| 7  | Experimental Investigation of Different Shape Refractory Fire Clay Bricks   | Prof Satish Markad, Prof. A. R. Mankar  | Mechanical Engineering | JETIR                      | <a href="https://www.jetir.org/trackauthorhome.php?ar_id=509188">https://www.jetir.org/trackauthorhome.php?ar_id=509188</a>   | <a href="https://www.jetir.org/trackauthorhome.php?ar_id=509188">https://www.jetir.org/trackauthorhome.php?ar_id=509188</a>   |
| 8  | Experimentation on Automatic operated door glass with sensor of Engine  | Dr.N.N Wadaskar, Prof. Satish S. Markad | Mechanical Engineering | JETIR                      | <a href="https://www.jetir.org/view?paper=JETIR2303062">https://www.jetir.org/view?paper=JETIR2303062</a>   | <a href="http://www.jetir.org/papers/JETIR2303062.pdf">http://www.jetir.org/papers/JETIR2303062.pdf</a>   |
| 9  | Experimental Analysis on mud Tube Air Conditioning Compare with existing  | Prof Satish S. Markad                   | Mechanical Engineering | JETIR                      | <a href="https://www.jetir.org/view?paper=JETIR2303019">https://www.jetir.org/view?paper=JETIR2303019</a>   | <a href="https://www.jetir.org/papers/JETIR2303019.pdf">https://www.jetir.org/papers/JETIR2303019.pdf</a>   |
| 10 | Design And Fabrication Of Multipurpose Material Handling Machine With Oil Cooling System                          | Dr. N. N. Wadaskar, Dr. N. M. Sawai     | Mechanical Engineering | JETIR                      | <a href="https://www.jetir.org/view?paper=JETIR2306331">https://www.jetir.org/view?paper=JETIR2306331</a>   | <a href="https://www.jetir.org/papers/JETIR2306331.pdf">https://www.jetir.org/papers/JETIR2306331.pdf</a>   |
| 11 | Effect Of Magnesium Oxide Nanoparticle On Thermal Stability Of Pmma- Mgo Composite For Technological Applications | Dr. N. M. Sawai                         | Mechanical Engineering | European Chemical Bulletin | <a href="https://www.eurchembull.com/issue-content/effect-of-magnesium-oxide-nanoparticle-on-thermal-stability-of-pmma-mgo-">https://www.eurchembull.com/issue-content/effect-of-magnesium-oxide-nanoparticle-on-thermal-stability-of-pmma-mgo-</a> | <a href="https://www.eurchembull.com/uploads/paper/bd112dd8037c247bff0823ab5d6d6304.pdf">https://www.eurchembull.com/uploads/paper/bd112dd8037c247bff0823ab5d6d6304.pdf</a>   |

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|----|--|-----------------------|------------------------|--|---|---|
|    |  |                       |                        |  | <a href="#">composite-for-technological-applications-11321</a>  |   |
| 12 | Design And Modification Of Mechanism For Potato Chips Cutting  | Prof A R Mankar       | Mechanical Engineering | China Petroleum Processing and Petrochemical Technology                | <a href="https://www.academia.edu/108328639/DESIGN_AND_MODIFICATION_OF_MECHANISM_FOR_POTATO_CHIPS_CUTTING?uc-sb-sw=20736957">https://www.academia.edu/108328639/DESIGN_AND_MODIFICATION_OF_MECHANISM_FOR_POTATO_CHIPS_CUTTING?uc-sb-sw=20736957</a> | <a href="https://www.academia.edu/108328639/DESIGN_AND_MODIFICATION_OF_MECHANISM_FOR_POTATO_CHIPS_CUTTING?uc-sb-sw=20736957">https://www.academia.edu/108328639/DESIGN_AND_MODIFICATION_OF_MECHANISM_FOR_POTATO_CHIPS_CUTTING?uc-sb-sw=20736957</a> |
| 13 | Flow Stress Modeling of Tube and Slab Route Sheets of Zircaloy-4 Using Machine Learning Techniques and Arrhenius Type Constitutive Equations | Prof. Pankaj Wankhede | Mechanical Engineering | Journal of Materials Engineering and Performance                       | <a href="https://link.springer.com/journal/11665">https://link.springer.com/journal/11665</a>   | <a href="https://doi.org/10.1007/s11665-022-07102-x">https://doi.org/10.1007/s11665-022-07102-x</a>   |
| 14 | A portable device for single point strain analysis in sheet metal forming processes  | Prof. Pankaj Wankhede | Mechanical Engineering | HardwareX Journal  | <a href="https://www.sciencedirect.com/science/article/pii/S246806722200116X">https://www.sciencedirect.com/science/article/pii/S246806722200116X</a>   | <a href="https://doi.org/10.1016/j.ohx.2022.e00371">https://doi.org/10.1016/j.ohx.2022.e00371</a>   |
| 15 | Integrated fuzzy AHP and fuzzy TOPSIS for multi response optimization in incremental forming process   | Prof. Pankaj Wankhede | Mechanical Engineering | International Journal on Interactive Design and Manufacturing (IJIDeM) | <a href="https://link.springer.com/article/10.1007/s12008-023-01246-3">https://link.springer.com/article/10.1007/s12008-023-01246-3</a>   | <a href="https://doi.org/10.1007/s12008-023-01246-3">https://doi.org/10.1007/s12008-023-01246-3</a>   |
| 16 | SPSA: An image processing based software for single point strain analysis  | Prof. Pankaj Wankhede | Mechanical Engineering | Software Impacts Journal   | <a href="https://www.sciencedirect.com/science/article/pii/S2665963823000210">https://www.sciencedirect.com/science/article/pii/S2665963823000210</a>   | <a href="https://doi.org/10.1016/j.simpa.2023.100484">https://doi.org/10.1016/j.simpa.2023.100484</a>   |

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|----|--|-------------------------------|------------------|--|---|---|
| 17 | High color purity and color tunability in Sm <sup>3+</sup> /Eu <sup>3+</sup> activated/co-activated Sr <sub>6</sub> Ca <sub>4</sub> (PO <sub>4</sub> ) <sub>6</sub> F <sub>2</sub> phosphor for WLED and display devices application | Prof. Sadaf Gauhar            | ASH (First Year) | Journal of Molecular Structure                             | <a href="https://www.sciencedirect.com/science/article/abs/pii/S002228602202155X">https://www.sciencedirect.com/science/article/abs/pii/S002228602202155X</a>                         | <a href="https://doi.org/10.1016/j.molstruc.2022.134510">https://doi.org/10.1016/j.molstruc.2022.134510</a> |
| 18 | Optical properties of RE (RE = Eu <sup>3+</sup> , Dy <sup>3+</sup> , Sm <sup>3+</sup> , Ce <sup>3+</sup> )-doped BaSr <sub>2</sub> (PO <sub>4</sub> ) <sub>2</sub> phosphor  | Prof. Sadaf Gauhar            | ASH (First Year) | Indian Journal of Physics                                  | <a href="https://link.springer.com/article/10.1007/s12648-022-02578-8">https://link.springer.com/article/10.1007/s12648-022-02578-8</a>   | <a href="https://doi.org/10.1007/s12648-022-02578-8">https://doi.org/10.1007/s12648-022-02578-8</a>         |
| 19 | Optical and thermal properties of rare earth-doped K <sub>4</sub> Ca(PO <sub>4</sub> ) <sub>2</sub> phosphor   | Prof. Sadaf Gauhar            | ASH (First Year) | Luminescence Journal                                       | <a href="https://analyticalsciencejournals.online.library.wiley.com/doi/abs/10.1002/bio.4470">https://analyticalsciencejournals.online.library.wiley.com/doi/abs/10.1002/bio.4470</a> | <a href="https://doi.org/10.1002/bio.4470">https://doi.org/10.1002/bio.4470</a>                             |
| 20 | Blockchain Technology: Growing Usecases and Issues to Tackle   | Prof. Firdous Sadaf M. Ismail | CSE              | International Journal of Next-Generation Computing (IJNGC) | <a href="https://ijngc.perpetualinnovation.net/index.php/ijngc/article/view/917">https://ijngc.perpetualinnovation.net/index.php/ijngc/article/view/917</a>                           | <a href="https://doi.org/10.47164/ijngc.v13i5.917">https://doi.org/10.47164/ijngc.v13i5.917</a>             |

**2021-22**

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|---|---|--|-------------------|---|---|---|
| 1 | Constructed Wetlands –Lake Water Treatment Using Aquatic Plants | Prof. Sushant M. Gajbhiye                    | Civil Engineering | International Journal of Innovative Research in Science, Engineering and Technology | <a href="https://www.ijirset.com/volume-10-issue-6.html">https://www.ijirset.com/volume-10-issue-6.html</a>                               | <a href="https://www.ijirset.com/upload/2021/june/246_MUKUL_NC.pdf">https://www.ijirset.com/upload/2021/june/246_MUKUL_NC.pdf</a>                   |
| 2 | Modeling Of Acceleration Behaviour Of Light Motor Vehicles      | Prof. Sushant M. Gajbhiye, Prof. Raju Bondre | Civil Engineering | Elementary Education Online   | <a href="https://ilkogretim-online.org/index.php/pub/article/view/5106">https://ilkogretim-online.org/index.php/pub/article/view/5106</a> | <a href="https://ilkogretim-online.org/index.php/pub/article/view/5106/4949">https://ilkogretim-online.org/index.php/pub/article/view/5106/4949</a> |
| 3 | An Attempt for comparing different techniques of image fusion   | Dr. Sudhir N. Shelke                         | CSE               | Elementary Education Online, Ilkogretim Online                                      | <a href="https://ilkogretim-online.org/index.php/pub/article/view/2896">https://ilkogretim-online.org/index.php/pub/article/view/2896</a> | <a href="https://ilkogretim-online.org/index.php/pub/article/view/2896/2828">https://ilkogretim-online.org/index.php/pub/article/view/2896/2828</a> |

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|----------------|---|---|------------------------|---|---|---|
| 4              | Design and Simulation of Optical Code Converters  | Dr. Sudhir N. Shelke  | CSE                    | Elementary Education Online, Ilkogretim Online  | <a href="https://ilkogretim-online.org/index.php/pub/article/view/4289">https://ilkogretim-online.org/index.php/pub/article/view/4289</a>   | <a href="https://ilkogretim-online.org/index.php/pub/article/view/4289/4166">https://ilkogretim-online.org/index.php/pub/article/view/4289/4166</a> |
| 5              | Failure Mode and Effect Analysis of Transmission Case of a Tractor  | Dr. Rakesh Vidhate, Dr. Nandkishor Sawai & Dr. S. N. Shelke | Mechanical Engineering | International Journal of Mechanical Engineering   | <a href="https://www.kalaharijournals.com/ijme.php">https://www.kalaharijournals.com/ijme.php</a>   | <a href="https://kalaharijournals.com/resources/SP%20Jan_Mar_170.pdf">https://kalaharijournals.com/resources/SP%20Jan_Mar_170.pdf</a>               |
| 6              | A low cost surface strain measurement system using image processing for sheet metal forming applications                                    | Prof. Pankaj Wankhede                                       | Mechanical Engineering | Measurement Journal   | <a href="https://www.sciencedirect.com/science/article/abs/pii/S0263224121011775">https://www.sciencedirect.com/science/article/abs/pii/S0263224121011775</a>                         | <a href="https://doi.org/10.1016/j.measurement.2021.110273">https://doi.org/10.1016/j.measurement.2021.110273</a>                                   |
| 7              | Heat treatment and temperature effects on formability of AA2014-T6 in incremental forming   | Prof. Pankaj Wankhede                                       | Mechanical Engineering | Materials and Manufacturing Processes (Taylor & Francis Online)   | <a href="https://www.tandfonline.com/doi/abs/10.1080/10426914.2021.2016813">https://www.tandfonline.com/doi/abs/10.1080/10426914.2021.2016813</a>                                     | <a href="https://doi.org/10.1080/10426914.2021.2016813">https://doi.org/10.1080/10426914.2021.2016813</a>   |
| 8              | A comparative study on the effect of grid printing methods and camera hardware in automatic strain measurement through CGA                  | Prof. Pankaj Wankhede                                       | Mechanical Engineering | Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering | <a href="https://journals.sagepub.com/doi/10.1177/09544089221107527">https://journals.sagepub.com/doi/10.1177/09544089221107527</a>   | <a href="https://doi.org/10.1177/09544089221107527">https://doi.org/10.1177/09544089221107527</a>   |
| 9              | Energy transfer process in a rare earth (Ce <sup>3+</sup> , Dy <sup>3+</sup> , Sm <sup>3+</sup> )- doped nanocrystalline phosphate phosphor | Prof. Sadaf Gauhar  | ASH (First Year)       | Luminescence Journal  | <a href="https://analyticalsciencejournals.online.library.wiley.com/doi/abs/10.1002/bio.4254">https://analyticalsciencejournals.online.library.wiley.com/doi/abs/10.1002/bio.4254</a> | <a href="https://doi.org/10.1002/bio.4254">https://doi.org/10.1002/bio.4254</a>   |
| <b>2020-21</b> |   |   |                        |   |   |   |
| 1              | Experimental investigation of Heat Transfer Enhancement for using different arrangement of Rectangular Fin                                  | Dr.Narendra N.Wadaskar                                      | Mechanical Engineering | IRJET-International Research Journal of Engineering and Technology  | <a href="https://www.irjet.net/volume7-issue06">https://www.irjet.net/volume7-issue06</a>   | <a href="https://www.irjet.net/archives/V7/i6/IRJET-V7I61360.pdf">https://www.irjet.net/archives/V7/i6/IRJET-V7I61360.pdf</a>                       |



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 Website : www.gninagpur.info E-mail : gni.principalgnit@gmail.com



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|---|--|------------------------|------------------------|---|---|---|
| 2 | Experimental investigation of Heat Transfer Enhancement for using protrusion patterned surface | Dr.Narendra N.Wadaskar | Mechanical Engineering | Journal of emerging technologies and innovative research                                      | <a href="https://www.jetir.org/view?paper=JETIR2007087">https://www.jetir.org/view?paper=JETIR2007087</a>   | <a href="https://www.jetir.org/papers/JETIR2007087.pdf">https://www.jetir.org/papers/JETIR2007087.pdf</a>   |
| 3 | Solar Power Sand Filter  | Dr.Narendra N.Wadaskar | Mechanical Engineering | STD JOURNAL (International Journal of Scientific Research in Engineering & Management-IJSREM) | <a href="https://ijsrem.com/download/solar-power-sand-filter/">https://ijsrem.com/download/solar-power-sand-filter/</a>   | <a href="https://ijsrem.com/download/solar-power-sand-filter/">https://ijsrem.com/download/solar-power-sand-filter/</a>   |
| 4 | Design And Modification in Go-Kart   | Satish S.Markad        | Mechanical Engineering | International Journal of All Research Education & Scientific Management (IJARESM)             | <a href="https://www.academia.edu/43313542/Design_and_Modification_in_Go_Kart">https://www.academia.edu/43313542/Design_and_Modification_in_Go_Kart</a>   | <a href="https://www.academia.edu/43313542/Design_and_Modification_in_Go_Kart">https://www.academia.edu/43313542/Design_and_Modification_in_Go_Kart</a>           |
| 5 | Review on Solar Tree with Wind Turbine   | Satish S.Markad        | Mechanical Engineering | IJESC   | <a href="https://www.academia.edu/79069570/Review_on_Solar_Tree_with_Wind_Turbine?uc-sb-sw=113563950">https://www.academia.edu/79069570/Review_on_Solar_Tree_with_Wind_Turbine?uc-sb-sw=113563950</a> | <a href="https://www.google.com/search?q='Solar+Tree+With+Wind+Turbine+'(2250-1371">https://www.google.com/search?q='Solar+Tree+With+Wind+Turbine+'(2250-1371</a> |
| 6 | Generation of Hydrogen Gas From Solar Energy   | Prof.Avinash R Mankar  | Mechanical Engineering | International Journal of Scientific Research in Engineering & Management (IJSREM)             | <a href="https://ijsrem.com/download/generation-of-hydrogen-gas-from-solar-energy/">https://ijsrem.com/download/generation-of-hydrogen-gas-from-solar-energy/</a>                                     | <a href="https://ijsrem.com/download/generation-of-hydrogen-gas-from-solar-energy/">https://ijsrem.com/download/generation-of-hydrogen-gas-from-solar-energy/</a> |
| 7 | Water Extraction from Atmospheric Air  | Prof.Avinash R Mankar  | Mechanical Engineering | International Journal of All Research Education & Scientific Methods (IJARESM)                | <a href="http://www.ijaresm.com/water-extraction-from-atmospheric-air">http://www.ijaresm.com/water-extraction-from-atmospheric-air</a>   | <a href="http://www.ijaresm.com/water-extraction-from-atmospheric-air">http://www.ijaresm.com/water-extraction-from-atmospheric-air</a>                           |
| 8 | Experimental Analysis Of Power Generation Using Speed Breaker                                  | Prof.Avinash R Mankar  | Mechanical Engineering | International Journal of Research and Analytical Reviews (IJRAR)                              | <a href="http://www.ijrar.org">www.ijrar.org</a>  | <a href="http://www.ijrar.org">www.ijrar.org</a>  |

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|----|--|------------------------|------------------------|---|---|---|
| 9  | Comparative study of compressive strength using bacterial concrete                                 | Prof. Dilip Budlani    | Civil Engineering      | Journal of emerging technologies and innovative research                                      | <a href="https://www.jetir.org/view?paper=JETIR2107283">https://www.jetir.org/view?paper=JETIR2107283</a>   | <a href="https://www.jetir.org/papers/JETIR2107283.pdf">https://www.jetir.org/papers/JETIR2107283.pdf</a>   |
| 10 | Seismic performance assessment of irregular RC building  | Prof. Dilip Budlani    | Civil Engineering      | Journal of emerging technologies and innovative research                                      | <a href="https://www.jetir.org/view?paper=JETIR2107282">https://www.jetir.org/view?paper=JETIR2107282</a>   | <a href="https://www.jetir.org/papers/JETIR2107282.pdf">https://www.jetir.org/papers/JETIR2107282.pdf</a>   |
| 11 | Acid effect on waste foundry sand  | Prof. Sushant Gajbhiye | Civil Engineering      | International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET) | <a href="https://www.ijirset.com/volume-10-issue-7.html">https://www.ijirset.com/volume-10-issue-7.html</a>                                       | <a href="https://www.ijirset.com/upload/2021/july/114_Acid_NC.pdf">https://www.ijirset.com/upload/2021/july/114_Acid_NC.pdf</a>                                 |
| 12 | Reliability analysis of high rise building   | Prof. Sushant Gajbhiye | Civil Engineering      | Journal of emerging technologies and innovative research                                      | <a href="https://www.jetir.org/view?paper=JETIR2107284">https://www.jetir.org/view?paper=JETIR2107284</a>   | <a href="https://www.jetir.org/papers/JETIR2107284.pdf">https://www.jetir.org/papers/JETIR2107284.pdf</a>   |
| 13 | CGA: An image processing based software for surface strain analysis in sheet metal forming         | Prof. Pankaj Wankhede  | Mechanical Engineering | The Journal of Strain Analysis for Engineering Design (Sage Journals)                         | <a href="https://journals.sagepub.com/doi/10.1177/0309324721996575">https://journals.sagepub.com/doi/10.1177/0309324721996575</a>                 | <a href="https://doi.org/10.1177/0309324721996575">https://doi.org/10.1177/0309324721996575</a>   |
| 14 | Corner detection of a quadrilateral for strain analysis in sheet metal forming by image processing | Prof. Pankaj Wankhede  | Mechanical Engineering | Advances in Materials and Processing Technologies (Taylor & Francis Online)                   | <a href="https://www.tandfonline.com/doi/abs/10.1080/2374068X.2021.1878710">https://www.tandfonline.com/doi/abs/10.1080/2374068X.2021.1878710</a> | <a href="https://doi.org/10.1080/2374068X.2021.1878710">https://doi.org/10.1080/2374068X.2021.1878710</a>   |
| 15 | Review on LINBO3 based EO-MZI for designming Optoelectronics devices for WDM systems               | Dr. Sudhir N. Shelke   | ETC                    | Journal of Critical Reviews   | <a href="http://www.jcreview.com/index.php">http://www.jcreview.com/index.php</a>   | <a href="https://www.jcreview.com/admin/Uploads/Files/6443fb2005be77.86509214.pdf">https://www.jcreview.com/admin/Uploads/Files/6443fb2005be77.86509214.pdf</a> |

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| 1 | A New Harmonics Elimination method Applied to a Static Var Compensator                | Ankush Kosare                      | Electrical Engg.      | Journal of Engineering, Computing & Architecture                   | <a href="https://ijrpublisher.com/index.php/volume-6-issue-10-2017/">https://ijrpublisher.com/index.php/volume-6-issue-10-2017/</a>               | <a href="https://doi.org/10.236456.2572">DOI:16.10089.IJR.2017.V6I10.236456.2572</a>  |
| 2 | DESIGN OF STAIR-CLIMBING WHEELCHAIR USING TRI-WHEEL MECHANISM                         | Suyog Bhajankar                    | Mechanical Department | Journal of Emerging Technologies and Innovative Research (JETIR)   | <a href="https://www.jetir.org/view?paper=JETIR2005049">https://www.jetir.org/view?paper=JETIR2005049</a>   | <a href="https://www.jetir.org/papers/JETIR2005049.pdf">https://www.jetir.org/papers/JETIR2005049.pdf</a>                           |
| 3 | Experimental Analysis of Heat Transfer In Porous Medium With Different Material       | Dr. N.N. Wadaskar                  | Mechanical Department | International Journal of Innovations in Engineering and Science    | <a href="http://www.ijes.net/archives/vol-4-no-9">http://www.ijes.net/archives/vol-4-no-9</a>   | <a href="http://www.ijes.net/finial-docs/finial-pdf/130619496.pdf">http://www.ijes.net/finial-docs/finial-pdf/130619496.pdf</a>     |
| 4 | Design, Analysis and Fabrication of Instant water cooler using Thermo electric Module | Dr. N.N. Wadaskar, Suyog Bhajankar | Mechanical Department | International Journals for Modern Trends in Science and Technology | <a href="http://www.ijmtst.com/vol6issue07.html">http://www.ijmtst.com/vol6issue07.html</a>   | <a href="http://www.ijmtst.com/volume6/issue07/20.IJMTST0607053.pdf">http://www.ijmtst.com/volume6/issue07/20.IJMTST0607053.pdf</a> |
| 5 | Development and Testing of Photovoltaic panel for Cooling Under Natural Condition     | Suyog Bhajankar                    | Mechanical Department | International Journals of Creative Thoughts                        | <a href="https://ijcrt.org/viewfull.php?&amp;_id=IJCRT2007280">https://ijcrt.org/viewfull.php?&amp;_id=IJCRT2007280</a>                           | <a href="https://ijcrt.org/papers/IJCRT2007280.pdf">https://ijcrt.org/papers/IJCRT2007280.pdf</a>                                   |
| 6 | A review on the evaluation of formability in sheet metal forming                      | Prof. Pankaj Wankhede              | Mechanical Department | Taylor & Francis Online  | <a href="https://www.tandfonline.com/doi/abs/10.1080/2374068X.2020.1731229">https://www.tandfonline.com/doi/abs/10.1080/2374068X.2020.1731229</a> | <a href="https://doi.org/10.1080/2374068X.2020.1731229">https://doi.org/10.1080/2374068X.2020.1731229</a>                           |

**2018-19**

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|---|--|-------------------|-----|-------|---|---|
| 1 | Cloud Computing Security Issues in IAAS Services: A Review | Neeranjan Chitare | CSE | IJPAM | <a href="https://acadpub.l.eu/hub/2018-120-6/issue7.html">https://acadpub.l.eu/hub/2018-120-6/issue7.html</a> | <a href="https://acadpub.l.eu/hub/2018-120-6/7/683.pdf">https://acadpub.l.eu/hub/2018-120-6/7/683.pdf</a> |
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| 2 | Cloud Computing IT's Adoption Challenges   | Manjusha Talmale  | CSE               | IRJET   | <a href="https://www.irjet.net/">https://www.irjet.net/</a>   | <a href="https://www.irjet.net/">https://www.irjet.net/</a>   |
| 3 | GSM Based Electricity Theft Detection in Distributed Systems   | Dr. Sudhir Shelke | ETC               | JETIR   | <a href="https://www.jetir.org/view.php?paper=JETIR1903B64">https://www.jetir.org/view.php?paper=JETIR1903B64</a>                         | <a href="https://www.jetir.org/papers/JETIR1903B64.pdf">https://www.jetir.org/papers/JETIR1903B64.pdf</a>                                 |
| 4 | Management & Observing Dam Gate Level Using IoT  | Neha Chourasia    | ETC               | IJRAR   | <a href="https://ijrar.org/">https://ijrar.org/</a>   | <a href="https://ijrar.org/">https://ijrar.org/</a>   |
| 5 | A review on Internet of Things IoT Based Underground Cable Fault Detection   | Neha Chourasia    | ETC               | JETIR   | <a href="https://www.jetir.org/view?paper=JETIRBV06068">https://www.jetir.org/view?paper=JETIRBV06068</a>                                 | <a href="https://www.jetir.org/papers/JETIRBV06068.pdf">https://www.jetir.org/papers/JETIRBV06068.pdf</a>                                 |
| 6 | Driving Super Capacitor Equipped Metro Train Using Microcontroller   | Ankush Kosare     | EE                | IOSRJEN | <a href="http://iosrjen.org/pages/volume9-issue5(series-4).html">http://iosrjen.org/pages/volume9-issue5(series-4).html</a>               | <a href="http://iosrjen.org/Papers/vol9_issue5/Series-4/13%2064-70.pdf">http://iosrjen.org/Papers/vol9_issue5/Series-4/13%2064-70.pdf</a> |
| 7 | Analysis and design of G+6 Building in different seismic zones by using software   | Dr. G. D. Awachat | Civil Engineering | IJRASET | <a href="https://www.ijraset.com/ijraset-volume/volume7-issueV-may2019">https://www.ijraset.com/ijraset-volume/volume7-issueV-may2019</a> | <a href="https://www.ijraset.com/fileserve.php?FID=22669">https://www.ijraset.com/fileserve.php?FID=22669</a>                             |
| 8 | Comparing the effect of earthquake on high rise building with and without shear wall and shear wall with opening by using software | Dr. G. D. Awachat | Civil Engineering | IJRASET | <a href="https://www.ijraset.com/ijraset-volume/volume7-issueV-may2019">https://www.ijraset.com/ijraset-volume/volume7-issueV-may2019</a> | <a href="https://www.ijraset.com/fileserve.php?FID=22804">https://www.ijraset.com/fileserve.php?FID=22804</a>                             |

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|----|---|-------------------|-------------------|---------|---|---|
| 9  | Review paper on static analysis and design of retaining wall with and without shelve using software | Dr. G. D. Awachat | Civil Engineering | IJRASET | <a href="https://www.ijraset.com/ijraset-volume/volume7-issueV-may2019">https://www.ijraset.com/ijraset-volume/volume7-issueV-may2019</a> | <a href="https://www.ijraset.com/fileserve.php?FID=22569">https://www.ijraset.com/fileserve.php?FID=22569</a> |
| 10 | Soil Interaction effect in multi-storied building with cohesive and non-cohesive soil               | Dr. G. D. Awachat | Civil Engineering | IJRASET | <a href="https://www.ijraset.com/ijraset-volume/volume7-issueV-may2019">https://www.ijraset.com/ijraset-volume/volume7-issueV-may2019</a> | <a href="https://www.ijraset.com/fileserve.php?FID=22943">https://www.ijraset.com/fileserve.php?FID=22943</a> |



# Academic year

## 2022-23

**Proof of Research Papers notified in**  
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## DigiSecure: Attribute-Based Document Transfer Solution

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**Abstract:** There are two examples of techniques for guaranteeing user credentials and facts secrecy are authentication and cryptosystems. Message Digest is used to check the uniqueness and accurateness of data traveling over an open channel due to its one-way nature. It recognizes unauthorized alterations and additions to broadcasts. When it comes to document uniqueness and creator oneness, digital signatures frequently use hashing. It is categorized as an attribute-based signature (ABS) and is updated by including new details about the attributes of the users. We looked at many historical approaches to the ABS phenomenon and identified some problems that needed to be handled. As a result, we came up with a solution that lowers the level of difficulty, usage, and operating expense while still enabling signature production and confirmation. We proposed an original DigiSecure: Attribute-Based Document Transfer Solution for Transporting Digital Document to highlight the approach of digital signatures using foundations and their initial reason. The system has policy-based access security limitations as well as adaptable primitives that offer signing authority total control over signature generation. It safeguards the secrecy of signatures and has a first order logic that is message-based. Various advantages were found after rationally studying the method, and these advantages will soon be proven by implementing the solution over the suggested outline under the given significant component.

**Keywords:** Data Security, MD, Digital\_Signature, Rivest, Shamir, Adleman Algorithm, Signature Built on Features, X.509Certificate.

### 1. Introduction

Cryptosystems are temporary systems for security of data and its protection that are set up to handle unauthorized solutions. All of the mathematically sophisticated representations are sufficiently strong to manage illegal access and changes. This is a mathematically challenging problem, and it is necessary to assume the complexity of the system, which is trackable and used as the primary building block for a security solution. Depending on the key used, cryptography systems are categorized as symmetric or asymmetric. Few instances of these cryptosystems include Data Encryption Standard and Advanced Encryption Standard, Rivest, Shamir, Adleman. Together, the cryptographic techniques triple DES, RSA, and MD5 are utilized to transmit data securely over Bluetooth. [16]. The mentioned cryptography systems' tools offer random visions for confirming the security of a goal. Subject to the restriction that the response is distinct for different inquiries, but it can be the same when the same notion is requested again, an arbitrary exposure replies to inquiries in an arbitrary manner. Two desirable characteristics of such an oracle are pre-image resistance and impact resistance [1-3]. To increase the practical approach to problem solving, one must adopt certain engaging instructional learning methodologies in order to comprehend the fundamentals of digital signature generation and verification. [17].

These cryptography systems' tools enable users to verify a goal's security in a variety of ways. Two desirable characteristics of such an oracle are pre-image resistance and collision resistance [1-3]. To understand the fundamentals of creating and verifying digital signatures and to enhance one's ability to solve problems practically, one must adopt certain engaging instructional learning techniques.

### 2. Materials and Methods

Due to their extensive client infrastructure, services, and hyper-visor virtualization technologies, internet applications are becoming denser. It offers consumers a service model that allows them to employ any computation paradigm based on a tenancy model to solve their problems. The technique in mentioned paper [7] has been suggested since the problem is what such protection service area are supplied to end users in a desirable way. Evaluating security requirements is essential because Internet-based application service providers no longer guarantee the privacy of customer data. This is one of the additional elements of data security. Stages of security for each data object should be as follows:

Stage 1: Sending file over regular and encrypted set of rules.

Stage 2 involves access control for file, but without encrypting data inside.

Stage 3 involves access control techniques, such as encrypting the data inside data objects.

Stage 4: Access control techniques (including data and file encryption) and rights management tools (such as

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# Experimental Work on Solar Powered Portable Refrigeration System for Rural Areas

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**Abstract:** The increase in demand for refrigeration globally in the field of air-conditioning, food preservation, medical services, vaccine storages, and for electronic components temperature control led to the production of more electricity and consequently an increase in the CO<sub>2</sub> concentration in the atmosphere which in turn leads to global warming and many climatic changes. Thermoelectric refrigeration is a new alternative because it can reduce the use of electricity to produce cooling effect and also meet today's energy challenges. Therefore, the need for thermoelectric refrigeration in developing countries is very high where long life and low maintenance are needed. The objectives of this study is to develop a working thermoelectric refrigerator to cool a volume 5L cabin that utilizes the Peltier effect to cool and maintain a selected temperature range of 5 °C to 25 °C. The cooling chamber design integrates thermoelectric modules (TEMs), which operate on the Peltier effect to cool juicer down to nearly 18°C. Solar panel added advantage to provide the energy. The design and fabrication of solar powered thermoelectric refrigerator for required applications are presented.

**Keywords:** Solar energy, Thermoelectric generator, heat sink, refrigeration unit etc.

## I. INTRODUCTION

As the demand for refrigeration in various fields increases and the electricity production increases, the emission of harmful gases such as CO<sub>2</sub> is increasing worldwide, which is causing global warming and climate change. Thermoelectric cooling is a new alternative method. Thermoelectric modules are made of semiconductor materials that are electrically connected in series and thermally connected in parallel to create a cold and hot surface. Although less efficient than vapor compression systems, they are very light, inexpensive, quiet in operation and environmentally friendly.

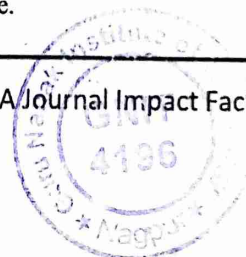
Traditional refrigeration systems in use today require a refrigerant that undergoes a phase change through heat exchange and a compressor that compresses the refrigerant. The compressor required more power and space. Refrigerants are also not environmentally friendly, increase global warming and are a major cause of ozone layer depletion.

The eco-friendly mini refrigerator is cooled by using a thermoelectric element called a Peltier element based on the PELTIER EFFECT. MEFR refrigerators do not require a compressor or refrigerant. Semiconductor thermoelectric coolers with temperature control ( $< \pm 0.1$  °C) (also called Peltier coolers) can be achieved with Peltier coolers. However, the efficiency is low compared to conventional refrigerators. It is therefore used in niche applications where the inherent advantages outweigh the low performance. Although some large-scale applications (submarines and watercraft) have been considered, Peltier coolers are generally used for applications that require small size and do not have too large cooling requirements, such as cooling electronic components.

The main aim of this project is to develop a portable thermoelectric cooling system capable of maintaining vaccine temperatures between 8°C and 13°C. The main system consisted of a thermoelectric module as a cooling generator with an isolated cabin, battery and charger. Thermoelectric elements perform the same cooling function as vapor compression or absorption refrigerators based on Freon. Several criteria must be met to ensure the success of this project, such as portability, system size, and cost. The conservation design is based on the principle of a thermoelectric module (ie the Peltier effect) to create a hot side and a cold side. The cold side of the thermoelectric module is used for cooling. Make sure the vaccine chamber is cool.

## II. PROBLEM DEFINITION

The system is designed for use in residential homes, offices, small vendors, and more. to provide a low-energy alternative to expensive and energy-intensive mobile solar refrigeration system refrigerators. The system was designed with size in mind. The inner chamber uses thermoelectric modules to cool the internal environment. Thermoelectric modules (TEMs) work based on the Peltier effect, where a temperature difference is created across the module when an electric current is applied. Heat is absorbed by the surface on the cold side and removed on the hot side of the module.



# BIODEGRADATION OF SOLID WASTE USING BIOTECHNOLOGY At GNIT Campus

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**Abstract** - The biodegradation of organic waste can be accomplished through composting, which is both efficient and sustainable. Microorganisms are used in the procedure to transform organic waste, such as food scraps and garden waste, into a nutrient-rich soil supplement. Composting has a number of advantages, such as lowering the quantity of trash dumped in landfills, enhancing the fertility and health of the soil, and lowering greenhouse gas emissions. This review paper addresses the fundamentals of composting, the variables that affect the procedure, and the potential of composting in solid waste management. The paper indicates that composting is an effective method for managing organic waste, but more study is required to improve the procedure and examine its potential for degrading other forms of trash.

## Index Terms - Preparaton Of Compost

1. Size Of The Compost Pit
2. Segregation Of Waste Generated
3. Production Of Compost
4. Analysis Of Gases

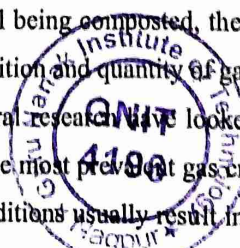
## I. INTRODUCTION

When microorganisms decompose organic materials into simpler chemicals, composting is a biodegradation process that happens naturally. Organic waste, including leftover food, yard waste, and other biodegradable items, are transformed through this process into a nutrient-rich soil amendment that can be used to increase the fertility and health of the soil. Making the ideal circumstances for microorganisms to flourish and decompose organic matter is the goal of composting, which can be done in a small or large-scale setting. The mesophile, thermophile, and maturation stages of the composting process can all be broken down into these three phases. As the organic matter decomposes during the mesophile stage, mesophile bacteria release carbon dioxide and heat. The breakdown of organic matter continues at greater temperatures, up to 160°F, during the thermophiles stage, when thermophile microbes gain control. In the maturation stage, the compost stabilises and cools, turning into a black, crumbly mass that is nutrient- and microorganism-rich. The kind of material being composted, the volume of the compost pile, and the environmental conditions all affect how long the process takes. In order to ensure a good composting process and avoid the buildup of dangerous germs or the emission of unpleasant odours, the compost pile must be managed properly. Composting is an easy and efficient strategy to lessen the amount of organic waste that ends up in landfills and to create a useful soil amendment that can support sustainable farming and landscaping techniques.

In the process of aerobic composting, microorganisms break down organic material in the presence of oxygen, releasing byproducts such as heat, carbon dioxide, and water vapour. The type of material being composted, the size and configuration of the composting system, and the ambient conditions all have an impact on the composition and quantity of gases produced during the process.

With an emphasis on carbon dioxide, methane, and ammonia, several researchers have looked into the gases produced during aerobic composting. As a result of microbial respiration, carbon dioxide is the most prevalent gas created throughout the composting process.

While methane is also produced during composting, the aerobic conditions usually result in low methane concentrations. Ammonia is



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# Experimental Study on Self-Healing Concrete

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**Abstract** - Self-healing concrete is a promising technology that could increase the useful life of concrete constructions while requiring less upkeep. Incorporating microcapsules containing therapeutic drugs into concrete is the subject of this experimental study to determine its efficacy. In order to conduct the study, concrete samples containing various amounts of microcapsules must be prepared and mechanically damaged. Several tests, including those for water permeability, strength recovery, and fracture healing, are used to assess the concrete's self-healing capabilities. The findings demonstrate that adding microcapsules improves the concrete's capacity for self-healing, and that as the percentage of microcapsules rises, so does the effectiveness of the healing process. This study offers insightful information on how self-healing concrete might be used in the building sector.

## Index Terms - Methods

1. Concrete Preparation
2. Mix Proportions
3. Mix proportions for M20 grade concrete
4. Mix proportions for M40 grade concrete

## I. INTRODUCTION

### 1.1 General

The most often utilised building material is concrete, which is employed in public structures.

One of the inherent weaknesses of concrete is cracks. On the basis of ongoing research conducted all around the world, numerous adjustments have occasionally been made to address the shortcomings of cement concrete. With the use of industrial materials like fly ash, blast furnace slag, silica fume, etc., ongoing research in the field of concrete technology has led to the development of special concretes that take into account the speed of construction, the strength of concrete, durability of concrete, and the environmental friendliness of concrete. Recently, it has been discovered that the general behaviour of concrete can be enhanced by microbial mineral precipitation brought on by the metabolic activities of beneficial microorganisms.

By incorporating bacteria that can continuously precipitate calcite into the concrete, bacterial concrete can be created. Microbiologically generated calcite precipitation is the name given to this event. Concrete cracks can be successfully repaired by *Bacillus subtilis*. A common soil bacterium, *bacillus subtilis* je3, is employed to induce CaCa<sub>3</sub> precipitation. Calcite generation by *bacillus subtilis* is a laboratory bacteria that may manufacture calcite that precipitates on suitable medium supplied with a calcium source. The ideal circumstances are not directly present in concrete. The majority of the effort will be devoted to examining how the ideal circumstances might be developed for the bacteria to manufacture as much calcite as required to fill gaps in addition to allowing them to survive in the concrete.

### 1.2 Self-Healing of concrete

Concrete that self-heals cracks in itself would increase the material's durability and sustainability while also extending its useful life in buildings.



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# Design of Rigid Pavement for an Existing Road

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**Abstract** - Pavements, which are typically referred to as flexible and unyielding Pavements, are meant to facilitate the safe, orderly, and smooth entry of traffic. The most commonly used terms for adaptable and unbending pavements are adaptable pavements. Low flexural strength and adaptability in their principal function under stresses are characteristics of adaptable pavements. Pavements that are unbending have minimal flexural strength and are flexible in their principal function as opposed to those that have both essential flexural strength and flexural inflexibility. In order to reduce the expense of vehicles, the huge improvement in auto versatile innovation has led to heavy moving burdens on the existing motorways. The current streets, which were constructed based on general guidelines, cannot adequately support heavy wheel loads, causing them to collapse. According to the specifications of a pavement plan, an effort is made in the venture report to plan a roadway in Paratwada. In order to ensure the soil's properties, such as consistency limit, strainer examination, CBR values, and others, soil tests are conducted on the street's current layout. The thickness of the flexible pavement is then planned. By researching and working out, the street layout is also developed and established. The total length of the roadway is 497 metres, divided into three segments of 247 metres, 200 metres, and 50 metres.

## 1.1 Index Terms - Methods

1. Collection of Samples
2. Types of Soil Test
3. Construction procedure
4. Graduation test
5. Compaction

## II. INTRODUCTION

### 1.1 General

When applying the same and equivalent traffic load to the pavement, rigid pavements require less thickness than bituminous pavements, making its construction financially feasible:-

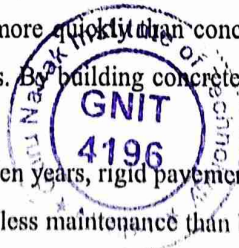
[1]. The biggest drawback of inflexible pavement is that it is more expensive to repair than bitumen roads because the entire concrete slab must be rebuilt when it is damaged. Additionally, because the neighbouring slab panel construction joints serve as a weak plane throughout the portion, the rigid pavement often fails there. Furthermore, it takes 28 days for concrete to reach its maximum compressive strength, which delays the opening of newly built rigid pavements to regular traffic.

[2]. Since it is crucial to ensuring the structural capacity and ride quality of all types of pavements, care should be taken in the design and construction of subgrade and sub-base. Subgrade and sub-base have a significant impact on how well a pavement performs in terms of bearing strength, consolidation, and moisture susceptibility.

[3]. In rainy weather, bituminous surfaces suffer degradation more quickly than concrete surfaces, whereas in dry weather, gravel surfaces become extremely dusty, posing safety and health risks. By building concrete roads, it is simple to solve the issues of dust production and rainy weather damage to roads.

[4]. Unlike bituminous pavement, which has a life span of only ten years, rigid pavements have a lifespan of more than forty years.

[5]. Since concrete is 100% recyclable, rigid pavements require less maintenance than bituminous roads, which currently need to be repaired after being damaged by weather and traffic. Rigid pavements also have a high surface that is resistant to fuel spills from cars.





# “Analysis & Modeling of Deceleration Behaviour of Light Motor Vehicles”

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## Abstract.

Traffic in both developing and established countries is associated with a wide variety of different types of vehicles (HMV & LMV) having properties like physical dimensions and weights, as well as dynamic characteristics, with vehicles moving on any available section of the road capacity with respect to lane discipline. Dynamic traffic leaves a range of marks on road network and has an impact on road conditions (both morphological and structural), resulting in a rise in road traffic accidents. Even though vehicles invariably start alongside during jams which take place at Junctions, travel time (Duration & Distance Headway) for the driver increases as a result of increased traffic intensity at points of intersection. This has an impact on overall cost of the journey even though automobiles always start ahead during jams that occur at Intersections. Traffic simulator should be used to allocate traffic per channel for improved traffic flow. Vehicle deceleration characteristics are crucial for junction design, lane width design, traffic simulation system and vehicular capacity, pollution control and fuel consumption modeling. Vehicles in a homogeneous and heterogeneous traffic stream have a broad variety of physical characteristics like weight, size, hauling capacity and dynamic characteristics, all of which impact their deceleration characteristics by affecting the road characteristics and its behaviour. Previous research has focused on the deceleration behaviour of LMV vehicles (Auto & Bike) in uniform traffic. The goal of this study is to look at how different vehicle (Auto & Bike) decelerate on the Nagpur Katol Naka Highway on the outskirts of Kalmeshwar Town, India. The driver was asked to slow their vehicles from top speed to low velocity in the shortest possible time and the speed patterns were monitored using a GPS. Modeling of dynamic traffic having a multi-agent framework by considering different keywords used for the study, which can be valuable for improving traffic conditions and reducing accidents at Intersections point or junctions. Modal such as single and dual regime modal developed to describe the deceleration behaviour by considering overall speed trajectories. Intelligent transportation can be used to enhance traffic conditions by employing multi-agent systems that can be maintained or employed according to traffic conditions.

54

*Keywords: Single & dual regime model, Speed, Deceleration, Vehicle Characteristics.*

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NeuroQuantology2022;20(16): 5462-5472

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# “EXPERIMENTAL INVESTIGATION OF DIFFERENT SHAPE REFRACTORY FIRE CLAY BRICKS.”

## A Review

Vaibhav C. Pimple<sup>1</sup>, Avinash R. Mankar<sup>2</sup>, Satish S. Markad<sup>3</sup>

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### Abstract:-

World move towards the advance technology because of that demand of energy is increased but source are limited after some year it's big issue for world due in this project we are trying to analysis various combustion furnace and bricks to improve the working condition of the furnace by using different types shape of bricks and material to hold the maximum thermal heat generated by furnace and increasing heat holding capacity of the furnace and compare with present system. the used the different shape hollow bricks, the manufacturing cost very less light in weight and heat holding capacity is little less but compare with all thinks the hollow shape bricks are 12-13% efficient than existing one and life of the fire clay refractories hollow bricks is similar to solid brick.

Key word: - Bricks, heat transfer, fire clay refractories, thermal



*Satish S. Markad*

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# JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

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## Experimentation on Automatic Operated Vehicle Door Glass with Sensor of Engine

A Review

<sup>1</sup>Amit M. Fattig, <sup>2</sup>Narendra N. Wadaskar, <sup>3</sup>Satish S. Markad

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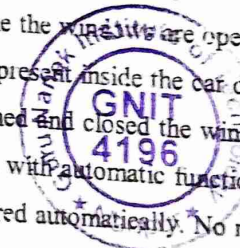
**Abstract:** The today's world is automotive; many more modern technologies are used. Different automatic door locking and window regulating systems are used they are electrically operated as well as mechanically operated Full but some time creates problem when missed out the car key inside the car the interred system is failure. Window regulating sensor is powered with electric motor as a result windows are raised and lowered automatically. No matter what type of a power source is used, window regulating sensors require mechanisms to function. Because, as known mechanisms are basis of all mechanical devices. Hence, different types of mechanisms are utilized resulting different types of window regulating sensor are used. The car engine is switched off and removed out the key from socket. The sensor detects the signals and passes the information to the control circuit provided signal to motor. Due to mechanical link is in working due to window move upward and close the after closed the door window also closed. Implementation of working idea to improve the security of car with minimum operational cast and lower maintenance and effective working condition obtained because of less moving parts.

**Key word:** - Automotive, Window regulator, Sensor, Signal, Mechanism, Automatic

### Introduction

Usage of new generation technologies is becoming an important requirement in these days. These technologies can be used in the security of car to reduce human efforts, personal safety and protect expensive car. Many researchers have proposed various methods of security systems. Each of these systems has its own advantages and disadvantages. One of the important security systems in car is door windows access control. Most doors are controlled manually, especially by security personal that employed by the organization, through the use of handles and locks with key to operate the locks. Examples are banks, hotels, motels and so on; some are controlled by switches while others are controlled by the biometric techniques. These techniques are to enable automatic verification of identification by computer assessment of one or more behaviour and/or physiological characteristics.

Today world is automotive world most of the car are expensive is the part of status. One of the standard properties of cars is the capability to open windows of side doors. As a result, the need of a device that opens windows of car doors arose with the invention of cars. This device which is used to raise or lower the window of the car door is called a window regulator. With the growth of the automotive industry, automotive suppliers spend much effort on the design of window opener mechanism. At first, window regulators are used manually for a long time. But most of the time the windows are open accidentally due to most of car loss or miss most expensive device Like mobile phone laptop and money are present inside the car due to lower security. To improve the security such type of idea to improve the car security user generally opened and closed the window of the door by turning a handle. Later, like other man-powered mechanisms, manual operation is replaced with automatic functioning. Window regulator sensor are powered with electric motors as a result windows are raised and lowered automatically. No matter what type of power source is used, window regulators require mechanisms to function. Because, as known mechanisms are basis of all mechanic devices. Hence,





## Experimental Analysis on Mud Tube Air Conditioning Compare with Existing

<sup>1</sup>Avim Mate, <sup>2</sup>Narendra N. Wadaskar, <sup>3</sup>Satish S. Markad

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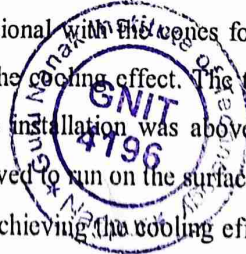
**Abstract:** Day to day due to energy crisis and increasing demand along with its harmful effect to atmosphere, there is serious need of energy saving in air cooling systems. Although, evaporative cooling is well known technique from long time providing best results with applicability in number of areas such as, in residential, commercial, agricultural, and institutional buildings to industrial applications. However, direct evaporation systems lead to increased humidity causing a number of ailments like whereas indirect systems suffer from loss in efficiency. This project test setup is development for performance and evaluation of a mud tube air Conditioning system. This system may also be used as an enthalpy exchanger depending upon the characteristics of prevailing air. Water in the tank is made to drip at a controlled rate into the porous mud tubes that allow capillary action. A thin layer of water formed on the surface of mud tubes is used to exchange sensible and latent heat with the current of outdoor air. This system is highly efficient can save up to 20-30% of high-grade electrical energy and 50% of the water in comparison to it evaporative air cooler. As well as the compared with conventional cooling 7-9 degree temperature reduction is obtained. Fresh and moisture free air is obtained.

**Key word:** - Mud tube, Evaporative, cooling, Heat Transfer, Thermal conductivity, Ecofriendly.

### I. INTRODUCTION

The day by the earth temperature is increased because pollution and deforestation and emission of house gases also increased the demand of energy demand. The analysis of existing cooling techniques, it is found that the installation and running cost of an air conditioner is too high also it emits greenhouse gases which are harmful to environment. In other side the conventional evaporative air cooler is less expensive than air conditioner but it has some limitations in cooling. The use of evaporative cooler makes high humidification with decrease in DBT in closed areas creating stickiness on skin and un-comfort conditions for human being. Present study is focused on improving performance of evaporative cooling system by using mud tube.

The literature-reviewed show that it is needed to optimize the process parameters, which ultimately affect over the performance of the air cooling system. For accomplishment of the present work, after fabrication of the proposed air-cooling system having mud tube will be operated with different day timings and their performance will be compared with conventional evaporative air coolers at the same timings. Further, study will be accomplished by identifying different process parameters and their comparison with conventional air-cooling system to measure the performance. The design was inspired by the structure of a beehive. It used environment-friendly elements to construct an aesthetic piece of art, creating a technique that was functional and visually appealing at the same time. The conceived beehive structure was ready to be functional with the cones forming the desired pattern. The use of cylindrical mud tubes provided for a larger surface area to maximize the cooling effect. The temperature of the air flow around the installation was recorded. It was noticed that the hot air entering the installation was above 50 degrees Celsius at a velocity of 10m/sec. Water recycled from the factory at room temperature was allowed to run on the surface of the cylinders. This process cooled the hot air passing through the earthen pots. It was observed that after achieving the cooling effect, the temperature around the set up dropped down to 36 degrees Celsius while the temperature outside remained high at 42 degrees Celsius. And the air flow was recorded



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## DESIGN AND FABRICATION OF MULTIPURPOSE MATERIAL HANDLING MACHINE WITH OIL COOLING SYSTEM.

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**Abstract** Comfort coupled with safety and simplicity is what man strives for. Our project has been to bring about both. The culmination of our effort has resulted in development of a new "Design & Fabrication of Multipurpose Material Handling Machine". The project present a basic as well as very professional treatment of the subject in a very comprehensive, based on learning effort and understanding capability of today as per their levels. The device is simple and comfortable. Basic calculation, drawing, designing is included in the project. The salient features of our machine can be listed as the mechanism used is very simple, easy for operation; no skill is required to operate the machine. Hydraulic cylinders are used at high pressures and produce large forces and precise movement. For this reason they are constructed of strong materials such as steel and designed to withstand large forces. Because gas is an expansive substance, it is dangerous to use pneumatic cylinders at high pressures so they are limited to about 10 bar pressure. Consequently they are constructed from lighter materials such as aluminum and brass. Because gas is a compressible substance, the motion of a pneumatic cylinder is hard to control precisely.

### INTRODUCTION

The device affords plenty of scope for modifications, further improvements & operational efficiency, which should make it commercially available & attractive. If taken up for commercial production and marketed properly, we are sure it will be accepted in the industry. Cylinders are linear actuators which convert fluid power into mechanical power. They are also known as JACKS or RAMS. Hydraulic cylinders are used at high pressures and produce large forces and precise movement. For this reason they are constructed of strong materials such as steel and designed to withstand large forces. Because gas is an expansive substance, it is dangerous to use pneumatic cylinders at high pressures so they are limited to about 10 bar pressure. Consequently they are constructed from lighter materials such as aluminum and brass. Because gas is a compressible substance, the motion of a pneumatic cylinder is hard to control precisely. The basic theory for hydraulic and pneumatic cylinders is otherwise the same. Material handling equipment is mechanical equipment used for the movement, storage, control and protection of materials, goods and products throughout the process of manufacturing, distribution, consumption and disposal. The different types of handling equipment can be classified into four major categories. Transport equipment, positioning equipment, unit load formation equipment, and storage equipment. The major subcategories of transport equipment are conveyors, cranes, and industrial trucks. Material can also be transported manually using no equipment

A hydraulic system employs enclosed fluid to transfer energy from one source to another, and subsequently create rotary motion, linear motion, or force. The power unit/pack provide the power needed for this transfer of fluid.

Unlike standard pumps, hydraulic power units use multi-stage pressurization networks to move fluid, and they often incorporate temperature control devices. The mechanical characteristics and specifications of a hydraulic power unit dictate the type of projects for which it can be effective.

Some of the important factors that influence a hydraulic power unit's performance are pressure limits, power capacity, and reservoir volume. In addition, its physical characteristics, including size, power supply, and pumping strength are also significant considerations. To better understand the operating principles and design features in a hydraulic power unit, it may be helpful to look at the basic components of a standard model used in industrial hydraulic systems.

### Hydraulic Power Pack/Unit Design Components

A large, durable hydraulic power unit built for functioning under a range of environmental conditions with numerous design characteristics distinct from a typical pumping system. Some of the standard design features include:

- **Accumulators:** These are containers that can be attached to the hydraulic actuators. They collect water from the pumping mechanism and are intended to build and maintain fluid pressure to supplement the motor pumping system.



*Shrike*  
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# EFFECT OF MAGNESIUM OXIDE NANOPARTICLE ON THERMAL STABILITY OF PMMA- MGO COMPOSITE FOR TECHNOLOGICAL APPLICATIONS

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**Article History: Received: 01.06.2023    Revised: 22.06.2023    Accepted: 24.07.2023**

## Abstract

Due to their unique chemical stability, high photo catalytic activity, high electric permittivity, and non-toxic nature, metal oxide nanoparticles are used in a wide range of optical, electrical, electronic, biomedical, environmental, and catalytic devices. The current research is focused on developing a nanocomposite of polymethyl methacrylate and magnesium oxide by first synthesising MgO nanoparticles and then treating them with the polymer. Infrared spectrophotometer for determining functional groups, thermogravimetric and differential thermal analyzers for determining thermal stability, scanning electron microscopy for morphology and refractometer, and so on have all been used to characterise the synthesised PMMA-MgO nanoparticle composite. In our research for new uses, we found that adding MgO to PMMA speeds up the reaction and cuts the synthesis time in half, from 40 minutes to 15 minutes. The role of MgO as catalysts has thus been established.

**Key words:** PMMA (Polymethyl methacrylate), MgO nanoparticle, FTIR Spectrophotometer, Scanning electron microscope, Thermogravimetric analysis, differential thermal analysis and Refractive index.

## 1. INTRODUCTION

Nanoparticles made of metal oxides are being studied extensively because of their many desirable characteristics. This means they have several uses, including in coatings, catalysts, antibacterial medicine, sensors, semiconductors, capacitors, and batteries. Catalysis, hazardous waste

cleanup, paint, superconducting goods, and anti-bacterial actions against food-borne pathogens are just few of the various uses for magnesium oxide (MgO).[2]

The area of materials science has paid a lot of attention to polymer-inorganic oxide nanoparticle composites due to their superior characteristics compared to those



*Shake*

**DESIGN AND MODIFICATION OF MECHANISM FOR POTATO CHIPS CUTTING**

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**Abstract:**

The risk of food-borne illnesses rises when potatoes are chopped by hand since it takes longer and increases the possibility of food contamination. Automatic machines have become a necessity in today's industrialized world, helping to cut down on the time and effort needed to execute particular activities. However, there are considerable drawbacks to the current potatoes cutting machines, including their high initial investment costs, contamination hazards, and the extra labor and processing time needed for manual processing. To mitigate these problems, a potato chip slicing device design is developed utilizing components that are easily accessible in the area, such as mild steel and stainless steel. The system includes a hopper configuration, and pressing the potatoes is done effortlessly thanks to a spring-loaded pressure block. The potatoes are sliced into chips using an electric device with a spinning blade. The main goal of this research is to develop a slicing device that can operate in small- to medium-sized manufacturing facilities without the high costs and other drawbacks of manual processing. A potato chips cutting machine discusses the creation of a specialized device for efficiently slicing potatoes into uniform chips. The machine's design incorporates safety features, precise cutting mechanisms, and automation to enhance productivity. The resulting potato chips cutting machine aims to meet the demand for consistent and high-quality chips production while ensuring user safety and ease of operation.

**Keywords:** Potato, circular Cutting Blade, portable, design.

**Introduction:**

India is a significant potato producer, with Uttar Pradesh accounting for 31.26% of the total output. Despite the widespread use of potato chips, Maharashtra lacks small-scale processing enterprises since cutters and slicers for processing potatoes are expensive and inefficient. The farmers can build their own home- or business-based potato-slicing and frying equipment to boost productivity and income [1]. Potatoes are shrunk mechanically without changing their chemical composition, resulting in homogeneity in the size and shape of the finished product. Cast iron and mild steel are frequently utilized for fabrication, and manual machines are created for places without power. An everyday carbohydrate is potatoes, which are also frequently consumed as chips while traveling



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# Flow Stress Modeling of Tube and Slab Route Sheets of Zircaloy-4 Using Machine Learning Techniques and Arrhenius Type Constitutive Equations



Journal of Materials Engineering and Performance

Technical Article | Published: 12 August 2022

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## Abstract

The present work examines the effectiveness of a strain-compensated Arrhenius-type constitutive model, Artificial Neural Network (ANN) and Support Vector Regression (SVR), to predict the flow stress in tube route and slab route Zircaloy-4 sheets at elevated

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Pankaj Wankhede <sup>a</sup>, Nara Guru Narayanaswamy <sup>b</sup>, Suresh Kurra <sup>a</sup>, Amrita Priyadarshini <sup>a</sup>

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## Abstract

Prototyping with incremental sheet forming is becoming the newest trend in the manufacturing industry due to its flexibility and low cost for generating customized components based on client needs. The main goal of this paper is to minimize the manufacturing time, surface roughness, and forming force requirement in the incremental

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Sadaf Gauhar M. Mushtaque, V. B. Pawade & S. J. Dhoble

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## Abstract

This article reported the photoluminescence properties of a rare-earth (RE; Eu<sup>3+</sup>, Dy<sup>3+</sup>, Sm<sup>3+</sup>, Ce<sup>3+</sup>)-doped BaSr<sub>2</sub>(PO<sub>4</sub>)<sub>2</sub> phosphor. A series of rare-earth (RE; Eu<sup>3+</sup>, Dy<sup>3+</sup>, Sm<sup>3+</sup>, Ce<sup>3+</sup>)-doped BaSr<sub>2</sub>(PO<sub>4</sub>)<sub>2</sub> has been synthesized by a wet chemical method. The SEM images

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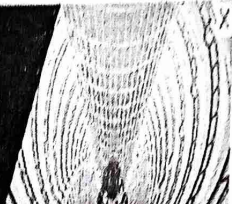
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## Optical and thermal properties of rare earth-doped $K_4Ca(PO_4)_2$ phosphor

Sadaf Gauhar M. Mushtaque, Vijay B. Pawade, Sanjay J. Dhoble

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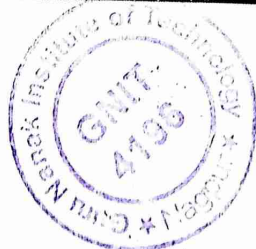
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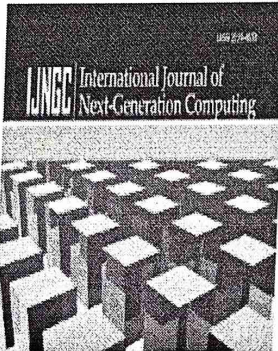


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### Blockchain Technology: Growing Usecases and Issues to Tackle



Volume 13, Special Issue 5, November 2022

**Firdous Sadaf M. Ismail**

Shri Ramdeo Baba College of Engineering and Management, affiliated to Rashtrasant Tukadoji Maharaj Nagpur University

**Dattatraya S Adane**

Shri Ramdeo Baba College of Engineering and Management

#### Abstract

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# Academic year

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# Constructed Wetlands –Lake Water Treatment Using Aquatic Plants

Mr. Pankaj Prasad<sup>1</sup>, Mr. Lokesh Sonde<sup>2</sup>, Mr. Mukul Bawane<sup>3</sup>, Mr. Mohd. Atir Tanveer Abid<sup>4</sup>,

Mr. Hrishikesh Mishra<sup>5</sup>, Prof. Sushant M. Gajbhiye<sup>6</sup>

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**ABSTRACT-** Constructed wetlands are engineered and managed wetland systems that are increasingly receiving worldwide attention for wastewater treatment and reclamation. Compared to conventional treatment plants, constructed wetlands are cost-effective and easily operated and maintained, and they have a strong potential for application in a small community. Constructed wetlands for wastewater treatment have substantially developed in the last decades. As an eco-friendly treatment process, constructed wetlands may enable the effective, economical, and ecological treatment of agricultural, industrial, and municipal wastewater. Due to water scarcity challenges around the world, it is essential to think about non-conventional water resources to address the increased demand in clean freshwater. Environmental and public health problems may result from insufficient provision of sanitation and wastewater disposal facilities. Because of this, wastewater treatment and recycling methods will be vital to provide sufficient freshwater in the coming decades, since water resources are limited and more than 70% of water are consumed for irrigation purposes. Therefore, the application of treated wastewater for agricultural irrigation has much potential, especially when incorporating the reuse of nutrients like nitrogen and phosphorous, which are essential for plant production. Among the current treatment technologies applied in urban wastewater reuse for irrigation, wetlands were concluded to be the one of the most suitable ones in terms of pollutant removal and have advantages due to both low maintenance costs and required energy. Wetland behavior and efficiency concerning wastewater treatment is mainly linked to macrophyte composition, substrate, hydrology, surface loading rate, influent feeding mode, microorganism availability, and temperature. Constructed wetlands are very effective in removing organics and suspended solids, whereas the removal of nitrogen is relatively low, but could be improved by using a combination of various types of constructed wetlands meeting the irrigation reuse standards. The removal of phosphorus is usually low, unless special media with high sorption capacity are used. Pathogen removal from wetland effluent to meet irrigation reuse standards is a challenge unless supplementary lagoons or hybrid wetland systems are used. In this paper Futala Lake, Nagpur lake water treatment using Hydrilla Submerged Aquatic plants.

**KEYWORDS-** Hydrilla, Lake Water, Submerged Plants, Constructed Wetlands, Wastewater Treatment

## I. INTRODUCTION

### 1.1 OVERVIEW

Globally, most of the developing countries are geographically located in those parts of the world that are or will face water shortages in the near future. Moreover, the existing water sources are contaminated because untreated sewage and industrial wastewater is discharged into surface waters resulting in impairment of water quality. The treatment of wastewater using Constructed Wetland (CW) is one of the suitable treatment systems, used in many parts of the world. Wetlands are defined as land where the water surface is near the ground surface long enough each year to maintain saturated soil conditions, along with the related vegetation. Marshes, bogs, and swamps are all examples of naturally occurring wetlands.

*As stated by Ramsar Convention*, natural wetlands are those "areas of marsh, fen, peat-land or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters."



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## “Modeling Of Acceleration Behaviour Of Light Motor Vehicles”

**Mr. Sushant M. Gajbhiye** Ph.D Scholar, Veda Institute of Technology (RKDF University), Bhopal (MP), India. [sushant20011986@gmail.com](mailto:sushant20011986@gmail.com)

**Dr. Arun Patel** Professor, <sup>2</sup>Professor, Veda Institute of Technology (RKDF University), Bhopal (MP), India. [arunpatel123@gmail.com](mailto:arunpatel123@gmail.com)

### Abstract

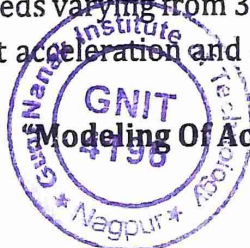
Emerging as well as developed countries, traffic is characterized by a wide range of physical dimensions weights, dynamic characteristics with vehicles driving on any accessible area of the road space without regard for lane discipline. Dynamic traffic generates a variety of stains on road infrastructure, as well as affects road conditions (both structural and surface), which contributes to an increase in road accidents. Due to excessive traffic, jam density at intersection points, travel time (Time & Distance Headway) for the driver increases, which affects the overall cost of the journey because vehicles always start in place during jams that occur at Junctions. For better traffic flow, traffic simulation should be used to distribute traffic per lane.

The study and modeling of dynamic traffic having a multi-agent framework is the topic of this essay. Different keywords have been considered for the study, which can be valuable for improving traffic conditions and reducing accidents at intersections or crossings. For the distribution and analysis of traffic a vehicle characteristics and geometric design is considered. The researcher employed various types of modal such as single regime linear and dual, polynomial, and exponential modal. Intelligent transportation can be used to enhance traffic conditions by employing multi-agent systems that can be maintained or employed according to traffic conditions.

**Keywords:** Speed, Acceleration, Driver Behaviour, Geometric Design, Vehicle characteristics.

### 1. Introduction

The basic aspect which a person is used to in his daily life is traffic. There seem to be different types of trip such as (Residence, Workplace, Enjoying, Job etc.) the person use in his routing. It is crucial for him to achieve their aim. Several types of vehicles are used for transportation, depending on the driver safety and comfort. As per to their traffic intensity and movement capacity, heterogeneous and homogeneous traffic situations are frequent. These vehicles reach speeds varying from 30 to 100 kilometre per hour. Several types of vehicles possess different acceleration and deceleration attributes. Vehicles do





# An Attempt For Comparing Different Techniques Of Image Fusion

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**Dr. Vijay Prakash Singh** Research Supervisor, Department of Electronics & Communication Engineering, Sri Satya Sai University of Technology & Medical Sciences, Sehore, M.P., India.

**Dr. Sudhir N Shelke** Research Co-Supervisor, Department of Electronics and Communication Engineering & Principal, Guru Nanak Institute of Technology, Nagpur.

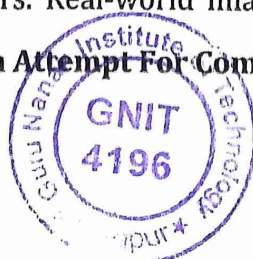
## ABSTRACT

The goal of image fusion is to create an output picture that is more informative and valuable than any of the individual input images by combining information from all of the input photos. It raises the bar for how useful and accurate data may be. The quality of the resulting merged image changes with each use. Stereo camera fusion, medical imaging, monitoring production processes, electrical circuit design and inspection, sophisticated machine/device diagnostics, and intelligent robots on assembly lines are just few of the many applications of image fusion. Image filtering is one of the most fascinating uses of image processing. Size, shape, colour, depth, smoothness, etc. may all be tweaked with picture filtering. The basic idea is to use some kind of graphic design and editing software to manipulate the image's pixels until you get the result you want. This paper provides an overview of the many uses of image filtering methods.

**Keywords:** -Image, Techniques. Fusion, Objects, Application

## **I. OVERVIEW**

To improve photos or create automated systems, researchers have been studying how to extract meaningful information from limited-capture still photographs and movies for decades. The processing of more complicated real-world scenarios, such as those with noise in data, rapid motion or lighting fluctuation, non-rigid or articulated movement of objects, backdrop variation, etc., has become necessary due to the rising need for intelligent automated systems in recent years. Real-world image sequences are processed in most





## Design And Simulation Of Optical Code Converters

**Dr. A. S. Rathore** Research Guide, Department of Electronics & Communication Engineering, Sri Satya Sai University of Technology & Medical Sciences, Sehore, M.P.

**Arun G** Research Scholar, Department of Electronics & Communication Engineering, Sri Satya Sai University of Technology & Medical Sciences, Sehore, M.P.

**Dr. Sudhir N Shelke** Principal, Guru Nanak Institute of Technology, Nagpur.

### ABSTRACT:

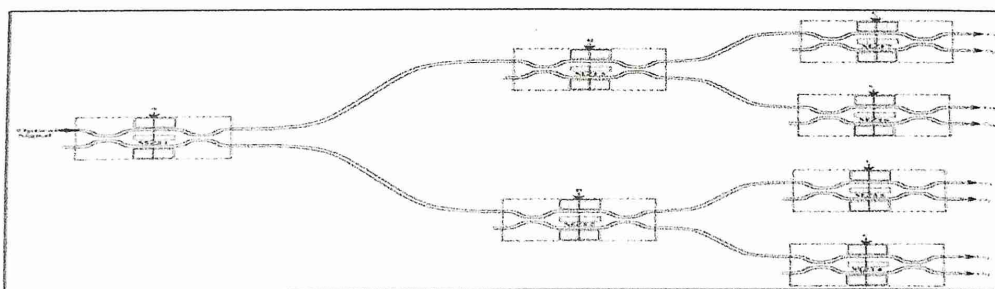
The applications that need high-speed decoding/encoding, optical packet routing/switching, ultra-fast computation, and code conversion look poised to benefit from this new optical technology. There was a proposal for an optical decoder and encoder in the prior chapter. One of the benefits of signal (optical) processing is the range of analysis options it gives. It is impossible to create optical parts without optical logic gates. In this article, design and simulation of optical code converters has been discussed.

**Keywords:** Optical, Code, Converters, Boolean

### INTRODUCTION:

The conversion from binary to octal (B-O) is seen in Figure. In this case, seven MZIs are employed to create the B-O converter. On MZI1's first input terminal, an optical CW signal is applied. Input terminal one of MZI3 and MZI2 are connected to the output terminals (1 and 2) of MZI1.

### Design of Binary to Octal Code Converter:



**Figure 1. Conceptual diagram of binary to octal code converter using MZIs**

# Failure Mode and Effect Analysis of Transmission Case of a Tractor

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**Dr. Nandkishor M Sawai**

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**Mr. ShadabKhan Pathan**

Guru Nanak Institute of Technology, Nagpur, Maharashtra, India,

**Abstract** – A failure mode and effects analysis (FMEA) performed to enhance the transmission case manufacturing process of a tractor. The literature on transmission case process failure mechanisms, failure effects, and failure causes was reviewed. The most important failure modes were ranked according to a comprehensive analysis of the transmission case procedure. On a radial drilling machine, the rejection/failure rate was highest following spot facing and back spot facing operations. Contributing variables associated with failure modes, failure causes, failure impacts, and preventative strategies to mitigate the probability of failure..

**Index Terms** - Back spot facing, Failure mode and effect analysis, Spot facing, Transmission case

## 1. INTRODUCTION

A transmission for a tractor that includes a transmission case with an opening that is made in a side wall of the transmission case and opens to the outside of the transmission case. The transmission is a speed-changing mechanism installed in the transmission case that delivers power from a tractor's engine to the driven wheel. A speed change device is comprised of a primary speed change device that can vary the speed of driving force from the engine to a number of speeds.

FMEA is an effective method for organizing an investigation of a complex product or system, detecting possible issues, and resolving the most severe failures. The definition of failure is "the inability to function in accordance with the process purpose." Failure modes, failure impacts, failure causes, determining which failures should be handled first, and selecting preventative actions to decrease the probability of failure are all components of the general analysis process..

## 2. FMEA OF A TRANSMISSION CASE

A simplified variant of a process FMEA was applied to the transmission case based on the process engineer's advice and subject-matter expertise. The goal of the study was to identify transmission case issues, rank them in order of severity, and then examine the most significant failure. In this study, "Transmission Case" refers to the tractor shown in figure 1 as including a speed change mechanism that transfers driving force from a tractor's engine to a driven wheel.



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# Measurement

Volume 187, January 2022, 110273



## A low cost surface strain measurement system using image processing for sheet metal forming applications

Pankaj Wankhede<sup>a</sup>, Sriram Kodey<sup>a</sup>, Suresh Kurra<sup>a</sup>, Sudha Radhika<sup>b</sup>

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Research Article

# Heat treatment and temperature effects on formability of AA2014-T6 in incremental forming

Pankaj Wankhede, Mahesh K, Suresh Kurra & Swadesh Kumar Singh

Pages 1384-1392 | Received 11 Aug 2021, Accepted 03 Dec 2021, Published online: 29 Dec 2021

Cite this article | <https://doi.org/10.1080/10426914.2021.2016813> Check for updates

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## ABSTRACT

Aluminum alloys of various series are used extensively in the auto and aviation sectors because of their low weight to strength ratio. In the current article, one of the hard-to-

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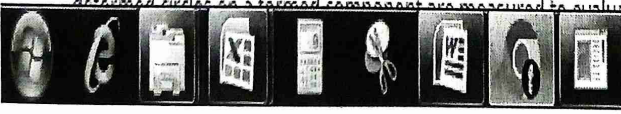
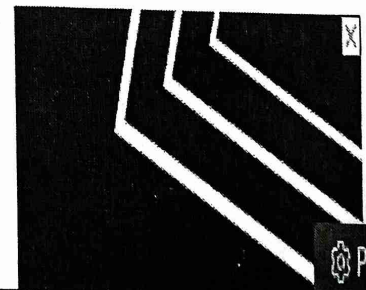
[Pankaj Wankhede](#) [K Mahesh, \(...\)](#) and [Nitin Kotkunde](#) [View all authors and affiliations](#)

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### Abstract

Strain analysis is an important step in sheet metal forming operations to identify the potential locations of failure. Circle grid analysis is a widely used method to evaluate the strains in sheet metal forming, where deformed circles on a formed component are measured to evaluate the strains at different locations. In this



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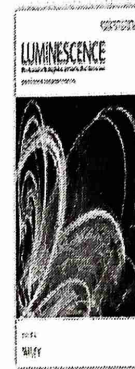
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RESEARCH ARTICLE

## Energy transfer process in a rare earth (Ce<sup>3+</sup>, Dy<sup>3+</sup>, Sm<sup>3+</sup>)-doped nanocrystalline phosphate phosphor

Sadaf Gauhar M. Mushtaque, V. B. Pawade, S. J. Dhoble

First published: 11 April 2022 | <https://doi.org/10.1002/bio.4254>

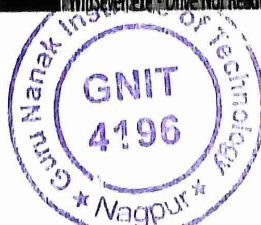


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# Academic year

## 2020-21

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## “EXPERIMENTAL INVESTIGATION OF HEAT TRANSFER ENHANCEMENT FOR USING DIFFERENT ARRANGEMENT OF RECTANGULAR FIN”

Ashish Sontakke<sup>1</sup>, Prof. Narendra Wadaskar<sup>2</sup>

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<sup>1,2</sup>Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur.

\*\*\*

**Abstract:** In many engineering situations the equipment are placed at different geographical locations which are not accessible to regular maintenance and which requires cooling of the surfaces continuously and natural/free convection heat transfer process is preferred for this applications. Natural Convection is one of the major modes of heat transfer that can be classified in terms of being natural, forced, gravitational, granular, or thermomagnetic. In the past decade, several studies on convection heat transfer in much geometry, enhancement of heat transfer by adding narrow strip (fin), effects of magnetic field in heat transfer, heat transfer in a porous medium have been reported. The effects of Prandtl (Pr), Reynolds (Re), Grashof (Gr), and Rayleigh numbers (Ra), fin length, fin height, fin spacing and their orientation have also been investigated. This paper reviews various researchers work on fluid flow and heat transfer behaviour which is carried out by means different types of fin attachments, their orientation & angle of inclination of base plate

### Nomenclature:-

g – acceleration due to gravity

$\beta$ - Dimensional parameter

S- Characteristic length

$\theta$ - Inclination of fins

Ra- Rayleigh No.

Pr- Prandlt No.

h – Heat transfer coefficient

Ab- Area of Base plate

Af – Area of Fin

w- Width of fin

### 1. Introduction

Natural convection occurs when the fluid circulates by virtue of the natural differences in densities of hot & cold fluid; denser portion of the fluid moves downwards because of greater force of gravity, as compared with the force on the less dense. Heat transfer by natural convection between a system and surrounding can be increased by using an extended thin strip of metal called fin. Fins are used where available surface is found inadequate to transfer the required quantity of heat with the available temperature drop and where heat transfer coefficient is low. The selection of fin depends on different parameters like geometrical shape, fin spacing, fin height, base thickness, kind of material, surface finish etc. There are different fin geometries like uniform straight fin, annular fin, splines, pin fin etc. are used to increase the heat transfer rate from surface. Fins orientation and geometry of fins array are the main parameters which affects the enhancement ratio of heat transfer. S. V. Kadbhane et al [1] developed an experimental set up to test 25 different fin arrays. Natural convective heat transfer from rectangular vertical fin array can be enhanced by optimizing the geometrical parameters such as fin length, width, height, and spacing. It was found that natural convective heat transfer rate first increases with increase in spacing upto certain limit, reaches to maximum at a certain value of spacing i.e. at an optimum value of spacing and then decreases with further increase in spacing, and For present study value of optimum fin spacing was found between 9mm to 11mm. Sk. Farooq et al [2] studied the variation of convective heat transfer coefficient and the base temperature of fins

# “Experimental Investigation on Heat Transfer Enhancement by Using Protrusion Patterned Surface”

## ABSTRACT

*Dimples play a really important role in heat transfer enhancement of electronic cooling systems, heat exchangers, etc. This work mainly deals with the experimental investigation of forced convection heat transfer over circular & oval-shaped dimples of various diameters on a flat copper and aluminum plate under external streamline flow conditions. Experimental measurements on heat transfer characteristics of air (with various inlet flow rates) on a flat plate with dimples were conducted. From the obtained results, it had been observed that the warmth transfer coefficient and Nusselt number were high for the copper plate during which the diameter of dimples increases centrally within the direction of flow.*

**Keywords:** - Heat Transfer, Circular Shape, Laminar Flow, Dimples Shape (Cashew & Capsule)

## 1. INTRODUCTION

The maximum temperature of the component is one among the most factors that control the reliability of electronic products. Thermal management has always been one among the most issues within the industry, and its importance will grow within the coming decades. The utilization of warmth sinks is that the commonest application for thermal management in electronic packaging. Conductor performance are often evaluated by several factors: material, area, the flatness of contact surfaces, configuration, and fan requirements. Although there are a couple of investigations for the utilization of dimples under laminar airflow conditions, there exists no experimental data with reference to the utilization of various dimple shapes for warmth sink applications. Therefore, this study evaluated the warmth transfer characteristics using two different dimple shapes on a conductor fin by experimental methods: 1) Circular dimples, and 2) Oval dimples.

The conventional heat transfer enhancement approaches to extend either the warmth transfer rate or the turbulence of fluid stream, generally, it involves the incorporation of fins, baffles, turbulizers and etc. Although, these approaches are an efficient method to enhance the warmth transfer performance; however, the rise of fluid stream pressure drop should worry. The dimpled surface is one among the effective methods to enhance the warmth transfer rates without a big pressure drop. Normally, the dimpled surface generates the vortex flow within its hole and therefore the augmentation of warmth transfer is obtained. [1]

Enhancement techniques can be separated into two categories: Active and Passive.

### A. Active Method

This method involves some external power input for the enhancement of warmth transfer. Some samples of active methods include mechanical aids, surface vibration, fluid vibration, electrostatic fields, suction or injection, and jet impingement requires an external activator/power supply to cause the enhancement

### B. Passive Method

This method generally uses surface or geometrical modifications to the flow channel by incorporating inserts or additional devices. For instance, inserts extra component, swirl flow devices, treated surface, rough surfaces, extended surfaces, displaced enhancement devices, coiled tubes, physical phenomenon devices and additives for fluids

### C. Compound Method

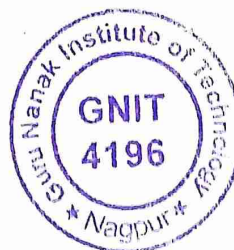
If two or more techniques are often utilized simultaneously to supply an enhancement larger than that produced by just one technique than it are often said as Compound Method. A compound method may be a hybrid method during which both active and passive methods are utilized in combination. The compound method involves the complex design and hence has limited applications.

## VORTEX HEAT TRANSFER TECHNIQUE

Each dimple acts as a “Vortex Generator” which provides an intensive and stable heat and mass transfer between the dimpled surface and gaseous heating/cooling media. Taking advantages of vortex heat transfer enhancement (VHTE), as

- a) Higher heat transfer coefficient
- b) Negligible pressure drop penalty
- c) Potential for fouling rate reduction
- d) Simplicity in design and fabrication
- e) Compactness and/or lower cost

This method is potentially used in heat transfer enhancement in convective passages for industrial boilers, process heaters, furnaces, heat exchangers and variety for other industries like automotive (radiators, oil coolers etc.), heat treating (recuperator), aerospace, military, food processors etc.



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## SOLAR POWER SAND FILTER

<sup>1</sup>Dr .N. N. Wadaskar, <sup>2</sup>Prof. S. S. Markad, <sup>3</sup>Anita D. Meshram

<sup>1</sup>Dr. N.N. Wadaskar, Guru Nanak Institute of Technology, Heat & Power

<sup>2</sup>Prof. S. S. Markad, Guru Nanak Institute of Technology, Heat & Power

<sup>3</sup>Anita D. Meshram, Guru Nanak Institute of Technology, Heat & Power

**Abstract** – Filtration is commonly the mechanical or physical or OPERATRION which is used for the separation of solids form fluids ( liquids or gases ) by interposing a medium through which only the fluid can pass. The fluid that passes through is called a filtration. Oversize solids in the fluid are retained, but the separation is not complete; solids will be contaminated with some fluid and filtrate will contain fine particles (depending on the pore size and filter thickness.) filtration is also used to describe some biological processes, especially in water treatment and sewage treatment in which undesirable constituents are removed by absorption into a biological film grown on or in the filter medium as in slow and filtration. Actually all filter machines is available in market are hand operated and fuel operated but by making this solar power sand filter we save fuel as well as the human art work. This is a research topic and more development is required in this project. This is totally non-conventional energy operated project.

**Key Words:** concentrated solar power, thermal energy storage, heat transfer fluid.

### 1.INTRODUCTION

Actually all filter machine is available in market are hand operated and fuel operated but by marketing this solar power sand filter we save fuel as well as the human art work. This is research topic and more development is required in this project. Sand is a naturally occurring granular material composed of finally divided rock and mineral particles. The composition of sand is highly variable, depending on the local rock source and conditions, but the most common constituent of sand in inland continental settings and non-topically coastal setting is silica( silicon dioxide, or SiO<sub>2</sub>), usually in the quartz. In different size granules and all required filtration and we make that filter plan of sand.

The second most common type of sand is calcium carbonate, for example aragonite, which has mostly been created, over the past half billion years, by various forms of life, like coral and shellfish. It is, for example, the primary form of sand apparent in areas where reefs have dominated the ecosystem for millions of years like the Caribbean. The use of alternative to river sand is increasing with the ban on sand mining. General decline in the availability of river sand, and pressure from active environmental groups to protect nature.

### 2. Literature Survey

If we get to the literature study of the sand filtration. we could able to understand the importance of the sand filtrations as terrifically increased as per the increasing demand of the mankind

If we compare today condition with the condition regarding 5 years later, we could able to see the increasing graph of the sand filtration regarding its cost and increasing demand. The prize of 1 brass of sand filtered in 2009 were 150 Rs/brass. Now due to the increasing demand of the sand it has been increased terrifically to 2000 Rs/brass.

The raise in the prize is not only due to the demand, but due to the machinery filtration the quality of sand as also been increased. Later on the sand was directly taken from the sea or a river site for the use and later it is been purified and used for a particular purposes. Now a days the sand is been filtered on the same site which consequently raises the total cost for the needer.

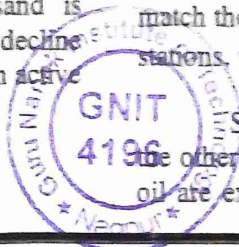
The machine worked for the purification of sands generally work on a diesel basis which is terms also increases the total cost to the needer. For each machine, the requirement of the diesel is about 250 litre/ day with includence of the diesel transportation. Which exactly coses 15000 Rs/day. And this all the filtered sand is been highly transfer to the mega cities like dubie, Singapore via sea ways.

So this project clearly shows the innovative technique with the idea of the prize losses again the filtration of sand and the profit regarding to it.

### 3. Problem definition:

Solar panels can be expensive to install resulting in time-lag of many years for saving on energy bills to match initial investment. Electricity generation depends on countries exposure to sunlight, this could be limited by a countries climate. Solar power stations do not match the power out of similar sized conventional power stations, they can also be very expensive to build.

Solar cells make absolutely no noise at all. On the other hand, the giant machines utilized for pumping oil are extremely noisy and therefore very impractical of





# Design and Modification in Go-Kart

Prof. Satish Markad<sup>1</sup>, Ankush Pradhan<sup>2</sup>, Kiran Bante<sup>3</sup>, Monali Unre<sup>4</sup>, Pritish Kohale<sup>5</sup>, Priyankesh Vibhakar<sup>6</sup>,  
Vrushabh Moharkar<sup>7</sup>

<sup>1,2,3,4,5,6,7</sup>(Currently pursuing Mechanical Engineering degree at Guru Nanak Institute of Technology, Kalmeshwar road, Nagpur, Maharashtra, India-441501)

**Abstract:** A Go-kart is a small four wheeled vehicle. Go-kart, by definition, has no suspension and no differential. They are usually raced on scaled down tracks, but are sometimes driven as entertainment or as a hobby by non-professionals. In this paper a go-kart has been designed, simulated, fabricated and tested for probable feasibility for undergraduate students to explore different aspect of vehicle and develop their own go-kart. This paper concentrates on explaining the design and engineering aspects of making a Go Kart for student karting championship 2020.

**Keywords:** Chassis, steering system, Braking system, Innovation, Engine, Transmission.

## I INTRODUCTION

The first kart manufacturer was an American company, Go Kart Manufacturing Co. (1938). In 1959, McCulloch was the first company to produce engines for karts. Its first engine, the McCulloch MC-10, was an adapted chainsaw 2-stroke engine. Later, in the 1960s, motorcycle engines were also adapted for kart use, before dedicated manufacturers, especially in Italy (LAME), started to build engines for the sport.

There are many motor sports in the world. Bike, cars, formula one is examples of them. The drivers in these are very professionals and accurate. They can drive it very fast. But there are also motor sports which do not need professional drivers and need no great speed. The vehicle used are very cheap. Such a motor sport is Go-Karting. They resemble to the formula one cars but it is not faster as find also cost is very less. The drivers in go karting is also not professionals. Even children can also drive it. Go-Karts have four wheels and a small engine. They are widely used in racing in US and also, they are getting popular in India.



Fig. Go-Kart

## II LITERATURE REVIEW

Ref prof. S.R. Satish Kumar and prof. A.R. Santha Kumar - Trusses are triangular frame works, consisting of essentially axially loaded members which are more efficient in resisting external loads since the cross section is nearly uniformly stressed. They are extensively used, especially to span large gaps.

Trusses are used in roofs of single storey industrial buildings, long span floors and roofs of multi-storey buildings, to resist gravity loads. Trusses are also used in walls and horizontal planes of industrial buildings to resist lateral loads and give lateral stability.

## III DESIGN ELEMENTS OF KART

### A. Chassis

A chassis is one of the most important components of a vehicle, without which the car would have no structure. It is the canvas in which the final construction of the vehicle is placed upon.



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# Review on Solar Tree with Wind Turbine

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## Abstract:

Energy is important to the economic process and social development of any country. Indigenous energy resources important to be developed to the optimum level so attenuate dependence on foreign fuels, subject to partitioning economic, environmental and social constraints. This is important to a lift in analysis and development likewise as investment in renewable energy business in search of how to satisfy energy demand and to cut back dependency on fossil fuels. Wind and solar power are getting standard due to abundance, handiness and simple harnessing for electric power generation. Reaching the non electrified rural population is presently unfeasible through the extension of the grid, since the affiliation is neither economically possible. Further, there will be increase in oil costs, and also the intolerable impacts of this energy supply on the users and on the surroundings, square measure slowly removing standard energy solutions, like fuel gents based mostly systems, from the agricultural development agendas, "Hybrid Power Generation" ie. Solar and wind based energy generation. This paper presents the design of hybrid electricity generation system by utilizing both solar and wind renewable energy to the domestic household in the remote area which is unable to connect to the grid. Hybrid systems have tested to be the most effective choice to deliver, "high quality" power.

**Keywords:** Solar Panel, Solar Tree, Wind Turbine.

## I. INTRODUCTION

Solar Energy is accepted as a key resource for the future of the world. The utilization of solar energy could cover a significant part of the energy demand in the countries. One of the most popular example of utilized solar energy that is solar tree. In this paper illustrates the various review about the solar tree and development of Solar Tree for domestic application considering the average requirement of small Indian house. Therefore, in this paper, an attempt has been taken to summarize the past and current research in the field of solar tree technology. The main objective of this paper is to present the review about the solar tree. In the world the utilization of energy is increasing day by day and therefore we required the renewable energy sources which are pollution free and easily available like sun light. Sun light is utilized by solar panels but when we required an array of panels the land requirement also increases which arises as a problem. For solution of this problem and for getting more energy we use solar trees. In these trees basically there are solar panels which are arranged in Fibonacci series for getting more energy and the requirement of the land is less. Because of less requirement these are easily installed and these can be used in straight lighting, home supplies and in industries etc. The sun light easily available so these are very beneficial there is no worry of availability of sun light in future because till the end of the world this is also available. Meaning of the TREE in Solar Trees

T= Tree generating

R= Renewable

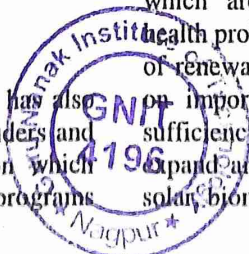
E= Energy and

E= Electricity

Rein Trifled is a solar environment a list artist that has also begun to construct solar trees. He is one of the founders and the current president of the Solar Tree Foundation which began in 2008. The Solar Tree Foundation designs programs for elementary school students to show them the creative process for constructing a Solar Tree in order to educate a broad audience on the environmental and technological material. It's also designed with the intention of instilling an appreciation for artistic aesthetics interpreted through sculptures as a medium of expression. This is performed by online lectures and webcams in which the students can engage with the architects and see the construction process in real time. Trifled believes that his Solar Trees will help preserve natural trees in the long run. The latest solar tree constructed by the Solar Tree Foundation was erected for North Hillsborough Elementary School in Hillsborough California. At peak efficiency, the 10,000 lb. Solar Tree is claimed to produce 20,000 watts of energy per day.

## Wind:

Energy demand is a key factor in the economy of a country. The energy demand in India increased rapidly to an average of 6.4% during 1990–2010, thanks to the significant economic growth in this period. As a consequence of this drastic increase in energy demand, the conventional sources of energy are depleting very fast. An ill-effect of usage of conventional energy sources to meet the demand, is the loss to environment and public health. The result of pollution like global warming, skin cancer, etc., has forced the scientific community all over the world to focus on alternative source of energy which can be renewed and should cause considerably less damage to the environment. Use of renewable energy sources results in less emission of greenhouse gases and other harmful gases such as SO<sub>2</sub>, different oxides of nitrogen and by-products of fossil fuel which are responsible for the environmental degradation, health problem etc. The continuous attention and increased use of renewable energy may restrict the dependency of country on imported fossil fuel and will lead India toward self-sufficiency and energy independence. Hence, it is necessary to expand and utilize the renewable energy sources like wind, solar, biomass, hydro power, waste to energy etc.



# GENERATION OF HYDROGEN GAS FROM SOLAR ENERGY

Prof. A. R. Mankar, Sandesh S. Nandagawali

Prof. A. R. Mankar, Guru Nanak Institute of Technology, Heat & Power  
Sandesh S. Nandagawali, Guru Nanak Institute of Technology, Heat & Power

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**Abstract** - The objective of this project is to create clean fuel for transportation using hydrogen powered by solar energy. Hydrogen has been generated by solar photovoltaic (PV) array and then collected for data analysis to demonstrate efficiency of the hydrogen production in all the steps of the experiment. The hydrogen produced from the electrolysis process was either stored in a metal hydride canister or directly fed into Proton Exchange Membrane (PEM) Fuel Cell to generate electricity. A hydrogen fuel cell remote control car has successfully designed, and demonstrates at least one hour operation per hydrogen charging at room temperature.

**Key Words:** Solar Energy, Hydrogen Production, Electrolysis, PEM Fuel Cell, Clean Fuel Transportation, Hydrogen Storage, Metal Hydrides, Electrolyzer, Energy Efficiency.

## 1. INTRODUCTION

Hydrogen will be the fuel of the future and step by step will replace all current fossil fuels. In AleaSoft an analysis of the impact of hydrogen on the energy sector has been carried out as a key factor in the ecological transition and a summary of the present and future use of this gas in various sectors of the economy. Hydrogen is the most abundant element in the universe. It is used as an input in oil refining, the production of ammonia and methanol and the manufacture of steel. Current global demand for hydrogen is more than 70 million tons per year. The supply of hydrogen to industrial users is now an important business worldwide. The demand for hydrogen, which has multiplied by more than three since 1975, continues to increase, supplied almost entirely by fossil fuels, with 6% of global natural gas and 2% of global coal destined for the production of hydrogen.

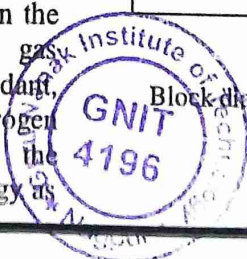
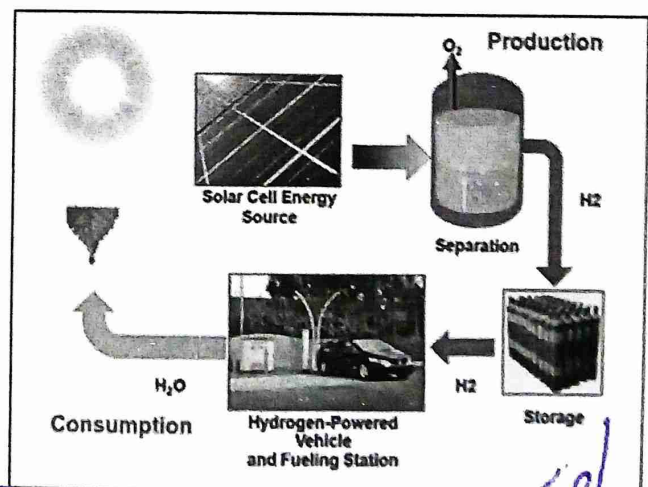
Hydrogen production plays a very important role in the development of hydrogen economy. Hydrogen gas production through solar energy which is abundant, clean and renewable is one of the promising hydrogen production approaches. This project overviews the generation of hydrogen generation using solar energy as

main source. It is concluded that developments of improved processes for hydrogen production via solar resource are likely to continue in order to reach competitive hydrogen production cost.

## 2. Literature Survey:

Gregoris Panayiotou et. al. [1] discussed the disadvantage of Renewable Energy Sources (RES) systems is their variability and dependence on environmental conditions. This problem can be overcome by storing energy in the form of hydrogen either for long or short term. One of the most promising types of such systems is the solar hydrogen energy system (SoHyS) where essentially the electricity produced by the PVs is stored in the form of hydrogen by using a variety of storage methods and means. The future trends of research in this area would be on more efficient electrolyzers and more advanced and lightweight storage media in order to increase the overall effectiveness of the system.

Simon Koumi Ngoh et. al. [2] Hydrogen production plays a very important role in the development of hydrogen economy. Hydrogen gas production through solar energy which is abundant, clean and renewable is one of the promising hydrogen production approaches. This article overviews the available technologies for hydrogen generation using solar energy as main source.



Block diagram of generation of hydrogen gas from solar energy

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# Water Extraction from Atmospheric Air

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## ABSTRACT

An experimental investigation of thermoelectric cooling employing a Peltier part to dry wet air below controlled, high ratio conditions have been conducted. The influence of the cold facet heat sink orientation on the water assortment rate was by experimentation determined. One finned heat sink-fan combination was used on the warmth rejection facet. On the cold facet flat plates, uncoated and Teflon (PTFE) coated, a fanned plate with four fins, and a heat sink having fifteen fins were used. The PTFE coated plate showed up to a half-hour higher water assortment rate (expressed in L/kWh) compared to the uncoated flat plate that has identical surface area. Clearing the surfaces—removing all atmospheric phenomenon The finned heat sink and therefore the PTFE coated flat plate were used for the orientation experiments. The finned heat sink was turned from 0 to 90, furthermore as leaning from 0 to 90 (vertical to horizontal). To investigate the result of surface orientation on a single-side assortment surface in isolation, the PTFE coated flat plate was leaning from 15 to 165 in 15 increments. The best assortment rates are found for a rotation angle of 60 and a leaning angle of 75 for the finned heat sink, 0.249 L/kWh and zero.221 L/kWh severally. The best measured assortment rate for the PTFE coated plate is zero.319 L/kWh at an associate orientation of 15 from the horizontal. Experiments for the horizontal orientation of the finned heat sink show that when the areas between the fins are completely crammed with water the gathering rate drops by an order of magnitude, from 0.203 L/kWh to zero.026 L/kWh. The experiments show that the orientation of a electricity heat sink ought to be thought-about once optimizing the water assortment rates underneath high humidness conditions for electricity cooling heat sinks.

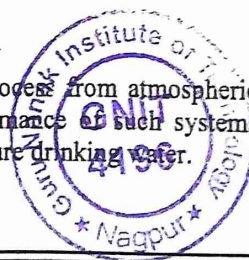
## INTRODUCTION

Fins or extended surfaces are used in heat exchanger design to enhance the heat transfer, typically in liquid/two-phase fluid to gas heat exchangers to address the low values of heat transfer coefficient on the gas side. Condensation occurs on the finned surface in applications when the finned surface temperature is below the saturation temperature of the gas in contact with the finned surface. Examples are heat exchangers used in industry to condense steam and air conditioning and refrigeration applications where water vapor from the air condenses on the heat exchanger surface. Condensation occurs either as film condensation or drop wise condensation. In most applications the objective is to have a high heat transfer rate and from this standpoint of view, drop wise condensation is preferred since drop wise condensation can result in more than 10 times higher heat transfer rates.

However, sustained drop wise condensation is tough to realize as a result of the tendency for the droplets to convert to film condensation when it slows. The factors touching condensation on finned surfaces embrace the geometry (shape) of the fins, the fin and surface material, and thermo-physical parameters. During condensation on finned surfaces heat and mass transfer crop up at the same time making the physics additional complicated. Studies target surface/droplet interactions and condensation, performance of warmth exchangers beneath dehumidification conditions and also the influence of warmth transfer surfaces on wet ability. The bestowed study is Associate in nursing experimental investigation of an electricity cooling heat sink wont to dry out dampish air beneath controlled, high ratio conditions. Studies have investigated the viability of victimization thermoelectric cooling to dry out or generate fresh from the atmosphere. Milani et al. investigated the practicability of victimization electricity coolers (TECs) devices within the dehumidification method to condense vapour from the atmosphere. They finished that the potential economic viability of police detective dehumidification systems could also be additional optimized by using larger cooling surfaces of deliquescent drop wise condensation advocate materials which advances in TECs style

## Objective

Understanding the basics of water extraction process from atmospheric air, working of atmospheric water extraction Systems and parameters that govern the performance of such systems Design, fabrication and development of an efficient water extraction system for delivering pure drinking water.



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# Comparative Study Of Compressive Strength Using Bacterial Concrete

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**Abstract :** Break arrangement is a generally noticed marvel in substantial designs. Albeit miniature break development scarcely influences underlying properties of developments, expanded penetrability because of miniature break systems administration may generously lessen the sturdiness of substantial designs because of hazard of entrance of forceful substances especially in damp conditions. To expand the regularly noticed autogenous break mending capability of concrete, explicit recuperating specialists can be fused in the substantial lattice.

Endeavor has been made to check the compressive strength and self mending of breaks in M30 and M40 grade of cement. The exploratory work completed utilizing microscopic organisms in two distinct rates 0.5% and 0.75% in M30 and M40 grade of cement. Result shows a superior presentation of oneself mending of miniature breaks in concrete and compressive strength of bacterial substantial increments fundamentally in M30 and M40 grade than typical cement.

**IndexTerms – concrete crack, Bacteria, Bio Concrete**

## I. INTRODUCTION

Concrete cement is perhaps the most generally utilized material for development works in the field of structural designing. This is basically because of minimal expense of materials and development, for substantial constructions just as minimal expense of upkeep. Concrete has a huge burden bearing limit with respect to pressure load, however the material is feeble in strain. Due to this steel support is given and the steel bars assume control over the heap when the substantial breaks in strain. Nonetheless, the breaks in the substantial represent an issue. Due to reasons like freeze-defrost responses, shrinkage, low elasticity of cement and so forth breaks happen during the cycle of substantial solidifying and this eventually prompts debilitating of the structures. In the event that water beads go into the substantial construction, because of absence of penetrability then it can harm the steel support present in the substantial part.

As of late another term bio-concrete is utilized for substantial combination which have high usefulness, high compressive strength, and low porousness. The bio-concrete is called as oneself mending concrete has high self-recuperating proficiency. With developing populace, industrialization and urbanization, there is a relating development in framework. A few examinations have shown that the presentation of cement can be fundamentally expanded by utilizing bio-concrete are the best added substances utilized in concrete or cement as a result of their high self-mending properties.

The guideline of microorganisms dependent on self-mending concrete is that carbonate encouraging microbes are added into concrete during the blending interaction. When breaking happens, the microscopic organisms will be actuated to accelerate  $\text{CaCO}_3$  to in-situ mend substantial breaks. This self-recuperating property brings about a recuperation of water-slugness, and consequently restricts the infiltration of destructive substance into substantial design and works on substantial sturdiness. To apply microbes for self-recuperating of substantial breaks, they ought to support their suitability until break arrangement. Subsequently, scientists are by and large proposing spores rather than vegetative cells for this application taking into account the more drawn out life length. As solvent Ca-source, calcium chloride ought to be kept away from because of the destructive impact on the support and calcium nitrate, calcium acetic acid derivation, calcium organization or calcium lactate can be proposed.

Different sorts of microscopic organisms that can be utilized in concrete for the cycle of self-recuperating are as per the following

1. Anaerobic microscopic organisms

In the event that anaerobic microscopic organisms like firmly related specie of shewanella are added to concrete, the compressive strength increments from 25-30%.

2. Aerobic microscopic organisms

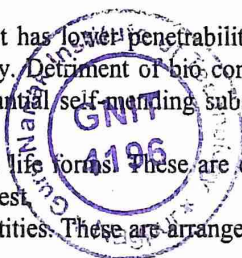
The different sorts of vigorous microscopic organisms that can be utilized in concrete are referenced underneath.

- Bacillus Subtilis.
- Bacillus Megaterium.
- Bacillus Pasteurii.
- Bacillus Phaericus.
- Escherichia coli.
- Bacillus cohnii.
- Bacillus pseudofirmus.
- Bacillus halodurans.

Bio concrete enjoys numerous benefits, for example, it has lower penetrability than regular cement, it decreased the erosion of support, curing of breaks should be possible effectively. Detriment of bio concrete is plan of bio concrete isn't referenced in IS codes or some other codes. The utilized of Bio substantial self-mending substantial which presents huge benefits in monetary, vigorous and ecological terms.

Microbes are moderately straightforward, single celled life forms. These are characterized dependent on three classifications, in particular, in light of shape, gram stain and oxygen interest.

Microbes are moderately basic, single celled organic entities. These are arranged dependent on three classes, to be specific, in light of shape, gram stain and oxygen interest.



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# Seismic Performance Assessment Of Irregular Rc Building

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**Abstract :** An undesirable energy because of quake and substantial breeze activities goes about as an information or outer burden on to the design. It prompts minor harms or complete breakdown of the construction. The harm to the construction relies upon numerous components like power of quake, top ground speed increase and primary properties. Harm to unpredictable designs brought about by imbalance in arrangement has been seen during many major and minor tremors during the past. The non-incident focal point of mass and firmness in a construction create plan unevenness which causes torsional vibration bringing about serious harm to underlying segments in the more horizontally adaptable locales of the design. Demonstrating assumes a vital part in plan and investigation of constructions.

In the current work, 5 story building models with various arrangement shapes have been considered viz. Square shape, Plus and L-molded structure (same arrangement region). At first, the powerful property, for example, mode shapes and time-frame is read for the three models considered. Time history examination utilizing four genuine ground movements is acted in SAP 2000, and the evaluation of these structures are finished by picking different basic harming measures, for example, story float, popular narrative uprooting, speed increase and base shear and it has been seen that Plus formed structure is more risky during seismic occasion.

Finally, Nonlinear static weakling investigation is performed to evaluate the general limit of the structure. The reaction decrease factor 'R' is additionally worked out and it is seen that Rectangle formed structure has 'R' esteem more than 5.0 and sporadic structure has esteem under 5.0, which is not quite the same as the worth referenced in IS 1893:2016. At last, it has been inferred that, seismic interest for unpredictable design is all the more so the huge energy because of tremor might be caught up with least harm.

**IndexTerms** - Asymmetric Building, Time History Analysis, Non Linear Static Push Over Analysis, Response Reduction Factor

## I. INTRODUCTION

A tremor is the shaking of the outside of the Earth, coming about because of the unexpected arrival of energy, which makes Seismic waves. Tremors can run in size from those that are feeble to the point that they can't be felt to those brutal enough to throw individuals around and annihilate entire urban areas. The seismicity of a space is the recurrence, type and size of quakes experienced over a time of time. At the Earth's surface, tremors show themselves by shaking and dislodging or disturbing the ground. Seismic tremors can likewise prompts avalanches and furthermore volcanic activity. Earthquakes are caused generally by burst of topographical deficiencies, yet in addition by different occasions like volcanic action, avalanches, mine impacts, and atomic tests. A quake's place of beginning burst is called its concentration or hypocentre. The focal point is the point at ground level straight over the hypocentre as displayed in figure 1.1.



### Irregularity

Numerous structures in the current situation have unpredictable arrangements both in arrangement and rise and these in future might be exposed to obliterating quakes. It is important to distinguish the exhibition of such unpredictable constructions against calamity for both the new and existing ones. Designs experience horizontal redirections under quake loads. Size of these parallel avoidances is identified with numerous factors like primary framework, mass of the design and mechanical properties of the underlying materials. Supported cement multi-celebrated structures are extremely perplexing to demonstrate as primary frameworks for investigation. The current adaptation of the IS 1893 (Part

1):2016 necessitates that for all intents and purposes all multi-storeyed structures be dissected as three dimensional frameworks. This is because of the abnormalities in arrangement or rise or in both. Underlying abnormalities are significant elements which decline the seismic exhibition of the designs. The investigation in general puts forth an attempt to assess the impact of vertical inconsistency on RC structures. The conduct of a structure during a seismic tremor relies upon a few factors, for example, solidness, sufficient sidelong strength, and malleability, basic and ordinary arrangements. The structures with normal math and consistently circulated mass and firmness in arrangement just as in height endure substantially less harm contrasted with unpredictable setups. Be that as it may, these days need and request of the most recent age and developing populace has made the draftsmen or designers unavoidable towards arranging of sporadic arrangements. Thus seismic tremor designing has fostered the main points of interest in understanding the job of building setups.

## II. LITERATURE REVIEW

Moehle (1985) clarified about the static investigation of unpredictable structure and their presentation for the seismic assessment of the design. For that reason, they have stepped through four diverse exam construction and they have broke down it for the seismic powers utilizing static examination. The models were unpredictable fit with vertical intermittence in height by eliminating some divider on the upper stories and it was tracked down that standard cutoff examination and static inelastic investigation give great proportions of solidarity and disfigurement attributes under solid tremor movements.

# Acid Effect on Waste Foundry Sand

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**ABSTRACT:** Quake safe plan of structures relies on furnishing the structure with strength, solidness and inelastic misshapening limit which are sufficiently incredible to withstand a given degree of seismic tremor created power. This is for the most part achieved through the choice of a proper structure design and the cautious itemizing of primary individuals. The significant viewpoints influencing seismic design of structures are in general math, primary frameworks, and burden ways.

This venture centers around the impact of both Vertical Aspect Ratio (H/B proportion for example Thinness Ratio) and Horizontal or Plan Aspect Ratio (L/B proportion), where H is the complete Height of the structure outline, B is the Base width and L is the Length of the structure outline with various Plan Configurations on the Seismic Analysis of Multi-storeyed Regular R.C.C. Structures. The test structures are kept ordinary in height and in arrangement. Here, stature and the base component of the structures are shifted by the Aspect Ratios. The upsides of Aspect Ratios are allocated to the point that it gives various setups to Low, Medium and High-ascent building models. In the current examination, four structure models having diverse Horizontal Aspect proportions viz. 1 and 2 going from 08m to 48m length of various Vertical stature have been thought of and their effect on the conduct of the RCC Multi-storeyed structures is illustrated, utilizing the boundaries for the plan according to the IS-1893-2002-Part-1 for the seismic zone-3 and 4. Medium Soil type is considered to ascertain Average reaction speed increase coefficient. In this manner complete 08 structure models are examined for various burden blends by Linear Elastic Dynamic Analysis (Response Spectrum investigation) with the assistance of STAAD Pro. programming and the outcomes got on seismic reaction of structures have been summed up. The tall structures ought to have little angle proportion i.e sides of the structure ought to be almost equivalent in size, which will make it less basic.

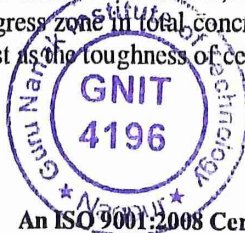
**KEYWORDS:** Seismic Analysis, Response Spectrum Analysis, Multi-storeyed Building, Staad Pro

## I. INTRODUCTION

The Foundry sand is great silica sand with uniform physical attributes. It is a result of ferrous and nonferrous metal projecting ventures. Sand has been utilized for quite a long time as a trim material due to its warm conductivity. It is a result from the creation of both ferrous and nonferrous metal castings. The physical and compound qualities of foundry sand will depend in extraordinary part on the kind of projecting interaction and the business area from which it begins. In current foundry practice, sand is ordinarily reused constantly through numerous creation cycles. Industry assesses that roughly 100 million tons of sand are utilized underway every year of that 6 - 10 million tons are disposed of every year and are accessible to be reused into different items and in industry. In India, around 2 million tons of waste foundry sand is delivered yearly.

### A) Binary Blended Concrete

It implies Metakaolin or other concrete substitution added substances are to be utilized with OPC as it were. That isn't rigorously obvious and double combinations include productive - frameworks. The essential impetus of adding restricted sum Metakaolin - for instance 10% guarantees high early strength, research has in any case shown that paired combinations of OPC, result in synergic activity to work on the miniature construction and execution of cement. When either Metakaolin or Fly-debris or other mineral admixtures are utilized, the resultant upgrade of solidarity or pozzolanic action was more prominent than super situation of commitments of each, for the individual extents. Such synergic impact comes about because of reinforcing the feeble progress zone in total concrete interface, just as division and impeding of pores. Along these lines, expanding the strength just as the toughness of cement.



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# Reliability Analysis Of High Rise Building

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**Abstract :** Because of developing populace and less space, Engineers are zeroing in on the idea of more inhabitation in less space. Draftsmen and Engineers are arranging a design so that the blockage because of less space is diminished and a wonderful construction with every one of the fundamental administrations can be given. For a tall building structure, it gets fundamental to support the breeze burden and tremor load contingent upon the area it is arranged in.

The unwavering quality investigation of a skyscraper structure is finished utilizing different materials as a divider component and the design is to meet the prerequisite of expanding populace by utilization of less material, simultaneously achieving the necessary strength and giving a practical construction by decreasing the material utilization contrasted with regular framework. This examination stress on the utilization of assortment of materials. Extended Polystyrene (EPS) and Autoclave Aerated Concrete (AAC) are utilized for the divider component of G+16 structure. Wind and seismic examination is done on every one of the two models and is contrasted and the substantial construction. The complete dead burden on the construction decreased because of utilization of EPS and AAC which brought about less base shear and story shear load. Likewise, the horizontal float is less for those designs. It was presumed that, EPS and AAC blocks are more conservative and achieves the necessary soundness by giving less horizontal float.

**IndexTerms – High Rise Building, EPS, AAC, Lateral Drift**

## I. INTRODUCTION

Concrete Structures are characterized as constructions used by individuals as asylum for living, working or capacity. With fast development in populace alongside the advancement of mechanical and business exercises quick urbanization has occurred which has come about into ceaseless development of rustic individuals to metro urban communities. So plainly the even space requirement is arriving at a disturbing circumstance for metros. To deal with the circumstance greatest usage of room upward requires the development of multistoried structures in huge numbers. Today, tall structures are an overall design wonder. According to a primary specialist's perspective tall structure or multi-storeyed structure is one that, by ideals of its stature, is influenced by parallel powers to a degree that they assume a significant part in the underlying model.

Reasonable lodging framework is the need of today looking towards the necessity of lodging for the country individuals. As indicated by the service of lodging and metropolitan undertakings assessment, there is a lodging deficiency of 20 million houses, with 99% in the monetarily more vulnerable and lower pay gatherings.

By and large, tall multi-story structures should be intended for wind just as tremor loads. Overseeing standards for doing dynamic examinations for quake load is not the same as wind load. As per the arrangements of Bureau of Indian Standards for quake load, IS 1893(Part 1):2002, tallness of the design, seismic zone, vertical and level abnormalities, delicate and feeble story requires dynamic investigation for tremor load. The commitment of the greater mode impacts are remembered for showing up at the conveyance of sidelong powers along the stature of the structure. At the point when wind communicates with a structure, both positive and negative pressing factors happen at the same time, the structure should have adequate solidarity to oppose the applied burdens from these pressing factors to forestall wind instigated assembling disappointment. Burden applied on the structure envelope are moved to the underlying framework, where in go they should be moved through the establishment into the ground, the greatness of the pressing factor is an element of the accompanying essential variables: uncovered fundamental breeze speed, geography, building stature, inward pressing factor, and building shape.

Likewise, with developing populace and less accessibility of room, the idea of unwavering quality examination is accomplishing high significance. Dependability centers around less space more inhabitation idea. It is being clarified in the further focuses. In this task, G+16 structure is being dissected. Three models are ready with various materials as divider components which are-Red block, EPS and AAC. Seismic and wind examination of the construction is done and the correlations are deciphered.

The primary goal of this examination is complete the investigation of a G+16 multi put away private structure against seismic tremor and wind stacks according to Indian standard codes of training IS 1893(Part 1):2002 and IS 875(Part 3):1987. The design was exposed to self-weight, dead burden, live burden, wind load and seismic burdens. Wind speeds, plan wind pressure, burdens to the structure are determined utilizing IS 875(Part 3):1987. Seismic burdens are determined utilizing IS 1893 (Part 1):2002.

Quake in everyday had a long history of dangerous destructions previously. Consistently everywhere on the world number of tremor hits the earth with low and focused energies. Tremors are generally eccentric and annihilating of every catastrophic event. Seismic tremors are vibrations or motions of ground surface brought about by transitory aggravation of the versatile or gravitational harmony of the stones at or underneath the outside of the earth. This unsettling influences and developments cause versatile driving forces or waves. These waves are referred to as seismic waves and named body waves-goes inside the group of earth and surface waves-over the outside of the earth. Tremors can be estimated as far as energy discharge for example estimating plentifulness, recurrence, and area of seismic waves and furthermore by assessing power for example thinking about the damaging impact of shaking ground on individuals, constructions and normal highlights. Power is estimated on adjusted Mercalli scale. In light of the pinnacle ground speed increase or development there are sure zones of the earth, named as seismic zones. In India there are four zones, II, III, IV, V – last one being the most devastating. The Indian subcontinent has a past filled with tremors. The justification the power and high recurrence of tremors is the Indian plate crashing into Asia at a pace of around 47 mm/year.

## The Journal of Strain Analysis for Engineering Design



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### CGA: An image processing based software for surface strain analysis in sheet metal forming

Wankhede Parikaj , Tejas Radhakrishnan, (...), and Sudha Radhika [View all authors and affiliations](#)

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### Abstract

Strain analysis is an essential step in sheet forming applications to understand the deformation behaviour of the material. The strain analysis is conventionally performed by Circle Grid Analysis (CGA). In CGA, a grid of circles with 2 mm–5 mm diameter is printed on a flat sheet and deformed into the required shape. The length of major and minor axes of the deformed ellipses are measured to estimate the strains at different

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# Corner detection of a quadrilateral for strain analysis in sheet metal forming by image processing

Pankaj Wankhede  , Tejas Radhakrishnan, Sudha Radhika & Suresh Kurra

Pages 1986-1996 | Accepted 06 Jan 2021, Published online: 26 Jan 2021

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## ABSTRACT

Circle Grid Analysis (CGA) and Square Grid Analysis (SGA) are commonly used methods to

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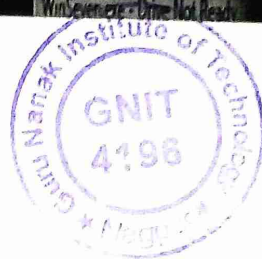
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**REVIEW ON LINBO<sub>3</sub> BASED EO-MZI FOR DESIGNING  
OPTOELECTRONICS DEVICES FOR WDM SYSTEMS**

**Arun G<sup>1</sup>, Dr. A. S. Rathore<sup>2</sup>, Dr. Sudhir N Shelke<sup>3</sup>**

<sup>1</sup> Research Scholar, Department of Electronics & Communication Engineering, Sri Satya Sai University of Technology & Medical Sciences, Sehore, M.P.

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Received : 03.10.2020

Revised : 05.11.2020

Accepted : 07.12.2020


**ABSTRACT:**

The consistently rising demand for bandwidth makes it very difficult to grade electronic devices at these higher transmission rates, especially owing to their energy usage and power dissipation. Optics is a promising alternative for high-speed operations involving latch and memory components such as optical packet routing and ultra-fast computing. To achieve higher speed of data transfer, signal should be in the optical form. Semiconductor Optical Amplifier- Mach-Zehnder Interferometer (SOA-MZI) has played a significant role in the field of ultra- fast signal (optical) processing. In this article, review on LINBO<sub>3</sub> based EO-MZI for designing optoelectronics devices for WDM systems has been discussed.

**Keywords:** LINBO<sub>3</sub>, EO-MZI, Optoelectronics, WDM

**INTRODUCTION:**

Many researchers have analysed the performance of SOA-MZI based switches and XOR gate through numerical simulations to generalize the optimal parameters as well as the suitable

  
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# A NEW HARMONICS ELIMINATION METHOD APPLIED TO A STATIC VAR COMPENSATOR

- Ankush A. Kosare

Department of Electrical Engineering,  
GNT Nagpur, Maharashtra, INDIA, RTMN University Nagpur  
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**Abstract**— In this paper, the use of harmonics elimination method applied to a three level inverter which calculates the switching angles. Simulations results using MATLAB program are carried out to validate the mathematical model. Harmonics are generated in power system due to various reasons such as nonlinear loads, iron core devices, semiconductor switching devices etc. So, it is important to reduce harmonic content from output of Static VAR Compensator in order to avoid harmful effects of harmonics such as noise, overheating, voltage flicker, torque pulses etc. This project investigates an optimal strategy for harmonic reduction in the inverter based converters

**Keywords** – GTO, SVC, PWM, FACTS, Inverter, Reactive Power Compensation, MATLAB.

## I. INTRODUCTION

As we know that recently the multilevel pulse width modulation (PWM) converter topology has drawn tremendous interest in the power industry since it can easily provide the high power required for high power applications and for that they use static VAR compensation, active power filters, and so that large motors can also be controlled by high power adjustable frequency drives [1].

A Static VAR Compensator is a device which belongs to the family of FACTS devices where as FACTS stands for flexible AC transmission Systems are a family of devices which can be inserted into power grid in series, in shunt, and in some cases, both in series and shunt combination. With the help of FACTS devices, availability and efficiency of power grids are improved, for existing just as well as for new grids. Recent advances in the power handling capabilities of static switches have made the use of the voltage source inverters (VSI) feasible at both the transmission and distribution levels [1].

## II. HARMONICS

A harmonic is a signal or wave whose frequency is an integral (whole-number) multiple of the frequency of some reference signal or wave. In a 50Hz system, the 3rd harmonic is at 150Hz, 5th at 250Hz, 7th at 350Hz and so on [2].

The troublesome harmonics for single phase loads are the 3rd and odd multiples of the 3rd i.e. the 9th, 15th etc. These harmonics are called “triplen harmonics”. The triplen harmonics on each phase are all in phase with each other which will cause them to add rather than cancel in the neutral conductor of a three phase four wire systems. This can overload the neutral if it is not sized to handle this type of load. On the other hand, three phase non linear loads generate primarily 5th and 7th current harmonics. And a small amount of 11th, 13th and higher orders. These types of loads do not generate triplen harmonics [2].

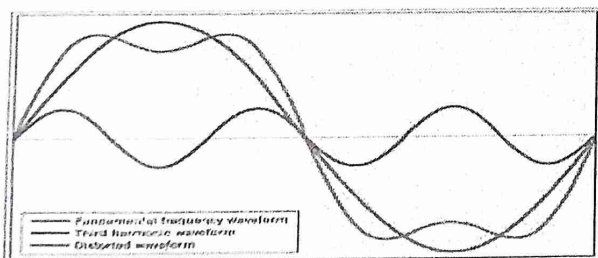


Fig.2.1 Waveform with harmonics

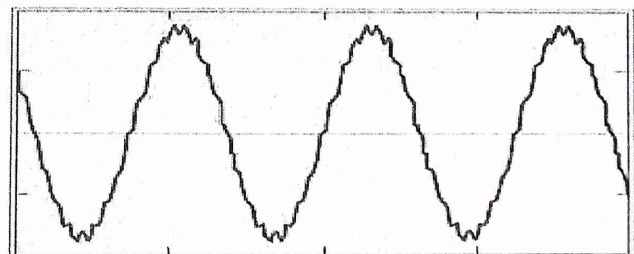


Fig.2.2 Fundamental waveform with 3<sup>rd</sup> harmonic content

# DESIGN OF STAIR-CLIMBING WHEELCHAIR USING TRI-WHEEL MECHANISM

## *Mechanical Engineering*

<sup>1</sup>Suyog Bhajankar, <sup>2</sup>Nitin Dhote, <sup>3</sup>Prashant Nandanwar, <sup>4</sup>Parag Khot, <sup>5</sup>Sumit Gudadhe, <sup>6</sup>Shubham Mamulkar, <sup>7</sup>Raju Pawankar

<sup>1</sup>Asst. Prof., <sup>2</sup>UGtudents, <sup>3</sup>UGtudents, <sup>4</sup>UGtudents, <sup>5</sup>UGtudents, <sup>6</sup>UGtudents, <sup>7</sup>UGtudents,  
<sup>1</sup>Department of Mechanical Engineering, GuruNanak Institute of Technology, Nagpur, Maharashtra, India.

**Abstract :** The objective of this work is to develop a mechanism for climbing up and down over stairs for physically disabled people. The mechanism involved is a tri-wheel mechanism for climbing up and down stairs. The modeling is done in SolidWorks designing software. Tri-wheel mechanism is a unique mechanism for climbing stairs. The analysis is carried out by considering three different materials and the best material is suggested for fabrication. (1) The mechanism involved is a tri-wheel mechanism which is unique and simple in design for climbing stairs. The shaft is designed based on theoretical force analysis and the wheelchair is designed. The design of components is done using Solid Works software. Stress, strain, and deformation analysis are done by considering three different materials and best material is suggested. The tri-wheel mechanism is simple for fabrication and it reduces the total cost of fabrication of wheelchair. These results will help to design of shaft based on human weight. With the help of tri-wheel mechanism stair-climbing wheelchair, we can move easily up and down on stairs without building ramps in hospitals, by this construction area and money can be reduced for building hospitals.

**KeyWords -** Stairs, Tri-Wheel Mechanism, Wheel Chair, Ramp.

## I. INTRODUCTION

The main Purpose of technology is to provide comfort to the people. Many countries are currently experiencing what is referred to as an "Aging population". The average human age is increased and accordingly the Number of old people is also increased. A common problem in every country that Older people are facing difficulty in mobility. In this regard, traditional wheelchairs and powered wheelchairs continue to play a vital role.

Though some people are born with disability, many people become disabled due to injuries and health problems. Perhaps, people with disabilities (PWD) depends non-disabled people including family members for their mobility. Wheelchairs are one of the key assistive devices for PWD across the world. Generally, wheelchairs are grouped into five categories, namely: Manual wheelchairs, Attendant-propelled chairs, rigid frame wheelchair, folding frame wheelchair and motorized wheelchair/ power chair/ electric-powered wheelchair. Among them, electric-powered wheelchair is more suitable for PWD as it reduces their dependence on their assistants. (9) The Disabled people difficult to travel from one place to another by ordinary wheelchair even though they get help from others. So most of the times the physically disabled people will remain in homes due to lack of facilities like elevators and uneven roads. Due to the above activities, it may affect their physiology and psychology (1)

A wheelchair is a wheeled mobility device. There have been a number of innovations in this field since then. Wheelchairs could be broadly classified into (1) manual wheelchairs and (2) powered wheelchairs. Manual wheelchairs require human physical power to move. The device is propelled either manually or via various automation systems. Wheelchairs are used by people for whom walking is difficult or impossible due to illness, injury, or disability.

### Objectives of Automated Wheelchair

Automated wheelchairs that are equipped with sensors & data processing unit are termed as Smart Wheelchair. Our goal is to design and develop a system that allows the user to interact with Wheel chair. (15) The society nowadays concentrating on physical disabled and old people to provide solution by developing and constructing elevators, but it is not possible everywhere. So Stair-climbing wheelchair plays an important role in the life of disabled people.

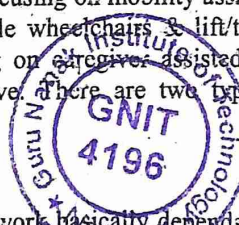
This work is mainly based to overcome the disadvantages of existing stair-climbing wheel chair by incorporating tri-wheel mechanism. The tri-wheel mechanism is optimized and added to a wheelchair. The tri-wheel mechanism allows the wheelchair to climb easily up and down stairs and also to move freely on Un-Even road, etc. It improves the safety and comfort of the wheelchair.

## II. Literature Review

This chapter provides a study on assistive devices, focusing on mobility assistive devices and patient lift/transfer devices. It gives a bird's eye view on various commercially available wheelchairs & lift/transfer systems and a thorough literature review of researches happening in this area majorly focusing on caregiver assisted transfer devices and self-transfer devices. Manual wheelchairs require human physical power to move. There are two types of standard manual wheelchairs, self propelled wheelchair and attendant propelled wheelchair.

### Eye and Voice Controlled Wheel Chair

Swati Jajee, Prof. Sanjivkumar Jalde (6) Proposed work basically depends on two systems. In Eye Control system is used to guide and control the wheelchair for disabled persons based on movement of eye. This method concept can be used for persons



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# Experimental Analysis of Heat Transfer In Porous Medium With Different Material

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<sup>2</sup> Assistant Professor, Guru Nanak Institute of Technology, Nagpur, India

**Abstract** – An experimental study to evaluate the dynamics of forced convection heat transfer in a thermally isolated column filled with porous medium has been carried out. The behavior of two porous media with different grain sizes and specific surfaces has been observed. The experimental data have been compared with an analytical Solution for one - dimensional heat transport for local non thermal equilibrium condition. The interpretation of the experimental data shows that the heterogeneity of the porous medium affects heat transport dynamics, causing a channelling effect which has Consequences on thermal dispersion phenomena and heat transfer between fluid and solid phases, limiting the capacity to store or dissipate heat in the porous medium.

**Keywords-** Heat Transfer, Porous Media, Nusselt Number ,Thermal conductivity, Effective Thermal Conductivity.

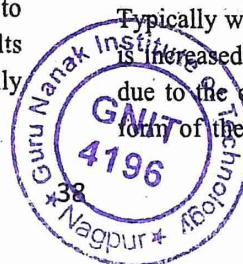
## I- INTRODUCTION

Heat transfer in porous media has recently become an important subject in mechanical engineering. This study presents experimental and numerical investigations of the effective thermal conductivity in porous medium. Effective heat transfer is essential in a variety of energy technologies in order to enable the maximum possible power density and power conversion efficiency needed for economic competitiveness and fuel conservation. The goal of enhanced heat transfer is to encourage or accommodate high heat fluxes. This results in reduction of heat exchanger size, which generally leads to less capital cost [1]. Another advantage is the

reduction of temperature driving force, which reduces the entropy generation and increases the second law efficiency. In addition, the heat transfer enhancement enables heat exchangers to operate at smaller velocity, but still achieve the same or even higher heat transfer coefficient [2]. Heat transfer enhancement technology has been widely applied to heat exchanger applications in refrigeration, automobile, process industries etc [3-8]. In general, enhanced heat transfer surfaces can be used for three purposes: 1- to make heat exchangers more compact in order to reduce their overall volume, and possibly their cost, 2- to reduce the pumping power required for a given heat transfer process, or 3- to increase the overall UA value of the heat exchanger. Heat transfer enhancement techniques can be divided into two groups: active and passive techniques. The active techniques require external power to facilitate the desired flow modification and the concomitant improvement in the rate of heat transfer. Spacing 1.15 inches justified. Introduction should be in times new roman size 10 normal, line spacing 1.15 inches justified. Introduction should be in times new roman size 10 normal, line spacing 1.15 inches justified. Introduction should be in times new roman size 10 normal, line spacing 1.15 inches justified.

## II-METHODOLOGY

A porous medium is a medium typically filled with structures such as granular solids, foams or fibres. Typically when fibres are used the porosity of the media is increased to over 90%. Such high porosity is mainly due to the complex surface chemistry and the irregular form of the fibres [3]. The medium usually undergoes



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# Design, Analysis and Fabrication of Instant water cooler using Thermoelectric Module

Kanchan K. Ingle<sup>1</sup> | Prof. K. N. Wagh<sup>1</sup> | Dr. N.N. Wadaskar<sup>1</sup> | Prof. S. Bhajankar<sup>1</sup>

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## To Cite this Article

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## Article Info

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## ABSTRACT

Hot and cold water is always needed for human being; different systems are used to get hot and cold water. The devices which are available in market for heating and cooling purpose have more cost and size of those systems is more. e.g. refrigerator, electric heater and solar water heater. In this current paper, peltier effect is used to get cold as well as hot water simultaneously with cheapest cost and applicable to used in residential area also. This paper aims toward developing a system which will provide cooling and heating effect simultaneously without moving mechanical parts. Thermoelectric cooling and heating system does not require working fluids. This device can be used to cool water without use of refrigerants. And simultaneously heating can be achieved from the hot side of thermoelectric module to heat the water, this is due to heat absorption and rejection using peltier element. This compact design is very useful in elimination of CFC and it would replace conventional refrigeration system. In this study experimentally Tests were carried out to determine the time taken for the temperature of 250ml of water in a glass jar to be reduced from 40°C to below 16°C. The result shows the cool water and heat water.

**KEYWORDS:** Thermoelectric cooler element, heat exchanger, peltier element-TEC1-12706, Thermal paste, heat sink

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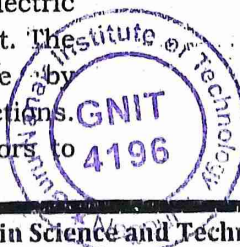
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## I. INTRODUCTION

**Basic concept of instant water cooler using thermoelectric cooler**

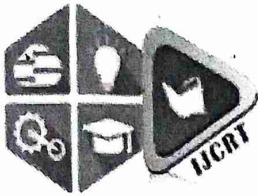
A thermoelectric module also called as thermoelectric cooler or Peltier cooler, is a semiconductor-based electronics component that functions as a small heat pump, moving heat from one side of the device to the other. Thermoelectric coolers operate according to the Peltier effect. The effect creates a temperature difference by transferring heat between two electrical junctions. A voltage is applied across joined conductors to

create an electric current. When the current flows through the junctions of the two conductors, heat is removed at one junction and cooling occurs. Heat is deposited at the other junction. The main application of peltier effect is cooling. However the peltier effect can also be used for heating or control of temperature. In every case, a DC voltage is required.



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# INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

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## Development And Testing Of Photovoltaic Panel For Cooling Under Natural Condition

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**Abstract:** Solar energy is the most abundant source of energy available on earth. This can be used by converting it into either thermal energy or electric energy with the help of collector & photovoltaic cell. PV cell is one of the most popular renewable energy products. It can directly convert the solar radiation into electricity which can be utilized to power household appliances. However, during the operation of the PV cell, only around 15% of solar radiation is converted to electricity with the rest converted to heat. The electrical efficiency will decrease when the operating temperature of the PV module increases. In this work, we developed two different cooling techniques (one passive & one active) to maintain the temperature of PV module & compared with conventional panel under natural convection. For the active cooling, wood wool is attached at the backside of the panel. The water is provided on that after 2 hours for heat removal. For the passive cooling, honeycomb fins made up of aluminium sheet of 0.8 mm thickness are used & pressed fit at the backside of the panel with the help of plywood & nut bolts. The experimental result shows 15% improvement in electrical efficiency than the conventional panel.

**Index Terms -** Photovoltaic panel, Renewable energy, Cooling, Efficiency

### I. INTRODUCTION

Photovoltaic (PV) is a method for electrical power generation by converting solar radiation into electricity using semiconductors without using any heat engine. Photovoltaic devices are simple in design requiring very little maintenance. They can work as stand-alone systems to give outputs from microwatts to megawatts depending on the application. The application of photovoltaic is very wide including water pumping, remote buildings, solar home systems, communications, satellites, space vehicles and for large power plants. Owing to this capability, the demand for photovoltaic is increasing all over the world and has begun to become economically competitive with conventional energy sources. The photovoltaic cell consists of at least two layers of semiconductor material, one with a positive and the other with negative charge. Some of the photons from the incidence sun light are absorbed by the semiconductor atoms which causes electrons of the semiconductor negative layer to be freed from the cell. The released electrons flow through a circuit and finally back into the positive layer to complete the circuit. The performance of the PV system is affected by several parameters including temperature. The part of absorbed solar radiation that is not converted into the electricity converts into thermal energy and causes a decrease in electrical efficiency. This undesirable effect which leads to an increase in the PV cell's working temperature and consequently causing a drop of conversion efficiency can be partially avoided by a proper method of heat extraction.

Many researchers have investigated & proposed different methods to optimize the performance of Photovoltaic panel & to reduce the installation costs. Aram Mohammad Ahmad [1] improved the efficiency of panel by spraying the water at different flow rates (3 L/h, 6 L/h and 9 L/h) on the surface of the panel. The results showed that the efficiency of panel increased with a flow rate of 3 liters/hour by 8.3 % than conventional panel. Abdolzadeh and Ameri [2] improved the performance of a photovoltaic water pumping system by spraying water over the top surface of PV array experimentally. They pointed out that the efficiency of a photovoltaic water pump system can be increased due to spraying water over the front of PV array. Furushima and Nawata [3] evaluated the performance of PV-power generation system equipped with cooling device utilizing siphonage. The study showed that the cooling of the PV modules increased the electrical power output and produced hot water which could be for heating purposes thereby contributing an energy efficient system. Pravesh Kumar et al [4] designed a cooling system in which array of water tube was fitted to back of solar panel to reduce its temperature and bring temperature to normal operating point by forced convection. The result showed a maximum photoelectric conversion efficiency difference of 2.6%, and the temperature decreased by 1-2 degree Celsius. The output power generation efficiency was increased by 0.5 to 1 % for the solar PV panel when using heat pipe for air-cooling. H.G. Teo et al [5] studied hybrid PV/T solar system experimentally & used air to extract heat from the PV module rear surface. They pointed out with an active cooling; temperature dropped significantly leading to an increase in efficiency of solar cells to between 12% and 14%. R. Rajaram et al [6] investigated the use of phase change material (PCM) to maintain the temperature of panel close to the ambient temperature. The performance of solar panel improved by using the phase change material Cobalt Sulphate Heptahydrate situated at the back of the solar panel. The implementation of phase change material under the solar panel has increased the performance of the solar panel by 5.02% and an increase in power production by



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Review Article

# A review on the evaluation of formability in sheet metal forming

Pankaj Wankhede & Kurra Suresh

Pages 458-485 | Accepted 14 Feb 2020, Published online: 04 Mar 2020

Cite this article <https://doi.org/10.1080/2374068X.2020.1731229>

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## ABSTRACT

In sheet metal forming processes, formability is a critical material property that needs to be estimated before the production of forming parts. Some popular tools used in the literature to study the formability of the sheet metal are: Forming Limit Diagram (FLD),

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# CLOUD COMPUTING SECURITY ISSUES IN IAAS SERVICES: A REVIEW

Akshay Saraf<sup>1</sup>, Neeranjan Chitre<sup>2</sup>,

<sup>1,2</sup>Professors,

<sup>1</sup>Department of Computer Science and Engineering,  
G.H. Rasoni University India.

<sup>2</sup>Department of Computer Science and Engineering,  
GNIT College Nagpur India.

July 24, 2018

## Abstract

With the web getting so well-known information sharing and security of individual information has increased considerably more significance than previously. Cloud gives and proficient approach to outsource the information either on the web or disconnected however information security winds up one of the real issues in questionable multi-cloud condition. This paper tends to the heap adjusting and security issues in cloud condition and furthermore gives an approach to give better security and load adjusting in cloud environment.

**Key Words:** IaaS, SaaS, PaaS.

## 1 Introduction

Building advancement and its determination are two segregating successful factors for any business/ affiliation. Distributed computing is a late advancement perfect model that enables affiliations or individuals to confer diverse organizations in a predictable and



# “GSM Based Electricity Theft Detection in Distribution Systems”

Dr. Sudhir Shelke, Mr. Abhay Sawalkar, Ms. Apeksha Kulkarni,  
Ms. Mrunali Dhote, Ms. Bhavana Ghate,  
Research Scholar Department of Electronics and Telecommunication Engineering,  
\*Principal & Guide  
Guru Nanak Institute of Technology, Nagpur, Maharashtra, India.

**Abstract :** Electrical power theft detection system is used to detect an unauthorized tapping on distribution lines. Implementation area of this system is a distribution network of electrical power supply system. Existing system is not able to identify the exact location of tapping. This system actually finds out on which electrical line there is a tapping. This is a real time system. Wireless data transmission and receiving technique is used. This will provide an additional facility of wireless meter reading with the same technique and in same cost. This will protect distribution network from power theft done by tapping, meter tampering etc.

**Keywords-** RISC, AVR, GSM, Power Supply Design.

## 1. INTRODUCTION

Power theft is the biggest and major problem in recent times which leads to huge loss to electricity boards. It is very important to take this issue in to consideration and hence to resolve and to overcome these losses prices are increased. So if this theft get prevented then lots of power can be saved, to which will in turn be very beneficial. The normal practice for power theft is to short input and output terminals or to place magnet on the wheel. These practices meter are followed in old meters. So by sensing current flow through the line and energy feedback or using circuit breaker. In this novel system a micro controller is interfaced with an energy metering circuit & current sensing circuit, GSM and a contactor to make or break power line. In normal condition micro controller reads energy pulses and current signals. If current is drawing and energy pulses are not getting then it indicates power theft. So microcontroller trip the output using relay. This information is sent to substation using wireless communication.

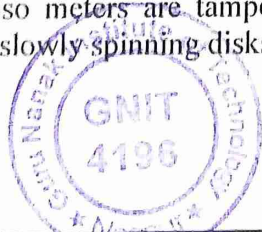
## 2. SURVEY

Earlier several cases related to electricity theft generally used to take place in villages because they need more power requirement for their field to drive water pump and its motors. All the other farm related work which requires more electricity. Hence various modes of power theft are studied which are as follows :-  
Bogus seal and tampering of seals, Meter tampering, meter tilting, meter interface and meter bypassing, Changing connection, Direct tapping from line, By using remote sensing device, Improper or illegal use of power meters.

### *Two Major Ways of Power Theft*

**Power Tapping:** Often power theft is done during transmission by illegal tapping of the power lines to divert the power to the required destinations. It is also done by illegal connections to the power grid stations, which are cut at the time of billing.

**Meter fraud:** In many areas where manual reading of the meter is done, the person is often bribed to give false readings and thus the amount paid is for lesser amount of power compared to the power actually consumed. Also meters are tampered by obstructing the motion of the disk (usually electro mechanical consists of slowly spinning disks to record the power consumed).



*Shay*

# A Review on Internet Of Things(IOT) Based Underground Cable Fault Detection

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**Abstract:** A fault is an unexpected change of the system functionality, which causes deviation of a plant behavior from that which is specified it. The problem of detect the location of fault in transmission line has become complex and expensive which depended on The current mechanism used to detect the fault in power transmission lines approximated by the calculation of the impedance obtained from voltage and current data. The works of this is to find solution of how detected and located of fault in the transmission line Diagnosing fault source is difficult and entire cable should be taken out from the ground to check and fix faults. The project work is intended to detect the location of fault in underground cable lines from the base station in km using a micro-controller 8051. To locate a fault in the cable, the cable must be tested for faults. This prototype uses the simple concept of Ohms law. The current would vary depending upon the length of fault of the cable. In the urban areas, the electrical cables run in underground instead of overhead lines. Whenever the fault occurs in underground cable it is difficult to detect the exact location of the fault for process of repairing that particular cable. The proposed system finds the exact location of the fault. The prototype is modeled with a set of resistors representing cable length in km and fault creation is made by a set of switches at every known distance to cross check the accuracy of the same. In case of fault, the voltage across series resistors changes accordingly, which is then fed to an ADC to develop precise digital data to a programmed 8051 IC that further displays fault location in distance.

The fault occurring distance, phase, and time is displayed on a 16X2 LCD interfaced with the micro-controller. IOT is used to display the information over Internet using the Wi-Fi module ESP8266. A web page is created using HTML coding and the information about occurrence of fault is displayed in a web page. At the end of research we have acquired results that it can be determined where the error with high accuracy.

**Index Terms -** Underground Cable, Fault Location, Location Methods, Micro-controller, web page, IOT.

## I. INTRODUCTION

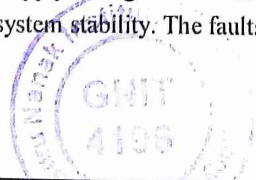
In an electric power system, a fault is detected by any abnormal electric current follow. For example, a short circuit is a fault in which current bypasses the normal load. An open-circuit fault occurs if a circuit is interrupted by some failure. In three-phase systems, a fault may involve one or more phases and ground, or may occur only between phases. In a "ground fault" or "earth fault", charge flows into the earth. The prospective short circuit current of a fault can be calculated for power systems. In power systems, protective devices detect fault conditions and operate circuit breakers and other devices to limit the loss of service due to a failure. In a poly phase system, a fault may affect all phases equally which is also called symmetrical fault. If only some phases are affected, the resulting asymmetrical fault becomes more complicated to analyze because the simplifying assumption of equal current magnitude in all phases is no longer applicable. The analysis of this type of fault is often simplified by using methods such as symmetrical components.

A symmetric or balanced fault affects each of the three phases equally. In transmission line faults, roughly 5% are symmetric This is in contrast to an asymmetrical fault, where the three phases are not affected equally. An asymmetric or unbalanced fault does not affect each of the three phases equally Power transmission and distribution lines are the vital links that achieve the essential continuity of service of electrical power to the end users. Transmission lines connect the generating stations and load centers. Faults are caused either by insulation failures and conducting path failures. Most of the faults on transmission and distribution lines are caused by over voltage due to lightning and switching surges or by external conducting objects falling on over head lines. Birds, tree branches may also cause faults on over head lines. Other causes of faults on over head lines are direct lightning strokes, aircraft, snakes, ice and snow loading, storms, earthquakes, creepers etc. In the case of cables, transformers, generators the causes may be failure of solid insulation due to aging, heat, moisture or over voltage, accidental contact with earth . The overall faults can be classified into two types:

1. Series faults
2. Shunt faults

A fault if unclear has the following effects on a power system.

- Heavy short circuit current may cause damage to equipment or any other element of the power system due to over heating or flash over and high mechanical forces set up due to heavy current.
- There may be reduction in the supply voltage of the healthy feeders, resulting in the loss of industrial loads. Short circuits may cause the unbalancing of the supply voltages and currents, there by heating rotating machines.
- There may be a loss of system stability. The faults may cause an interruption of supply to consume



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## Driving Super-capacitor Equipped Metro-Train using Microcontroller

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**Abstract:** This paper represents the super capacitor based metro train using micro-controller and divided into two parts- charging of metro train and saving of energy. Super capacitors (SCs), also known as ultra capacitors and electric double-layer capacitors, are finding use in a variety of power management applications. Energy can generate from most of the sources like solar, wind, hydro, coal as a fuel in plant etc. But in most there is cost problems for plant establishing, running, maintenance or availability of resources (fuels) which are going to be exhausted. One day new generation of rapid transit trains requires a more effective energy management for reduction of energy consumption during the journey. But this metro is not completely depended on electricity means to say that here the continuous supply will be eliminated which is use to drive metro with the help of overhead line. It also eliminated overhead line and other electrical equipment required in metro train system. In automotive applications such as start-stop systems with regenerative braking, SCs can provide the energy needed to engage the starter to restart the combustion engine as well as accept the kinetic energy recovered during braking.

**Keywords:** DC Shunt motor, Servomotor, Super-capacitor, AVR, Micro-controller, Motor Driver IC.

### I. Introduction

Since last few years people mobility has increased in urban areas, implying the necessity of rapid transit improvement in terms of passenger capacity and number of journey than metro is the best option. The charging of this unit is done by using electric supply, and this charging port is positioned on each and every metro station to make available supply to super-capacitor for its charging. The main benefit of super-capacitor is, it take less charging time. We also install ultra sonic sensors in our metro system in order to avoid accident and maintain the safety of passengers and vehicle. These sensors are to be found in-front of the train. These sensors be full of transmitter and receiver. When metro train engages in the braking action, the super-capacitor unit converts kinetic energy- energy that is lost in friction braking system into stored electrical energy. Unlike batteries, super capacitor rapidly charge and discharge, enabling them to capture and store energy during braking. Battery based system have limited ability to absorb energy in few second required to stop metro train.

### II. Theory And Modelling

In INDIA the metros are running using overhead transmission lines on 25000 volt AC. These overhead lines are having several disadvantages such as the maintenance of overhead lines is very difficult, the complete system shut down during maintenance of overhead lines and during fault condition. This creates a great impact on whole system, hence to overcome this disadvantage, this project finds a replacement of super capacitors for the overhead lines. This replacement is of great significance it helps to save a great amount of energy. The Paper has presented an overview of the application of super-capacitor based energy storage system in electrical rail system. For demo practical hardware presentation, number of components is being used.

#### A. DC Shunt Motor

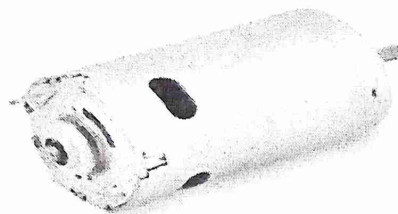


Fig 1: DC Shunt Motor





# Analysis and Design of G+6 Building in Different Seismic Zones by using Software

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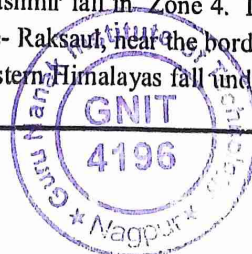
<sup>2</sup>Associate and Professor, Dean R & D, Department of Civil Engineering, Guru Nanak Institute of Technology, Nagpur, India

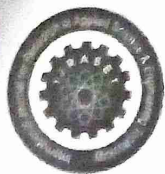
**Abstract:** The principle objective of this project is to analyze and design of G + 6 building in different seismic zones and in different soil types by using ETABS. In this project, all the four zones and three types of soils have been taken under consideration. ETABS (Extended Three Dimensional Analysis of Building System) is a software that is incorporated with all the major analysis engines that are static, dynamic, Linear and non-linear and especially this Software is used to analyze and design the buildings. The present work is to study the behaviour of a G+6 building subjected to earthquake load by adopting Response spectrum analysis. We analyzed G + 6 storey building for all possible load combinations [Dead, Live & Seismic loads]. Seismic loads were taken as per IS 1893: 2002. Our final work was the analysis of G + 6 building under various load combination. We considered a commercial building as specified in the plan. The height from the ground floor to sixth floor is 3.0 m. The structure was subjected to self-weight, dead load, live load and seismic loads under the load case details of ETABS. Seismic load calculations were done with the following IS 1893-2000 (part-1). The materials were specified and cross-sections of the beam and column members were assigned. The supports at the base of the structure were also specified as fixed.

**Keywords:** ETABS, G+6, Soils, Zones, Analysis, Design.

## I. INTRODUCTION

The design of buildings wherein there is no damage during the strong but rare earthquake is called earthquake-proof design. The engineers do not attempt to make earthquake-proof buildings that will not get damaged even during the rare but strong earthquake. Such buildings will be too robust and also too expensive. The aim of the earthquake resistant design is to have structures that will behave elastically and survive without collapse under major earthquakes that might occur during the life of the structure. To avoid collapse during a major earthquake, structural members must be ductile enough to absorb and dissipate energy by post-elastic deformation. Many researchers have been conducted on this topic and still, it is continuing because more we try to learn more we can minimize the damages and save the lives. According to studies that have been made on seismology about 90% earthquake happens due to tectonics. If we come to civil engineering an engineer's job is to provide maximum safety in the structures designed and maintain the economy. Prior to the analysis and design of any structure, necessary information regarding supporting soil has to be collected by means of geotechnical investigation. A geotechnical site investigation is a process of collecting information and evaluating the conditions of the site for the purpose of designing and constructing the foundation for a structure. Structural engineers are facing the challenges of striving for most efficient and economical design with accuracy in solution while ensuring that the final design of a building and the building must be serviceable for its intended function over its design lifetime. Now a day's various software packages are available in the market for analyzing and designing practically all types of structures viz. RISA, STAADPRO, ETABS, STRUDL, MIDAS, SAP and RAM, etc. The latest version of the seismic zoning map of India given in the earthquake resistant design code of India [IS 1893 (Part1) 2002] assigns four levels of seismicity for India in terms of zone factors. In other words, the earthquake-zoning map of India divides India into 4 seismic zones (Zone 2, 3, 4 and 5) unlike its previous version, which consisted of five or six zones for the country. According to the present zoning map, Zone 5 expects the highest level of seismicity whereas Zone 2 is associated with the lowest level of seismicity. Zone 5 covers the areas with the highest risks zone that suffers earthquakes of intensity MSK IX or greater. The IS code assigns zone factor of 0.36 for Zone 5. Structural designers use this factor for earthquake resistant design of structures in Zone 5. The zone factor of 0.36 is indicative of effective (zero periods) level earthquake in this zone. It is referred to as the Very High Damage Risk Zone. The region of Kashmir, the western and central Himalayas, North and Middle Bihar, the North-East Indian region and the Rann of Kutch fall in this zone. Zone 4 is called the High Damage Risk Zone and covers areas liable to MSK VIII. The IS code assigns zone factor of 0.24 for Zone 4. The Indo-Gangetic basin and the capital of the country (Delhi), Jammu and Kashmir fall in Zone 4. In Maharashtra, the Patan area (Koyananager) is also in zone no 4. In Bihar, the northern part of the state like- Raksaul, near the border of India and Nepal, is also in zone no 4. Zone 3, the Andaman and Nicobar Islands, parts of Kashmir, Western Himalayas fall under this zone. This zone is classified as Moderate





# Comparing the Effect of Earthquake on High Rise Building with & without Shear Wall and Shear Wall with Opening by using Software

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**Abstract:** Most of India's cities are now growing vertically, as the population in cities is rising and the space to accommodate the growing number remains limited, so real estate developers in India are developing high-rise projects, both in luxury and affordable categories, to reach out to a large number of home buyers across different income groups. As we go higher, buildings have to resist lateral loads due to wind and earthquake. To resist these lateral forces, RCC Shear wall is constructed. In any structure there is need of opening for proper utility and ventilation to all rooms. Shear wall with opening are not preferred because such walls are not able to transfer the load to ground properly, so they fail. This study is carried out on twelve storied residential building with and without shear wall and shear wall with opening by using ETABS software. On the basis of results which we will get from software, Lateral Loads, Story Drifts, Percent of Still is calculated and compared.

**Keywords:** Shear wall, ETABS, With Opening, Without Opening, Lateral load, Story drift

## I. INTRODUCTION

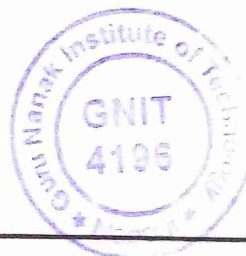
Today, high rise buildings have huge demand due to increase in population and least availability of land in the heart of city. Instead of going outskirts of town, everyone wants to live in the city, so high rise building, towers are one of the best options to satisfy the needs of people. As the height of building increases, lateral forces due to seismic becomes predominant. Shear walls are specially designed structural walls incorporated in buildings to resist lateral forces that are produced in the plane of the wall due to wind, earthquake and other forces. Such wall is mostly constructed in high rise buildings. These walls are designed for the regions likely to experience earthquake of large intensity or high wind. Shear walls are generally made of concrete or masonry. They are usually provided between columns, in stairwells, lift wells, on the corners of building perpendicular to length of building etc.

Shear walls may have one or more openings for functional reasons such as doors, windows, and other types of openings. Depending on purposes of the openings in shear wall, the size and location of openings may vary. The size and location of shear walls is extremely critical. Properly designed and construction of shear wall in buildings have shown good performance in past earthquakes. When a structural member experiences failure by shear, two parts of it are pushed in different directions, i.e. when a piece of paper is cut by scissors. Shear walls in high seismic regions require special detailing. However, in past earthquakes, even buildings with sufficient number of walls that were not specially detailed for seismic performance but had enough well distributed reinforcement, had been saved from collapse. Shear walls are efficient, both in terms of construction cost and effectiveness in minimizing earthquake damage in structural and non-structural elements like glass windows and building contents.

1) **Earthquake Zones:** The Indian subcontinent has a history of devastating earthquakes. The major reason for the high frequency and intensity of the earthquakes is that the Indian plate is driving into Asia at a rate of approximately 47 mm/year. Geographical statistics of India show that almost 54% of the land is vulnerable to earthquakes. The latest version of seismic zoning map of India given in the earthquake resistant design code of India IS 1893 (Part 1) 2002 assigns four levels of seismicity for India in terms of zone factors. In other words, the earthquake zoning map of India divides India into four seismic zones Zone II, III, IV and V. Unlike its previous version which consisted of five or six zones for the country. According to the present zoning map, Zone V expects the highest level of seismicity whereas Zone II is associated with the lowest level of seismicity.

2) **Factors Affecting Earthquake Design Of Structure**

- Type of soil and different zone.
- Damping factor of the structure.
- Ductility of the structure.
- Importance of the building.
- Type of foundation of the structure.



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# Review Paper on Static Analysis and Design of Retaining Wall with and without Shelf using Software

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**Abstract:** This paper presents the results of Static analysis and Design of retaining wall with and without shelves. Cantilever retaining wall with pressure relief shelves is considered as a special type of retaining wall. The concept of providing pressure relief shelves on the backfill side of a R.C.C retaining wall reduces the total earth pressure on the wall, which results in a reduced thickness of the wall and ultimately in an economic design of a cantilever wall. The conclusions in this thesis drawn based on the discussion and results obtained analytically and using Staad-Pro. model study. The pressure distribution diagram changes much due to addition of shelves. The pressure relief shelves have been extend up to the failure plane to achieve the stability of the structure. In practice, there is limitation of using more number of shelves, but up to three shelf may be used economically for high retaining walls. It is also observed that, the average saving in cost of construction is 15% to 25% by the provision of relief shelves over the conventional cantilever retaining wall. Analytical results of active earth pressure, nodal reactions, and bending moments with pressure relief shelves have been close agreement with the Staad-Pro. Software result.

**Keywords:** Special retaining wall, Relief shelves, Earth pressure, Stability of wall, Bearing pressure, Overturning moment and bending moment.

## I. INTRODUCTION

This Retaining walls are generally built to hold back soil mass. Retaining walls are structures that are constructed to retain such materials which are unable to stand vertically by themselves. They are also provided to maintain the grounds at two different levels. The study in this thesis is carried out mainly for improvisation of the 'retaining structure' as it is an indispensable features of civil construction projects, especially all types of bridges, high walls in hilly terrain, etc. with suitable type, proper design and reasonable estimation. A retaining wall with pressure relief shelf is uncommon type of retaining wall. The pressure relief shelf towards the backfill side of retaining wall reduces the total earth pressure on the stem wall which results in increasing the overall stability of wall. The less material goes into the stem wall due to provision of shelves to the retaining wall and some material acts vertically on the pressure relieving shelves and ultimately this result into the economical design.

### A. Objective of Case Study

- 1) To analyze and design the modal retaining wall with and without shelf by Conventional Method.
- 2) To compare the results obtained from analysis and design of retaining wall with and without shelf and discuss the results.
- 3) To analyze of modal retaining wall with and without shelf using Software. Cost comparison between retaining wall with and without shelf.
- 4) To make the retaining wall stable so that soil bearing pressure gives equal pressure distribution on both sides.

## II. LITERATURE REVIEW

MIRJO FUTAKI, OLAMU SAKAGUCHI (1992) [1]: This paper concerned with the experimental study on a real scale cantilever retaining wall for seismic loadings. In this paper, Soil-Structure Interaction has been done by model test. The present paper intends to investigate the safety and to evaluate the force acting on the wall for the seismic loadings.

RAJESH D. PADHYE, PRAHULINGU B. ULAGADDI (2010) [2]: The active earth pressure and level arm are reduced due to provision of shelf and there by achieve versa considerable reduction the moment about the base slab.

DR. D. N. SHINDE, MR. ROHAN R. WATVE (2015) [3]: This paper concerned with the analysis of cantilever retaining wall using Finite Element method. The retaining wall with and without shelves is analysed by using Staad-pro model and results for various parameters are to be compared in this paper.



# Soil Interaction Effect in Multi-storied Building with Cohesive and Non Cohesive Soil

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**Abstract:** The main aim of this project is based on comparing the effect of earthquake on building structural systems having cohesive and non-cohesive soil media. The project starts with abroad note of studying for fixed base and soil interaction.

**Keywords:** Seismic analysis, Earthquake excitation, Super moment resisting frame, member forces, joint displacement, support reaction, storey drift, E-tab 2016

## I. INTRODUCTION

Earthquake is known to be one of the most destructive phenomenon experienced on earth. It is caused due to a sudden release of energy in the earth's crust which results in seismic waves. When the seismic waves reach the foundation level of the structure, it experiences horizontal and vertical motion at ground surface level. Due to this, earthquake is responsible for the damage to various man-made structures like buildings, bridges, roads, dams, etc. It also causes landslides, liquefaction, slope-instability and overall loss of life and property. Most of the time earthquakes are caused by the slippage along a fault in the earth's crust. When the fault ruptures in the earth's crust, the seismic waves will travel away from the source known as focus, in all direction to the ground surface. As they travel through different geological materials, the waves are reflected and refracted. Throughout the whole journey from the bedrock to the ground surface, the waves may experience amplification Soil-structure interaction (SSI) analysis evaluates the collective response of three linked systems: the structure, the foundation, and the soil underlying and surrounding the foundation. Problems associated with practical application of SSI for building structures are rooted in a poor understanding of fundamental SSI principles.

### A. Advantageous of E-tab

- 1) Easy and quick model creation for any type of structure.
- 2) Creation of 3D model with utilization of plan and view.
- 3) Automatic consideration of self-weight of material.
- 4) Automatic creation of seismic load and wind load.
- 5) Load combination as per your defined building code is also automated.
- 6) Easy report and documentation

### B. Loads And Load Combination

- 1)  $1.2(DL+LL\pm(EQX\pm 0.3EQY\pm 0.3EQZ))$
- 2)  $1.2(DL+LL\pm(EQY\pm 0.3EQX\pm 0.3EQZ))$
- 3)  $1.5(DL\pm(EQX\pm 0.3EQY\pm 0.3EQZ))$
- 4)  $1.5(DL\pm(EQY\pm 0.3EQX\pm 0.3EQZ))$
- 5)  $0.9DL\pm 1.5(EQX\pm 0.3EQY\pm 0.3EQZ)$
- 6)  $0.9DL\pm 1.5(EQY\pm 0.3EQX\pm 0.3EQZ)$

Loads considered: Dead load: the load due to its self-weight.

Live load: for residential building live load is taken as KN/m<sup>2</sup>

Seismic load: the load due to acceleration response of the

Ground to the super structure

### C. Model Detail

Model 1- Eleven storey(G+10) building with fixed support and cohesive soil media.

Model 2 - Eleven storey(G+10) building with soil structure interaction and cohesive soil media.

Model 3- Eleven storey(G+10) building with fixed support and non-cohesive soil media.



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