

## MGM's College of Engineering, Nanded

### 3.3.1 Number of research papers published per teacher in the Journals notified on UGC CARE list during the last five years

Sr. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Calendar Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal /Digital Object		
							Link to website of the Journal	Link to article / paper / abstract of the article	Is it listed in UGC Care list
1	Evaluation of Engineering Demand Parameters of RC Multistoreyed Building Subjected to Extreme Blast Event	Sneha Hirekhan, Mohd. Zameeruddin and P. S. Charpe	Civil Engineering	Journal of Aeronautical Materials	2023	1005-5053	Journal of Aeronautical Materials (hkclxb.cn)	<a href="https://www.hkclxb.cn/article/view/2023/1386.html">https://www.hkclxb.cn/article/view/2023/1386.html</a>	Scopus
2	Predicting Safety of the Building Subjected to Blast Loading Using Performance-based Seismic Framework	Sneha Hirekhan, Mohd. Zameeruddin and P. S. Charpe	Civil Engineering	Journal of Aeronautical Materials	2023	1005-5053	Journal of Aeronautical Materials (hkclxb.cn)	<a href="https://www.hkclxb.cn/article/view/2023/1473.html">https://www.hkclxb.cn/article/view/2023/1473.html</a>	Scopus
3	Using the Vulnerability Index for Performance-based Seismic Assessment of Reinforced Concrete Frames and Clearly Articulating the Performance Levels	Abhay Hirekhan, Mohd. Zameeruddin and P. S. Charpe	Civil Engineering	Journal of Aeronautical Materials	2023	1005-5053	Journal of Aeronautical Materials (hkclxb.cn)	<a href="https://www.hkclxb.cn/article/view/2023/1398.html">https://www.hkclxb.cn/article/view/2023/1398.html</a>	Scopus
4	Seismic Performance Evaluation of Indian Code – Designed Concrete Moment Resisting Frames using PBSE Procedures	Abhay Hirekhan, Mohd. Zameeruddin and P. S. Charpe	Civil Engineering	European Chemical Bulletin	2023	2063-5346	European Chemical Bulletin (eurchembull.com)	<a href="https://www.eurchembull.com/issue-content/seismic-performance-evaluation-of-indian-code-designed-concrete-moment-resisting-frames-using-pbse-procedures-3769">https://www.eurchembull.com/issue-content/seismic-performance-evaluation-of-indian-code-designed-concrete-moment-resisting-frames-using-pbse-procedures-3769</a>	Scopus
5	Impact of seasonal Water Logging Problems and its effect in urban area: A Case Study of Nanded City, Maharashtra	S. V. kannawar, A. A. Bhole and M. P. Kulkarni	Civil Engineering	International Journal of Innovative Research in Technology	2023	2349-6002	<a href="https://ijirt.org/">https://ijirt.org/</a>	<a href="https://ijirt.org/Issue?volume=9&amp;issue=12&amp;month=May%202023">https://ijirt.org/Issue?volume=9&amp;issue=12&amp;month=May%202023</a>	Yes, 47859
6	Water Supply in Marathwada Region: An Overview	M. P. Kulkarni, S. V. kannawar and A. A. Bhole	Civil Engineering	International Journal of Engineering Research and Applications	2023	2248-9622	www.ijera.com	<a href="https://www.ijera.com/pages/v13-no5.html">https://www.ijera.com/pages/v13-no5.html</a>	Yes, 47088
7	Performance Based Efficient Design of Reinforced Concrete Frames with Vertical Irregularities	Karanpal Singh Hardeep Singh Hazuria, Arshad K Hashmi and Lakshmanagouda G Patil	Civil Engineering	Asian Journal of Civil Engineering	2022	1563-0854	<a href="https://link.springer.com/article/10.1007/s42107-022-00429-9">https://link.springer.com/article/10.1007/s42107-022-00429-9</a>	<a href="https://doi.org/10.1007/s42107-022-00429-9">https://doi.org/10.1007/s42107-022-00429-9</a>	Scopus

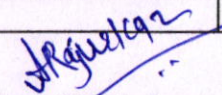
8	Seismic damage assessment of low-rise reinforced concrete structure with performance-based seismic design approach	Amey R. Khedikar, Mohd. Zameeruddin and P. S. Charpe	Civil Engineering	Advances and Applications in Mathematical Sciences	2022	0974-6803	<a href="https://www.mililink.com/journals_desc.php?id=59">https://www.mililink.com/journals_desc.php?id=59</a>	<a href="https://www.mililink.com/upload/article/2110005761aams_vol_219_july_2022_a29_p5173-5184_amey_raju_khedikar_et_al..pdf">https://www.mililink.com/upload/article/2110005761aams_vol_219_july_2022_a29_p5173-5184_amey_raju_khedikar_et_al..pdf</a>	Scopus
9	Design of framework for multi-objective workflow planning for IaaS platform in cloud environment	Anil Kadam and K.C. Jondhale	Electronics & Telecommunication Engineering	International Journal of Health Sciences	2022	2550-6978	<a href="https://portal.issn.org/resource/ISSN/2550-6978">https://portal.issn.org/resource/ISSN/2550-6978</a>	<a href="https://sciencescholar.us/journal/index.php/ijhs/article/view/6423">https://sciencescholar.us/journal/index.php/ijhs/article/view/6423</a>	Scopus
10	Design of Framework for Aggregate Key Sharing Mechanism in Cloud Environment	Anil Kadam and K.C. Jondhale,	Electronics & Telecommunication Engineering	International Journal of Optoelectronics Laser	2022	1005-0086	<a href="https://gbzjg.org/index.php/JOL/issue/view/7-2023.html">https://gbzjg.org/index.php/JOL/issue/view/7-2023.html</a>	<a href="https://gbzjg.org/index.php/JOL/article/view/298.html">https://gbzjg.org/index.php/JOL/article/view/298.html</a>	Scopus
11	An Efficient Flower Classification System Using Feature Fusion	Dr. M.R. Banwaskar and Dr. A.M. Rajurkar	Electronics & Telecommunication Engineering	International Journals on Engineering Trends and Technology	2022	2231 – 5381	<a href="https://ijettjournal.org/">https://ijettjournal.org/</a>	<a href="https://ijettjournal.org/Volume-70/Issue-11/IJETT-V70I11P207.pdf">https://ijettjournal.org/Volume-70/Issue-11/IJETT-V70I11P207.pdf</a>	Scopus
12	Seismic Development and Study of Fragility Curve	Dhange Shiva Vilas, Mohd. Zameeruddin and Shimpale P. M.	Civil Engineering	International Journal of Research in Engineering Application & Management	2022	2454-9150	<a href="https://www.ijream.org/">https://www.ijream.org/</a>	<a href="https://www.ijream.org/IJREAM_V08I07.html">https://www.ijream.org/IJREAM_V08I07.html</a>	Yes. 64077
13	Seismic Performance Evaluation and Fragility Analysis of Reinforced Concrete Structures	Dhange Shiva Vilas, Mohd. Zameeruddin and Shimpale P. M.	Civil Engineering	International Journal of Research in Engineering Application & Management	2022	2454-9150	<a href="https://www.ijream.org/">https://www.ijream.org/</a>	<a href="https://www.ijream.org/IJREAM_V08I06.html">https://www.ijream.org/IJREAM_V08I06.html</a>	Yes. 64077
14	Assessment of Capability of Moment Resisting Frames using Force-based and Displacement-based Approaches	Adnan Amin Thara and Mohd. Zameeruddin	Civil Engineering	International Journal of Research in Engineering Application & Management	2022	2454-9150	<a href="https://www.ijream.org/">https://www.ijream.org/</a>	<a href="https://www.ijream.org/IJREAM_V08I07.html">https://www.ijream.org/IJREAM_V08I07.html</a>	Yes, 64077
15	On Assessment of Nonlinear responses of Medium-rise 3D RC Frames using Performance Evaluation Methods suggested in FEMA 440	Param Balaji Bachewar and Mohd. Zameeruddin	Civil Engineering	International Journal of Research in Engineering Application & Management	2022	2454-9150	<a href="https://www.ijream.org/">https://www.ijream.org/</a>	<a href="https://www.ijream.org/IJREAM_V08I03.html">https://www.ijream.org/IJREAM_V08I03.html</a>	Yes, 64077
16	Agriculture Cyber Physical System for Crop Recommendation	R. S. Hingole, Darshan Khairnar, Yash Dhawade, Vishal Rathod and Abhijeet Kokare,	Mechanical Engineering	International Journal for Research in Applied Science and Engineering Technology	2022	2321-9653	<a href="https://www.ijraset.com/">https://www.ijraset.com/</a>	<a href="https://doi.org/10.22214/ijraset.2022.40080">https://doi.org/10.22214/ijraset.2022.40080</a>	Yes, 45842


17	Design and Development of Hydraulically Operated Torx Key Manufacturing Machine	R. S. Hingole, Nilesh Savale, Ritesh Ghuge, Dipak Aandhale	Mechanical Engineering	International Journal for Research in Applied Science and Engineering Technology	2022	2321-9653	<a href="https://www.ijraset.com/">https://www.ijraset.com/</a>	<a href="https://doi.org/10.22214/ijraset.2022.40557">https://doi.org/10.22214/ijraset.2022.40557</a>	Yes, 45842
18	Seismic Behavior of Regular and Irregular Structure with and without Infill	S. N. Batkulwar and R. R. Alurwad	Civil Engineering	International Journal of Engineering Research and Applications	2022	2248-9622	<a href="https://www.ijera.com/">https://www.ijera.com/</a>	<a href="https://www.ijera.com/pages/v12no12.html">https://www.ijera.com/pages/v12no12.html</a>	Yes, 47088
19	Parametric Study of Factors Influencing Mode of Oscillation	H. A. Kadam and R. R. Sharma	Civil Engineering	International Journal of Emerging Research and Application	2022	2248-9622	<a href="https://www.ijera.com/">https://www.ijera.com/</a>	<a href="https://www.ijera.com/pages/v12no7.html">https://www.ijera.com/pages/v12no7.html</a>	Yes, 47088
20	Influence of Different Lateral Load Resisting Structural System on Seismic Performance	S.D. Sawale and R. R. Sharma	Civil Engineering	International Journal of Emerging Research and Application	2022	2248-9622	<a href="https://www.ijera.com/">https://www.ijera.com/</a>	<a href="https://www.ijera.com/pages/v12no3.html">https://www.ijera.com/pages/v12no3.html</a>	Yes, 47088
21	Study of Mechanical properties of Epoxy Composites filled with Graphite & TiO <sub>2</sub>	C P Ramdasi and Dr. J. S. Sidhu	Mechanical Engineering	International Journals of Engineering Research and Application	2021	2248-9622	<a href="https://www.ijera.com/">https://www.ijera.com/</a>	<a href="https://www.ijera.com/papers/vol11no2/Series-2/F1102024954.pdf">https://www.ijera.com/papers/vol11no2/Series-2/F1102024954.pdf</a>	Yes, 47088
22	Seismic Vulnerability Assessment of Regular and Irregular RC Buildings using Pushover Analysis	Shaikh Ahrajfarhan Abdul Riyaz and Mohd. Zameeruddin	Civil Engineering	International Journal of Research in Engineering Application & Management	2021	2454-9150	<a href="https://www.ijream.org/">https://www.ijream.org/</a>	<a href="https://www.ijream.org/IJREAM_V08I02.html">https://www.ijream.org/IJREAM_V08I02.html</a>	Yes, 64077
23	Performance Evaluation of Moment Resisting Frames with SCWB and WCSB Configuration using Performance-based Seismic Procedures	Zameer Ahemad and Mohd. Zameeruddin	Civil Engineering	International Journal of Research in Engineering Application & Management	2021	2454-9150	<a href="https://www.ijream.org/">https://www.ijream.org/</a>	<a href="https://www.ijream.org/IJREAM_V07I03.html">https://www.ijream.org/IJREAM_V07I03.html</a>	Yes, 64077
24	Evaluating the Effects of Plastic Hinge Location on Performance of the Moment Resisting Frames subjected to Seismic Loads	Mohammad Asif and Mohd. Zameeruddin	Civil Engineering	International Journal of Research in Engineering Application & Management	2021	2454-9150	<a href="https://www.ijream.org/">https://www.ijream.org/</a>	<a href="https://www.ijream.org/IJREAM_V07I05.html">https://www.ijream.org/IJREAM_V07I05.html</a>	Yes, 64077
25	Performance-based Seismic Evaluation of Vertically Irregular Moment Resisting Reinforced Concrete Frames using Nonlinear Statics Analysis	Abdul Mabood, Mohd. Zameerruddin, and P.M. Shimpale	Civil Engineering	SSRG International Journal of Civil Engineering	2021	2348-8352	<a href="https://www.internationaljournalsssrg.org/IJCE/index.html">https://www.internationaljournalsssrg.org/IJCE/index.html</a>	<a href="https://www.internationaljournalsssrg.org/IJCE/paper-details?Id=466">https://www.internationaljournalsssrg.org/IJCE/paper-details?Id=466</a>	Scopus

26	Evaluation of efficacy of the elevated water tank under the seismic loads	Tayyaba Anjum and Mohd Zameeruddin	Civil Engineering	SSRG International Journal of Civil Engineering	2021	2348-8352	<a href="https://www.internationaljournalssrg.org/IJCE/index.html">https://www.internationaljournalssrg.org/IJCE/index.html</a>	<a href="https://www.internationaljournalssrg.org/IJCE/paper-details?Id=451">https://www.internationaljournalssrg.org/IJCE/paper-details?Id=451</a>	Scopus
27	Estimation of the efficacy of tuned liquid column damper using frequency response curves	Rishikesh Hingole and Mohd Zameeruddin	Civil Engineering	SSRG International Journal of Civil Engineering	2021	2348-8352	<a href="https://www.internationaljournalssrg.org/IJCE/index.html">https://www.internationaljournalssrg.org/IJCE/index.html</a>	<a href="https://www.internationaljournalssrg.org/IJCE/paper-details?Id=449">https://www.internationaljournalssrg.org/IJCE/paper-details?Id=449</a>	Scopus
28	Damage assessment of reinforced concrete moment resisting frames using performance-based seismic evaluation procedure	Mohd. Zameeruddin and Keshav K Sangle	Civil Engineering	Journal of King Saud –Engineering Sciences	2021	1018-3639	Journal of King Saud University - Engineering Sciences   ScienceDirect.com by Elsevier	Damage assessment of reinforced concrete moment resisting frames using performance-based seismic evaluation procedure - ScienceDirect	Scopus
29	Performance-based seismic assessment of Reinforced concrete moment resisting frames	Mohd. Zameeruddin and Keshav K Sangle	Civil Engineering	Journal of King Saud –Engineering Sciences	2021	1018-3639	Journal of King Saud University - Engineering Sciences   ScienceDirect.com by Elsevier	<a href="https://www.sciencedirect.com/science/article/pii/S1018363920302245?via%3Dihub">https://www.sciencedirect.com/science/article/pii/S1018363920302245?via%3Dihub</a>	Scopus
30	Study of Punching Shear in Flat Slab System Subjected to Seismic Load	A. S. Naradwar and R. R. Alurwad	Civil Engineering	International Journal of Creative Research Thought	2021	2320-2882	<a href="https://ijcrt.org/">https://ijcrt.org/</a>	<a href="https://ijcrt.org/archive.php?vol=9&amp;issue=7&amp;pubmonth=July-2021">https://ijcrt.org/archive.php?vol=9&amp;issue=7&amp;pubmonth=July-2021</a>	Yes, 49023
31	Behavior RCC structure with different configuration of Infill Wall with different Configuration of RCC	Mukassar Najeeb and R. R. Alurwad	Civil Engineering	International Journal of Creative Research Thought	2021	2320-2882	<a href="https://ijcrt.org/">https://ijcrt.org/</a>	<a href="https://ijcrt.org/archive.php?vol=9&amp;issue=6&amp;pubmonth=June-2021">https://ijcrt.org/archive.php?vol=9&amp;issue=6&amp;pubmonth=June-2021</a>	Yes, 49023
32	Parametric Study on Time Period of a RC Structure	R. V. Bawalge and R. R. R. Sharma	Civil Engineering	International Journal of Engineering, Research and Application	2021	2248-9622	<a href="http://www.ijera.com">www.ijera.com</a>	<a href="https://www.ijera.com/pages/v11no2.html">https://www.ijera.com/pages/v11no2.html</a>	Yes, 47088
33	Enhancing lifetime of Wireless Multimedia Sensor Network Using Modified Lion Algorithm-based Image Transmission Model	M. P. Wankhede and K.C. Jondhale	Electronics & Telecommunication Engineering	Data Technologies and Publication	2020	2514-9288	<a href="https://www.emerald.com/insight/content/doi/10.1108/DTA-02-2020-0028/full/html">https://www.emerald.com/insight/content/doi/10.1108/DTA-02-2020-0028/full/html</a>	<a href="https://www.emerald.com/insight/content/doi/10.1108/DTA-02-2020-0028/full/html">https://www.emerald.com/insight/content/doi/10.1108/DTA-02-2020-0028/full/html</a>	Scopus
34	Hybrid Modal-based Image Transmission for maximizing network lifetime in wireless Multimedia Sensor Networks	M. P. Wankhede and K.C. Jondhale	Electronics & Telecommunication Engineering	International Journal on Wavelets, Multiresolution and information processing	2020	0219-6913	<a href="https://worldscientific.com/worldscinet/ijwmip">https://worldscientific.com/worldscinet/ijwmip</a>	<a href="https://worldscientific.com/toc/ijwmip/19/02">https://worldscientific.com/toc/ijwmip/19/02</a>	Scopus
35	Data Stream Classification: a review	K. K. Wankhede, S. S. Dongre and K.C. Jondhale	Electronics & Telecommunication Engineering	Iran Journal of Computer Science	2020	2520-8438	<a href="https://link.springer.com/journal/42044">https://link.springer.com/journal/42044</a>	<a href="https://link.springer.com/article/10.1007/s42044-020-00061-3">https://link.springer.com/article/10.1007/s42044-020-00061-3</a>	Scopus

36	Content-based retrieval system for surgery videos	M. R. Banwaskar and A. M. Rajurkar	Electronics & Telecommunication Engineering	International Journal of Autonomic Computing	2020	1741-8569	<a href="https://www.inderscience.com/jhome.php?jcode=ijac">https://www.inderscience.com/jhome.php?jcode=ijac</a>	<a href="https://www.inderscienceonline.com/doi/abs/10.1504/IJAC.2020.114391">https://www.inderscienceonline.com/doi/abs/10.1504/IJAC.2020.114391</a>	Scopus
37	Fragility Analysis of Masonry Infilled Reinforced Concrete Frames for Near Field Earthquake	Arshad K. Hashmi, Alok Madan	Civil Engineering	KSCE Journal of Civil Engineering	2020	1226-7988	<a href="https://link.springer.com/journal/12205">https://link.springer.com/journal/12205</a>	<a href="https://link.springer.com/article/10.1007/s12205-020-1443-x">https://link.springer.com/article/10.1007/s12205-020-1443-x</a>	Scopus
38	Analysis of Tree structure for Secure Group Communication Using LKH Approach	Aparna S. Pande, Yashwant V. Joshi, Manisha Y. Joshi, and Lalitkumar Wadhwa	Computer Science and Engineering	International Journal of Computer Sciences and Engineering	2019	2347-2693	<a href="http://www.ijcseonline.org">www.ijcseonline.org</a>	<a href="https://doi.org/10.26438/ijcse/v7i3.11301136">https://doi.org/10.26438/ijcse/v7i3.11301136</a>	Yes, 63193
39	Design of Epoxy Based Resin Composites for Automotive Applications: A Case Study on I C Engine valve guide	J.S.Sidhu, G.S.Lathkar, and S.B.Sharma	Mechanical Engineering	Institution of Engineers, Series C	2019	2250-0545	<a href="https://link.springer.com/journal/40032">https://link.springer.com/journal/40032</a>	<a href="https://link.springer.com/article/10.1007/s40032-017-0439-x">https://link.springer.com/article/10.1007/s40032-017-0439-x</a>	Scopus
40	An Ensemble Clustering Method of Intrusion Detection	K. K. Wankhede and K.C. Jondhale	Electronics & Telecommunication Engineering	International Journal of Intelligent Engineering Informatics	2019	1758-8715	<a href="https://www.inderscience.com/jhome.php?jcode=ijiei">https://www.inderscience.com/jhome.php?jcode=ijiei</a>	<a href="https://www.inderscience.com/info/inarticle.php?artid=99085">https://www.inderscience.com/info/inarticle.php?artid=99085</a>	Scopus
41	Nanotechnology: A New Perspective for Management of Environment	M. R. Banwaskar and S. N. Dachawar	Electronics & Telecommunication Engineering	International Journal of Research and Analytical Reviews	2019	2348-1269	<a href="https://ijrar.org/">https://ijrar.org/</a>	<a href="http://ijrar.com/upload_issue/ijrar_issue_20542927.pdf">http://ijrar.com/upload_issue/ijrar_issue_20542927.pdf</a>	Yes, 43602(19)
42	Peer-to-peer networks approach for discovery of decentralized service	R. R. Hazari and Ritesh Gangasingh Bais	Information Technology	International Journal of Research and Analytical Reviews (IJRAR)	2019	2348-1269	<a href="http://ijrar.org/viewfull.php?&amp;p_id=IJRAR19K7615">http://ijrar.org/viewfull.php?&amp;p_id=IJRAR19K7615</a>	<a href="https://drive.google.com/file/d/1PWjduEYy3hBXOYs4OBM-lFeWpKeBlyjH/view?usp=drive_link">https://drive.google.com/file/d/1PWjduEYy3hBXOYs4OBM-lFeWpKeBlyjH/view?usp=drive_link</a>	Yes, 43602

43	P2P Based Decentralized Service Discovery	R. R. Hazari and Ritesh Gangasingh Bais	Information Technology	Journal of Emerging Technologies and Innovative Research (JETIR)	2019	2349-5162	<a href="https://www.jetir.org/view?paper=JETIR1908615">https://www.jetir.org/view?paper=JETIR1908615</a>	<a href="https://drive.google.com/file/d/11U73M29wOBU5yIlDOtJW7Q6vKctDvtO-/view?usp=drive_link">https://drive.google.com/file/d/11U73M29wOBU5yIlDOtJW7Q6vKctDvtO-/view?usp=drive_link</a>	Yes, 63975
44	Optimization of Glass fiber and MoS2 Filled PTFE Composites Using Non Traditional Optimization Techniques	Prasad M. Patare and G.S. Lathkar	Mechanical Engineering	Material Today, Proceedings	2018	2214-7853	<a href="https://www.sciencedirect.com/journal/materials-today-proceedings">https://www.sciencedirect.com/journal/materials-today-proceedings</a>	<a href="https://www.sciencedirect.com/science/article/abs/pii/S2214785317326688">https://www.sciencedirect.com/science/article/abs/pii/S2214785317326688</a>	Scopus
45	Comparative Analysis for Hard Turning of Cryogenically treated and Non treated EN9 Work pieces by using TNMG I60408 Inserts	Kazi Razaul Aarefeen, N.A. Kadam	Mechanical Engineering	SSRG International Journal of Mechanical Engineering	2018	2348-8360	<a href="https://www.internationaljournalssrg.org/IJME/index.html">https://www.internationaljournalssrg.org/IJME/index.html</a>	<a href="https://www.internationaljournalssrg.org/IJME/2018/Volume5-Issue5/IJME-V5I5P107.pdf">https://www.internationaljournalssrg.org/IJME/2018/Volume5-Issue5/IJME-V5I5P107.pdf</a>	Scopus
46	Detection and Reconstruction of Line Scratches in Old Motion Picture	Mukkawar Vinayak and K. C. Jondhale	Electronics & Telecommunication Engineering	Journal of Emerging Technology and Innovative Research	2018	2349-5162	<a href="https://www.jetir.org/">https://www.jetir.org/</a>	<a href="https://www.jetir.org/papers/JETIR1812B21.pdf">https://www.jetir.org/papers/JETIR1812B21.pdf</a>	Yes, 63975
47	Face Recognition Using oriented Local Histogram Equalization	Ms. Wadje Jayshree and K. C. Jondhale	Electronics & Telecommunication Engineering	Journal of Emerging Technology and Innovative Research	2018	2349-5162	<a href="https://www.jetir.org/">https://www.jetir.org/</a>	<a href="https://www.jetir.org/papers/JETIR1812870.pdf">https://www.jetir.org/papers/JETIR1812870.pdf</a>	Yes, 63975
48	DRLBP based edge texture features for Object Recognition with SIFT	Divyani S. Hadoltikar and D. J. Tuptewar	Electronics & Telecommunication Engineering	International Journal of Management, Technology And Engineering	2018	2249-7455	<a href="https://www.ijamtes.org/">https://www.ijamtes.org/</a>	<a href="https://www.ijamtes.org/gallery/171.aug%20ijmte%20-%20-%20cw.pdf">https://www.ijamtes.org/gallery/171.aug%20ijmte%20-%20-%20cw.pdf</a>	Yes, 45550
49	Development of analysis curves for reinforced concrete beam sections based on simple approach of mechanics	Arshad K. Hashmi, Syed Muhammad Ibrahim, Mohammed Jameel and Alok Madan	Civil Engineering	The Indian Concrete Journal	2018	0019-4565	<a href="https://www.icjonline.com/">https://www.icjonline.com/</a>	<a href="https://www.icjonline.com/archives/2018/06">https://www.icjonline.com/archives/2018/06</a>	Scopus
50	A literature survey: A new fusion model for classification of the lung diseases using Genetic algorithm	Manisha A. Manjramkar	Information Technology	International Journal of Emerging Technologies and Innovative	2018	2349-5162	<a href="https://www.jetir.org/view?paper=JETIR1808795">https://www.jetir.org/view?paper=JETIR1808795</a>	<a href="https://drive.google.com/file/d/1R165yO85bfe4T8SgqR60wvUcbcOqZMSS/view?usp=drive_link">https://drive.google.com/file/d/1R165yO85bfe4T8SgqR60wvUcbcOqZMSS/view?usp=drive_link</a>	Yes, 63975
51	Classification of leaf diseases using texture feature and KNN classifier	Manisha A. Manjramkar	Information Technology	International Journal of Research and Analytical Reviews (IJRAR)	2018	2348-1269	<a href="https://www.ijrar.org/viewfull.php?p_id=IJRAR1903565">https://www.ijrar.org/viewfull.php?p_id=IJRAR1903565</a>	<a href="https://drive.google.com/file/d/1Y57rqP5XF6K4JQJeBy4usCbCG3j0t95/view?usp=drive_link">https://drive.google.com/file/d/1Y57rqP5XF6K4JQJeBy4usCbCG3j0t95/view?usp=drive_link</a>	Yes, 43602

  
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## EVALUATION OF ENGINEERING DEMAND PARAMETERS OF RC MULTI-STOREY BUILDING SUBJECTED TO EXTREME BLAST EVENT

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**Abstract.** Extreme occurrences, as an example blast loads and strong earthquake motion, cause nonlinear behaviour in the framework of construction and cause significant damage. For use in blast engineering with a performance-based approach, sample intensity measurements, and engineering demand parameters were presented[2]. The indirect impacts can join to hinder or forestall opportune departure, in this manner adding to additional casualties. Moreover, significant disasters caused by gas-compound explosions impose tremendous dynamic loads on many structures, a great deal more than the initial loads Because of the dangers of such extreme stacking, Over the last three decades, efforts have been undertaken to create methodology for underlying structural assessment and planning to mitigate impact loads. This Study manages analyzing the conduct of built up substantial construction under blast loading that could be useful in planning a design fit for adjusting to such impacts. The behavior of a basic multi-story building to constant axial and lateral blast loads was investigated. The response of a building to blast loads was studied using STAAD pro software. Then, a horizontal impact load was applied and the reaction of a Central and Front confronting Beams and Columns were dissected in STAAD expert by looking at its bending moments and shear forces with and without impact load and furthermore plotting appropriate charts. The research and design of blast-resistant structures necessitated comprehensive knowledge of blast processes as well as the dynamic response of various structural elements. This research provides a thorough examination of the effects of blast on structures.

**Keywords.** STAAD Pro, Blast Load, Building Response, Overpressure, Effect

### 1. Introduction

Tension or impact of a truck bomb or quarry causes the impact burst close to or inside the structure. This damages the structure both externally and inwardly (underlying frames), resulting in partition implosion, window suffocation, and the shutdown of basic life-wellbeing structures. Structures, bridges, pipelines, modern plants, dams, and so on are vital designs that play an important role in the nation's economy and must be protected from dynamic and wind stress[5].

## PREDICTING SAFETY OF THE BUILDING SUBJECTED TO BLAST LOADING USING PERFORMANCE BASED SEISMIC FRAME WORK

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### ABSTRACT

In order to kill as many people as possible and seriously harm public property, terrorists frequently use vehicle-borne incendiary bombs to attack popular landmarks and public buildings with high occupancy. While the explosion's immediate shock is what causes the majority of victims, the collapse of structural pieces may significantly raise the overall number. Most of these structures were or are being constructed without taking into account their susceptibility to such catastrophes. Performance targets are declarations the appropriate level of having casualties, direct economic loss (repair expenses), and downtime due to occupied space linked to replacement or repair of a damaged building parts in the next generation of performance-based design methods. Developing performance based standards for building blast engineering could benefit from some aspects of the performance-based seismic engineering framework. The low rise to high rise model was examined for the effects of extreme blast loads brought on by deploying TNT charges weighing 1000 kg and 500 kg at standoff distances of 20 m, 25 m, and 30 m, respectively. The Nonlinear Blast Time History Analysis (NLBTHA) was used to investigate the building's multiple performance tiers.

**Keywords:** Blast loading, Charge weight, Standoff distance, Blast Time History Analysis, Parametric study.

### 1. Introduction

Explosive loads have drawn gaining a lot of attention recently as a result of numerous unintended or deliberate incidents involving significant structures all around the world. The most prominent recent example includes tragedies similar to the American embassy bombings in Kenya, Dar es Salaam and Nairobi, Tanzania in 1998, Khobar Towers military barracks in Dhahran, Saudi Arabia, Murrah Federal Building in Oklahoma City and World Trade Centre in New York in 1996. Figure (Fig. 1) also includes a quantification of the number of fatalities and

**USING THE VULNERABILITY INDEX FOR PERFORMANCE-BASED  
SEISMIC ASSESSMENT OF REINFORCED CONCRETE FRAMES AND  
CLEARLY ARTICULATING THE PERFORMANCE LEVELS**

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**ABSTRACT**

The majority of seismic design codes used today apply a "response reduction/ modification factor" to the structure's strength and serviceability parameters in order to account for a structure's inelastic behavior. By taking into consideration nonlinear behavior and deformation limitations, this factor enables a designer to apply Force-Based Design (FBD), a linear elastic process. However, when these structures were exposed to seismic forces, it was discovered that they were damaged or collapsed, thereby raises question towards the adequacy of FBD design methodology. Performance-based Seismic Design (PBSB) as on known today is capable to overcome these shortcomings and provides procedures to evaluate and assess the performance of the structural component or whole structural system for a given seismic hazard. These procedures provide information about nonlinear incursions in structural components, but they do not clearly scale the damage state of a structural component or whole structural system in a numeric number. In present study we have attempted to provide an empirical relationship between the damage state and performance level of a structural system. For this seventy-five 2D moment resisting bare frames have been designed following the guidelines of Indian seismic codes for FBD and their performance are evaluated using performance evaluation procedures described in PBSB. The possible integration of a damage states of these frames with respective building performance levels is proposed using engineering demand parameters resulted from nonlinear analysis. The approach provides a single step verification process that uses proposed vulnerability index, which reduces the iterative efforts in quantification or scaling of damage.

**Keywords:** Damage states, pushover analysis, engineering demand parameters, vulnerability Indices

**INTRODUCTION**

The increase in urbanization has led towards the vertical growth of residential and commercial structures. These structures when subjected to natural hazards such as Earthquakes, Hurricanes and Tornados sustained structural damages and claimed major life losses. In reinforced concrete structure (RC) ductility depends on the percentage of rebars and permissible limits in



## **Seismic Performance Evaluation of Indian code-designed Concrete Moment Resisting Frames using PBSE Procedures**

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Performance-based seismic design framework has provided various procedures to assess the performance of structures exposed to seismic loads. Based on the structural and non-structural components' degree of damage, these approaches have recognized different building performance levels. The analytical compatibility of these approaches depends upon a number of parameters including modeling of structural members, location of plastic hinges, applied lateral load patterns, effects of damping and vibration's natural period. The performance-based seismic evaluation processes described in the performance-based seismic design framework are thoroughly examined in this paper. These methods are compared for a group of seventy-five reinforced concrete frames representing low, medium and high-rise structures design as per the

# Impact of seasonal Water Logging Problems and its effect in urban area: A Case Study of Nanded City, Maharashtra

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**Abstract:** Water Logging is one of the a severe problem now a days urban areas where most of areas are getting congested due to various problems and also population density is more as the demand in urban areas is very more which results the congestion of land and it get and disrupted also. Day by day as demand is increasing and also due to unauthorized site conditions or faulty designs or overloading on existing system, the sewerage and drainage system is disrupting day by day due to unscientific land use system in the city. Due to vast development of various areas, it decreases the amount of open surface and areas like low laying area which goes into submergence due to water logging. As in case of particularly in monsoon season this area get affected and turn into water logging which affect the day today life. Now days Water Logging is common problem in urban areas where population is densely situated and this problem associated with different areas of urban city due to various other problems. This work is dedicated to find out the solution for the extent of urban area which are particularly affected to the water logged conditions and find out the root solution for the same. So the analysis are made on different parameter as from different areas of waterlogged in different zones of urban area, characteristics of basin, levels of adjoining areas, storm water flows from different part of city, urban area flow drainage system and it characteristics of flow and the detail study of zone wise water logged area with the varying depth, urban transportation system and traffic situation get affected by water logging . So it also analyzed the different solutions for a waterlogged area like sump stations, modified sewerage drainage system which results into improve the socioeconomic situation in urban areas

**Keywords:** Urban area, water logging, drainage system study

## INTRODUCTION

In recent years, the removal of water caused by precipitation has become a common hazard in urban areas. Logging of water is a form of natural flooding that occurs with excessive irrigation, heavy rains and

water rising from groundwater to the surface. This leads to the displacement of water in the soil natural processes in the soil are affected and there is accumulation of toxics in the soil, which can cause problems with plant growth in the immediate area. It also occurs because of non-scientific water management and the obstruction of natural drainage systems by the construction of random embankments by disturbing the equilibrium of water inlets and outlets. The water logged is nothing but referring to soil that is saturated with water and thus cannot keep oxygen between its particles.

More often the excessive rainfall for a period of time creates water-logged situation in areas both the rural and urban areas. Water-logging problem in urban areas results into, not even structure but surround structures, environment, transportation facilities associated with it are also damaged to moderate to severe level. The drainage system which includes artificial and natural drainage helps remove surface runoff and storm water and prevents many problems such as water flow, environmental pollution; etc. Drainage in human settlements has become of considerable importance due to the huge population growth and rapid but random urbanization evident in most countries. The lack of adequate drainage is directly related to the resurgence of malaria, the spread of diarrheal diseases, damage to housing and property, disruption of communications, and environmental degradation. In this paper we have provided an overview of water logging problems at various zones in Nanded city, which is located in Maharashtra state of India. Our aims to do study of the current urban water logging in Hingoli gate area of Nanded City, trying to highlight the main causes behind it, the effects of water logging in the area and the remedial measures to counter act the water logging crises.

## Water supply in Marathwada Region: AN OVERVIEW

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### ABSTRACT

Water is an indispensable part of human existence. Despite the continuous efforts by various governments more than 12 billion people do not have proper access to pure drinking water and hygienic sanitation is unavailable for more than 3.1 billion people across the globe, especially the developing nations such as India, China, South Africa, Venezuela, Cuba, etc. are being affected at an alarming rate. In developing countries like India, there are many arid regions like Marathwada region in the state of Maharashtra. This is a semi-urban and mostly rural area of Maharashtra, which is having a main catchment of Godavari River. Still many districts from the region are facing scarcity of water during hot weather especially. Rural water supply systems play a vital role in the evaluation of prevailing systems as the major share of the population in the developing countries dwell in rural areas. Life expectancy and mortality rate of a country are majorly dependent on its water supply and sanitation system. This paper gives an overview of the existing water supply and in Marathwada highlighting the burning issues and major challenges faced by the region today.

**Keywords:** Drinking water, Water Demand, Water supply, Population.

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### I. Introduction

Water covers over 70% of the surface of the globe. Inferring that just 2% of this water is fresh, the seas make up 98% of it. Due to the presence of polar ice caps and glaciers, 1.6% of this fresh water is rendered inaccessible.

it should be dependable and secure. Poor water resource management is the other side. Well-managed water resource is essential because of its complexity and connections to other natural elements. To meet these competing needs, water resources management tries to maximize the available natural water flows, including surface



# Performance-based efficient seismic design of reinforced concrete frames with vertical irregularities

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## Abstract

Distribution pattern for the equivalent static lateral force in the seismic design process appears to be based on elastic approach. On the contrary, during extreme events such as seismic load, structures experience inelastic range. Consequently, the assumed lateral load distribution pattern for the seismic design does not remain applicable in the inelastic range. Thereby, some members of the structure go through extreme stress/deformations and the other experiences minor stresses/deformation. Current paper presents near optimum (i.e., efficient) design of reinforced concrete (RC) frames with structural irregularities applied to seismic excitations based on the model of uniform distribution of deformation and thereby damage. The efficient design is achieved by moving the material (i.e., steel reinforcement) from the members with minor deformation/damage to the member with extreme deformation/damage. The efficient design procedure for multiple performance objectives is demonstrated through the examples of irregular frames. The study illustrates that for same damage, efficient design requires less material (i.e., steel) than the design based on practicing code; again for the same amount of material (i.e. steel), efficient design gives less structural damage compared to the design based on practicing code.

**Keywords** Optimization · Performance-based seismic design · Vertical irregularities · Uniform distribution of damage · Damage index

## Introduction

Current worldwide seismic design codes consider inertia forces in lateral direction as the prominent consequences of seismic event on the structure. Thus, the stiffness and strength design of the structural members are based on the elastic mode of vibration (Hart, 2000). During extreme seismic events, the structural members are expected to experience inelastic deformations, thereby will attract forces on the member different from the assumed distribution pattern for the design (i.e., equivalent static lateral load). The optimum use of structures depends upon the best use of each members of the structure which can only be possible by the uniform stress/deformation in each member of the structure. As the forces on the members are different from the

assumed forces, some members would experience extreme deformation (i.e., overused) and some other will experience minor stresses (i.e., underused). Previous studies have illustrated the large deviation between designed equivalent storey shear and experienced storey shear forces under real ground motion (Hajirasouliha & Moghaddam, 2009). Some studies have also demonstrated the poor performance of structure designed assuming the distribution pattern of lateral inertia force in the elastic mode of vibration (Gilmore & Bertero, 1993). Chopra (2001) has showed that the structure designed by current seismic code results in disproportionate ductility demand across the structure.

Early studies have illustrated models for structural optimization in terms of performance and cost, but majority of the optimization procedure are far from practice because of intricate expressions of optimization (Feng et al., 1977; Kaveh & Behnam, 2013; Kaveh & Sabzi, 2012; Kaveh et al., 2021; Moghaddam & Hajirasouliha, 2006). Recently, an efficient performance-based seismic design of RC frame has been developed which is based on the concept of developing uniform distribution for deformation/damage demand

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# SEISMIC DAMAGE ASSESSMENT OF LOW-RISE REINFORCED CONCRETE STRUCTURE WITH PERFORMANCE-BASED SEISMIC DESIGN APPROACH

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## Abstract

Due to the failure of structures caused by earthquakes in India and elsewhere during the last 20 to 25 years and even more, attention is now being focused on earthquake unable to be affected constructions. The concept of performance-based seismic design provides a mechanism for determining the danger to life, disruption of residency, and financial loss that may have to face as a result of seismic occurrences. The purpose of this research is to assess the performance in seismic events of a R. C. structure subjected to lateral stresses. For this displacement-controlled pushover study, a gravity-based designed moment resisting frame positioned in high

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2020 Mathematics Subject Classification: 74A40.

Keywords: displacement-controlled pushover analysis, performance evaluation, displacement from roof, base shear, and ratio of drift, flexible hinge.

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## **Design of framework for multi-objective workflow planning for IaaS platform in cloud environment**

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**Abstract**---Today's, we have seen in business third party companies making huge charges to customer in cloud computing platform. So, we are providing solution for how much, we are used cloud service as per timing slots we pay to company as making assets based usages on worked and service level agreement. Despite the fact that there are many existing work process accounting calculations in common widespread or heterogeneous registration conditions, they have problems to be directly connected to the cloud situations as cloud stands out from common heterogeneous situations by its management-based asset monitoring strategy and payment -Pro- Use evaluation methods. In this paper, we have introduce such type challenges and making the model workflow of planning problem that improves both brand throughput and costs as a Multiple objective Optimization Problem (MOP) of the cloud scenarios using more than one assessment plan, event sorting or even Multi-clouds in a lonely roadmap.

**Keywords**---Scientific work process, Workflow Scheduling, Distributed computing, Multi-Objective Optimization, Genetic Algorithm.

**Introduction**

Calculating has recently become popular, and it has advanced to the point where it can provide promising stages for facilitating large-scale applications. On-request computational assets, for example, systems storage and servers, can provide from a shared asset group in a Cloud computing show with minimal

## Design of Framework for Aggregate Key Sharing Mechanism in Cloud Environment

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**ABSTRACT** The restriction to provide encryption data to various customers through open cloud storage, in particular, will ultimately reduce security constraints in the cloud scenario on unplanned data spills. The skillful organization is two-sided coding keys in key test handling some encryption arrangements. The flexibility is to provide any social concern of the selected records to a client gathering, dissimilar encryption key requests to use in each scenario for offset documents. In all cases, we have advised the need for ongoing distribution to secure customers for encryption and decryption. These customers, who stored keys securely, and appeared as a fairly large variety of catchword inputs to the cloud for remembering the true purpose of investigating data shared securely. The proposed need for secure communications, storage, and multiform existence make the philosophy clear unfounded solution. A solution to this problem has been proposed in this paper. We study all things, offering the smart idea of encryption of searchable key aggregates (KASE), multi-cloud environment schemes. We are creating the new idea through the robust KASE multi-cloud method; the info owner simply must distribute one key, to the customer for endless sharing, and show a selected key.

The single key is verified security and completion of the assessment certify that our planned arrangements are more secure and ultimately beneficial to the customer.

**Keywords:** Searchable encryption, data sharing, cloud environment storage, data privacy, etc.

### I. INTRODUCTION

Multi-cloud storage is a solution for exchanging information, upgrading to a meaningful data level. Today, different customers will exchange different types of information such as photos, videos and archives in the everyday routine, via various long-range informal contacts creating apps. These are focal points, commercial clients are often attracted to use distributed storage. However, consumers should be aware of data spills in the cloud at the same time while exchanging information data through distributed storage. Typically, business groups within the organization or other associations should share hidden data. Consider a scenario in which an administrator has to send one of the representatives, several confidential documents, so the director will assume and quantify of records in distributed storage and provide the operator with n number of encryption keys. All keys are securely stowed by the delegate. At that point, the employee will generate catchphrase trapdoor get records using these keys. So, if not well organized, considering the number of keys and the number of documents that store them safely and that create traps for each document. The group is a secondary server, which is incredibly costly. This logical issue will boost the development of a technique, which gives the employee a single accumulated key, allows access to cloud for creating one representative to any number of files.

In this article, uniqueness for encrypting searchable, multi key aggregates recommended and the rule launched by means of an incredible KASE procedure. We have proposed KASE multi-cloud scheme to combine for recognizing the distributed storage supporting, the new feature searchable knowledge collection sharing, which implies that any customer may want to get suitable a set of documents. This is a unique strategy for a collection of selected keys, allowing the last to search on the preceding catchphrase. To establish a searchable collection of information sharing, there are two principal criteria useful key administration. Basically, the data owner wants to distribute a unique complete key to the customer to share various records. The most important are to perform a keyword on the number of shared documents; the user should present a complete solitary hatch to cloud solicitations and protection situations. This is possible thanks to KASE's multi-cloud strategy.

In this publication divided into sections: Section I Introduction, Section II Related Work, Section III Systems Approach, Section IV System Architecture, Section V Output and Discussion VI Conclusion.

### II. RELATED WORK

S. Yu, C., et al. [1] [13] [14] have indicated that distributed figuring is an innovative handling viewpoint in which the enrolling system's tools are offered over the Internet as organizations. Likewise, this perspective, and as promising it is apparent, passes on different data, issue and finds the chance to screen, when customers re-fitting breakable data sharing on cloud laborers are not inside an indistinct load of information proprietors in space. Current courses of action typically apply cryptographic methods to keep vulnerable customer data secret against servers by exposing data unscrambling keys, far too verified customers [19] [20]. By the way, perpetually, these approaches show an

Original Article

# An Efficient Flower Classification System using Feature Fusion

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**Abstract** - Automatic classification of flowers is essential in research on flowers, medicinal use of flowers, flower patent analysis etc. Traditionally, flower classification is done using low-level features like color, shape, texture and geometry. There exist large intra-class variation and interclass similarity among flower classes. Search engine-based flower identification and classification system are not efficient and robust because they are based on visual search. The accuracy and robustness of flower classification depend highly on the feature descriptor. Deep features have shown excellent performance in the last few years on high-resolution images, but they cannot extract accurate global features from low-resolution images. Hence, an efficient flower classification system using a fusion of handcrafted features and deep features is proposed in this paper. Low-level features are extracted using Color Coherent Vector (CCV), Centre Symmetric Local Binary Pattern (CSLBP) and Edge Histogram Descriptor (EHD). Deep features are extracted from pre-trained networks: ResNet-50 and AlexNet. Further, a Multiclass Support Vector Machine (SVM) is used to yield high classification accuracy. Experiments are carried out on Oxford Flower 17, Flower102, Kaggle flower dataset and Corel-1K dataset. Classification accuracy of 100, 95.3, 94 and 92% is obtained on the Corel dataset, Oxford Flower 17, Kaggle flower dataset and flower 102 dataset, respectively, which is better than existing approaches. A remarkable achievement in classification accuracy of 86.4% is observed on the pooled dataset.

**Keywords** - Deep Learning, Image descriptor, Convolutional Neural Networks, Image classification, Pooled dataset.

## 1. Introduction

Flowers are an integral part of our ecosystem. They are mainly used in floriculture, the cosmetic industry and herbal medicine. Given several flower images, it is very time-consuming to identify flower species manually. Automated flower classification is challenging due to a large number of similarities among classes, the complex structure of flowers and the unpredictable variety of flower classes in nature. Flower image classification is a vibrant research area in image processing and computer vision. Plenty of classifiers have been proposed in the recent past for different applications. Most traditional classifiers use local, global or both types of image features. Low classification accuracy due to inadequate feature descriptors is the major limitation of these methods. Ala et al. [1] used RGB color moments, HSV color histogram, Gray level Co-occurrence Matrix (GLCM) texture features, Scale Invariant Feature Transform (SIFT) key points, and Histogram of Oriented Gradients (HOG) features for flower classification. The authors observed a success rate of 83.5 % for the Flower 17 dataset with the SGD classifier.

Most of the traditional methods require various pre-processing techniques. This is very challenging. Therefore many researchers have automatically done feature extraction instead of using manual methods. Deep learning has provided excellent results in the applications of computer vision like

object detection, image segmentation, image classification etc. Different neural layers process an enormous amount of data in deep CNNs, like the human brain. Deep features are very much valuable for image classification.

Tian et al. [2] classified images from Flower 17 dataset using the data augmentation method with their CNN model. The classification was done using the Softmax function. The authors reported a classification accuracy of 92%. M. Ghazi et al. [3] employed pre-trained AlexNet, GoogleNet and VGG-16 CNNs for the flower classification. They used the image augmentation technique to obtain the new augmented image dataset and observed an accuracy of 80%. However, due to low resolution, interclass similarity and intra-class variety among flower classes, it is very challenging to classify the images correctly.

It is observed that no single feature extraction method is sufficient for flower image classification. To tackle this issue, a new method using the fusion of handcrafted features and deep features to improve the classification accuracy of flower images is proposed in this paper. Handcrafted features are extracted using CCV[4], CSLBP[5] and EHD [6] and deep features are extracted using ResNet-50 [7], and AlexNet [8] and the final feature descriptor is obtained by fusion of handcrafted features and deep features in this research. Classification is done using a multiclass SVM classifier [9].



# SEISMIC DEVELOPMENT AND STUDY OF FRAGILITY CURVE

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**Abstract -** For an earthquake with spectral intensity corresponding to weak shaking, the exceedance probability for the small affect is pretty substantial along with the amounts defined by excessive damage states like average, Extensive, complete are negligible. Whereas if there's an earthquake of good intensity the structure is much more apt being crossed the destruction states of moderate and slight, From the derived fragility curves, it's found that seismic vulnerability is substantially influenced by the structural irregularity, so the PGA/PGV ratio of ground movements features a noteworthy impact on the fragility curves. The numerical outcomes certainly indicate that space RC frame structures start to be much susceptible to earthquake damage as the program irregularity increases. This agrees nicely with a lot of the prior investigation results as well as the actual damage observed in previous earthquakes. Structural irregularity is definitely the one of the main factors behind the failure or maybe collapse of components, therefore significant focus must be paid out when conducting seismic vulnerability evaluation. This particular analysis aims to derive much more correct as well as proper seismic fragility curves for space RC frame structures with various degrees of plan irregularity with the three-dimensional models of theirs and check out the impact of structural irregularity on theseismic vulnerability.

**Keywords —** Seismic Analysis, Fragility Curve, Reinforced Concrete Structures

## I. INTRODUCTION

### 1.1 Fragility Curve

A fragility analysis is an effective tool for vulnerability assessment of structural systems. The fragility curve, which is developed from the behavior model of structure, capacity and a suite of ground motions, is a graphical representation of the seismic vulnerability of a structure It shows common fragility curves for different limiting values for damage Parameter. The intensity measure here's the spectral displacement of the earthquake. As the limiting value enhances the curve shifts towards properly and gets to be more level. From the figure it could be observed that at weak shaking the probability of exceedance with the cap state corresponding too little damage is rather high. For powerful earthquakes probability of exceedance is 100 % for the very first curve, meaning small damage is extensive, moderate, and sure damages will probably occur. But probability that total damage will occur is very low. Regions of different damage states including slight, moderate, Complete and extensive damages are marked in between each fragility curves. With the severity of

damage, the parameter defining the maximum state of damage improves, & the exceedance probability decreases.

For an earthquake with spectral intensity corresponding to weak shaking, the exceedance probability for the small affect is pretty substantial along with the amounts defined by excessive damage states like average, Extensive, complete are negligible. Whereas if there's an earthquake of good intensity the structure is much more apt being crossed the destruction states of moderate and slight. The exceedance likelihood for the extensive damage state is much more than that of total damage state.

### 1.2 Theoretical Background

Earthquakes cause economic losses apart from the torturous pain of loss of lives. Seismic risk assessment is the first step within the disaster prevention strategy and in reducing the associated risks of infrastructures. The comprehensive study of seismic risk is often divided into 3 components- Hazard, Vulnerability and Exposure. Hazard is that the event capable of inflicting harm whereas

# SEISMIC PERFORMANCE EVALUATION AND FRAGILITY ANALYSIS OF REINFORCED CONCRETE STRUCTURES

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**Abstract** - Fragility curves deliver the conditional probability of structural effect when subjected to earthquake lots as a characteristic of ground motion intensity or maybe other design parameters. Seismic fragility curves are utilized primarily by decision makers for the evaluation of seismic losses all for pre earthquake disaster preparation and post-earthquake restoration programs. Model of fragility curves in standard techniques consists of development of large quantity of computational versions which stand for the inherent variation in the material of specific construction style as well as its earthquake time history analyses to a qualities a qualities reliable and accurate estimation of the probability of exceedance of the selected injury parameter. Since substantial damages to structures having structural irregularity of their designs had been frequently noticed during several previous earthquakes, there are actually excellent research initiatives to assess the seismic vulnerability of theirs. Although the majority of the prior studies used simplified structural representations for instance two-dimensional or one-dimensional types in the fragility analysis of plan irregular structures, easy analytical versions couldn't represent accurate seismic behavior coming from the complex nonlinear coupling between torsion and lateral responses as the level of irregularity greater. For room constructions with good irregularity, much more reasonable representations including three dimensional models are essential for proper seismic evaluation. However, the usage of computationally expensive models isn't practically doable with existing methods of fragility analysis. Consequently, in this particular study, an alternative strategy is adopted that could produce vulnerability curves efficiently, despite a three dimensional design. In this particular approach, an integrated computational framework is established that combines structural analysis and reliability analysis. This enables analysis of the limit state fraction without any constructing the explicit formula of its, and the failure probability is calculated with the first order reliability technique (FORM) to cope with the computational challenge. Under the integrated framework, this particular analysis investigates the seismic vulnerability of space reinforced concrete frame structures with different plan irregularity. Material anxiety is recognized as along with much more symbolic seismic fragility curves are derived with the three-dimensional analytical models of theirs. The usefulness of the adopted approach is reviewed, and also the substantial impact of structural irregularity on seismic vulnerability is highlighted.

**Keywords** — *Seismic Performance, Fragility Analysis, Reinforced Concrete Structures*

## I. INTRODUCTION

### 1.1 Fragility Curve

For an earthquake, vulnerability evaluations of structures are usually carried out for judging the necessity for

strengthening important facilities and buildings against eventually earthquakes. The simplest way to do such assessments is Fragility curves. Fragility curves epitomize the conditional probability that a result of a specific framework might surpass the functionality cap in certain

# Assessment of the Capability of Moment Resisting Frames using Force-based and Displacement-based Approaches

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**Abstract** - Experience learnt from damages occurring to the building during past-earthquakes showed the inadequacy of forced based methods. With increase in knowledge of seismology and the soft computing tool availability leads towards the development of displacement-based methods. Displacement based design techniques proved to be the best alternative device for performance-based seismic design. Of the various available displacement-based design methods had not guided about the appropriate standards for usage in design practices in cognizance to the recent trends of building configurations. Present study focuses on the use of the direct displacement-based for design of Moment Resisting frame subjected to gravity loads. Example frames consist of 4, 8 and 12 stories design as per BIS 1893:2002 using force-based and displacement-based design approaches. The performance evaluation of example moment resist frames is done using nonlinear static pushover analysis. The obtained results are compared with force-based and displacement-based approaches in terms of base shear, story drift, and number of hinge formation for achieving the structural performance level.

**Keywords** — *Performance based design, force-based design, direct displacement-based design, push over analysis, parametric studies*

## I. INTRODUCTION

Recent years, more importance has been given to "performance" instead of "strength" for structures prone to seismic hazards. This has demanded alternative design methodology based on deformation rather than force. These are named as Performance-based seismic design (PBSD) philosophies. These philosophies show the attainment of inelastic displacement for every incremental increase in applied lateral loads.

Force-based design (FBD) procedure adopted in most of the seismic design codes allows the design of building structures using elastic design spectra. A fundamental problem with the FBD method is the selection of the appropriate member stiffness. In preliminary design member sizes are designed for gravity loads before the evaluation of design lateral forces. These lateral forces are calculated on the basis of seismic weight distribution over the height of building, if member size is varying from the initial assumption, then the calculated force is no longer

valid, and recalculation required, thus making it an iterative process.

Researchers have pointed out that force is a poor indicator of the damage and that there is no clear relationship between the strength and the damage [Priestley, 1993, 2000 and 2003]. Hence, the force cannot be a good criterion for design. Further, assuming a rational value of the response reduction factor for a class of buildings is not realistic, because ductility depends on so many factors, such as degree of redundancy, axial force, steel ratio, structural geometry etc. To overcome this limitation of the FBD, an alternative design philosophy named "Displacement-Based Design (DBD)" has been put forth [Qi and Moehle, 1991], The proposed DBD includes the use of the translational displacement, rotation, strain etc., in the basic design criteria. Later improvements in DBD were suggested in Direct Displacement Based Design (DDBD) [M.J.N. Priestley, 1993]. The DDBD is based on Performance-based Design (PBD). PBD involves the design of structure on the basis of damages sustained by

# On Assessment of Nonlinear responses of Medium-rise 3D RC Frames using Performance Evaluation Methods suggested in FEMA 440

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**Abstract** - It has become necessary to evaluate the seismic capability of medium-rise buildings to quantify the associated repairs, casualties and downtime of usage of property for a predefined seismic hazard. This ensures safety for both structure and occupants life. The present study focuses on a parametric analysis of nine storied 3D-bare frame using performance-based seismic evaluation procedures. The example building is designed as per the guidelines of IS 456 and IS 1893 for gravity loads. The engineering demand parameters used in the performance evaluation are obtained from nonlinear static analysis performed on the example frame subjected to different lateral load patterns. The obtained results have been validated through correlation with the permissible values documented in FEMA 440. The entire procedure used in the study provides a short hand procedure for stakeholders engaged in seismic design engineering.

**Keywords** — Medium-rise building, Performance-evaluation techniques, Pushover analysis, Parametric study

## I. INTRODUCTION

The modern infrastructural development demands for the multi-storied structures. These multistoried structures show multiple performances, both at the global and local levels when subjected to inertia loads. The inertia loads acting on the structure are due to wind and seismic forces [1-6].

Contribution of research and experimental studies done in the field of seismic engineering has improved the seismic design and assessment procedures. With the intention to communicate the safety-related decisions to the stakeholders, the design engineers have shifted their focus towards the predictive methods of the seismic design. This resulted into the development of PBSD [4].

Present seismic design codes are incapable to describe the nonlinear modeling parameters for a reinforced concrete structure, but they provide the limits for strength and serviceability [1-6]. Federal Emergency Management Agency (FEMA) in association with Applied Technical Council (ATC) has put forth various nonlinear modeling methods and performance evaluation techniques for the assessment of seismic capability of reinforced concrete structure or member [7-10]. The framework is known as, Performance-based Seismic Design (PBSD). PBSD document has presented various performance evaluation techniques using linear and non-linear analysis procedures [11]. The various building performance levels and structural performance levels described in PBSD framework are illustrated in Table 1-3.

This performance evaluation methodology is a three step procedure. In the first step, monotonically increasing lateral loads are applied up to the target displacement. From this capacity spectrum of the structure is obtained. Secondly the demand spectrum of the structure is obtained based on inelastic demand, soil parameters and assumed damping. In Third step the intersection of capacity spectrum and demand spectrum is done to evaluate the performance point, which validates the inelastic capability of the structure at global level. The local level performance is assessed through moment-curvature relation of structural components.

Table 1: Building performance levels as per ATC 40[7]

Non-structural Performance Levels	Structural Performance Levels					
	SP1 IO	SP2 DCR	SP3 LS	SP4 LSR	SP5 SS	SP6 NC
NP-A (Operational)	1-A	-	NR	NR	NR	NR
NP-B (Immediate Occupancy)	1-B	-	-	NR	NR	NR
NP-C (Life Safety)	-	-	3-C	-	-	-
NP-D (Hazard Reduced)	NR	-	-	-	-	-
NP-E (Not Considered)	NR	NR	NR	-	5-E	NR

NR = Not Recommended performance levels

The various performance evaluation method documented in FEMA are; (1) Capacity Spectrum Method (CSM), (2) Displacement Coefficient Method (DCM), (3) Improved

# Agriculture Cyber Physical System for Crop Recommendation

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**Abstract:** Agriculture plays a significant role in the Indian economy. Agriculture employs more than 60% of India's population, and agriculture generates one-third of the country's revenue. As a result, it plays a vital part in the country's development. A variety of agricultural difficulties continue to hamper the country's progress. Choosing modern agriculture that integrates modern styles could be one solution to these issues. As a result, Agriculture Cyber Physical Systems, which combine IoT with other technologies such as Artificial Intelligence and Machine Learning, can make agriculture smarter.

The Agriculture Cyber Physical System can help in increasing crop yields, reducing water waste, and reducing fertilizers overuse, among other things. This study is different in that it measures variety of aspects of the agricultural field that have a direct impact on crop choices. Second, it sends this information to a server, which then uses it to forecast farm-ready yields.

**Keywords:** Agriculture Cyber Physical System, IOT, Artificial Intelligence, Machine Learning., etc.

## I. INTRODUCTION

In this advanced world, the majority of farmer have absence of legitimate information in regards to cultivating and horticulture making it difficult. Most piece of cultivating and farming related exercises depend on expectation and anticipation. At the point when it fails, farmer needs to bear huge losses. With depleting resources, reducing land sizes and increase in input and labour costs, combined with the uncertainty of various factors like weather, market prices etc., agriculture in India has become a profession which is full of risks. The advancements in technology must be worked upon across various disciplines and it's already shown dramatic improvements in many fields. Agriculture, on the other hand, has not got the benefit of such innovations. Our intention from this project is to at least one part of agriculture processes, that is selection of best crop for the farm. Traditionally farmers select the crop based on various factors such as market demand, and for the convenience farmers select the crop which gives most profit and requires less investment, this results to a problem of monoculture. Monoculture is that the agricultural practice of growing one plant species across a huge acreage. Instead of growing a spread of crops, as farmers have done throughout most of human history, they instead tend to land that produces only one type of crop.

### A. Agriculture Cyber Physical System

In its most basic form, a Cyber Physical System (CPS) is a platform that consists of a mechanical system controlled by computer algorithms and is strongly connected with the Internet and its networked users. The platform's physical-mechanical components, which are represented by smart sensors and actuators, and software components, which are represented by computer and networking devices, are inextricably linked. Agriculture cyber-physical systems (ACPSs), or CPSs built and used in agriculture, may collect fundamental and timely information with high granularity on the climate, soil, and crops, allowing for more accurate agricultural management systems.

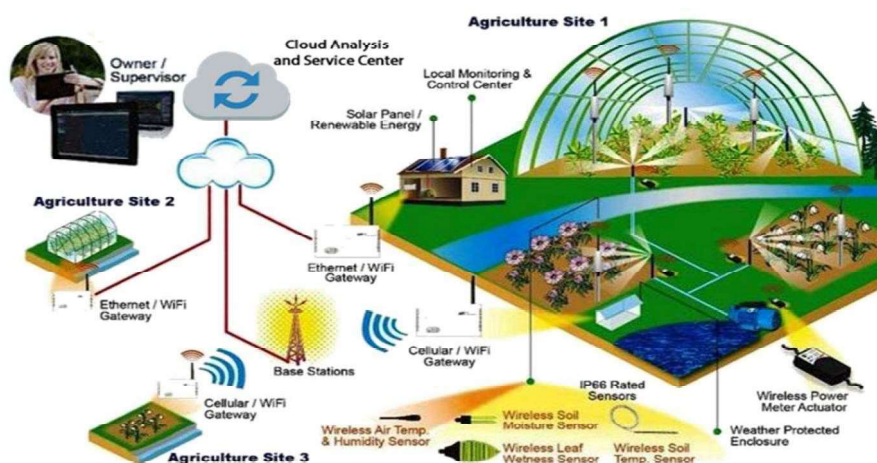


Fig 1. Agriculture Cyber Physical System

# Design and Development of Hydraulically Operated Torx Key Manufacturing Machine

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**Abstract:** The scant documentation available indicates that the idea of a hex socket screw drive was probably conceived from the 1860s to the 1890s, but there were no such screw manufacturers till 1910. This Torx key is used to drive bolts and screws with hexagonal sockets in their heads. Torx is a type of screw drive characterized by a 6-point star-shaped pattern, developed in 196 by Camcar Textron. A popular name that is generic, for the drive is a star, as in star screwdriver or star bits. Torx key is used generally to unlock the Torx screws. This paper shows the Manufacturing of Torx key machine using a hydraulic system, its circuit design, and 3D modeling of the machine using Autocad Fusion 360.

**Keywords:** Torx key, Mini Press, Hydraulic Press, Embossing dies.

## I. INTRODUCTION

Torx screws are used in automobiles, motorcycles, bicycle brake systems (disc brakes), hard disk drives, computer systems, and consumer electronics commonly. In the beginning, they were used in applications requiring tamper resistance in some ways, but since the drive systems and screwdrivers were not available widely; as drivers became more common, tamper-resistant variants, as described below, were developed. Torx screws are also becoming popular dynamically in many industries.

Torx is a trademark for a type of screw drive characterized by a 6-point star-shaped pattern, developed in 196 by Camcar Textron. A popular name that is generic for the drive is a star, as in star screwdriver or star bits. The official generic name which is standardized by the International Organization for Standardization as ISO 10664, is hexalobular internal. Sometimes, this is compacted in databases and catalogs as 6 lobes (starting with the numeral 6, not the capital letter G). Torx Plus, Torx Paralobe, and Torx tap are improved head profiles.



Fig. 1 Torx key (Product)

### A. Problem Statement

Laxmi Tool Corporation is a Nashik based tool manufacturing company who supply various type of tools for CNC, VMC machines, tool holders, spare machine parts, and customized machines. While providing tools holders to the customer they need to supply an extra torx key with each tool holder they supply to the customer. They have to buy this torx key, which causes extra cost, reducing profitability etc., they want to manufacture torx key in house.

### B. Objective

This project will have following objectives to achieve while designing the torx key manufacturing machine:

- 1) Cost reduction through in house manufacturing of torx keys.
- 2) Designing industry friendly machine systems.
- 3) Selecting machine components through market survey.
- 4) Optimum performance of Machine Elements.
- 5) Connecting theoretical knowledge with practical one.

# Influence of Different Lateral Load Resisting Structural Systems on Seismic Performance

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## ABSTRACT

A natural hazard like earthquake causes damage or collapse of buildings if not designed for lateral loads resulting due to earthquake. Hence to resist the lateral loads in high rise structures it is important to provide exclusive Lateral Load Resisting System (LLRS) which will improve the behaviour of moment resisting frames. Using an appropriate Lateral Load Resisting system is critical to ensure good seismic performance of buildings. In present study, a square plan of 160m tall building with 40m each plan side, having 40 storeys, each storey height is 4m is considered. The analysis has been carried out using software ETAB-2015. In present work, analysis is carried out to study the influence of different lateral load resisting systems i.e. Traditional system, Tube system, Tube-in-Tube System and Bundled system. The modelling is done to examine influence of different lateral load resisting systems on seismic parameters like shear lag effect (difference in column axial forces), maximum lateral displacements, maximum lateral drifts ratio and fundamental natural time period.

**Keywords** – Traditional system, Tube system, Tube-in-Tube System and Bundled system.

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## I. INTRODUCTION

Using an appropriate structural system is critical to good seismic performance of buildings. While moment-frame is the most commonly used lateral load resisting structural system, other structural systems also are commonly used like structural walls, frame-wall system, and braced-frame system. Sometimes, even more redundant structural systems are necessary, e.g., Tube, Tube-in-Tube and Bundled Tube systems are required in many buildings to improve their earthquake behavior. These structural systems are used depending on the size, loading, and other design. Different Lateral Load Resisting Systems are mentioned below.

**(1.1) Traditional System:** Special Moment Resisting frames consist of a grid of vertical (*i.e.*, columns) and horizontal (*i.e.*, beams) Members. They resist lateral loads through axial forces, bending moment and shear force generated in both beams and columns. In the traditional frame building with the central core (figure 1), most of the lateral forces are carried by the central reinforced concrete core. The load transfer path carries the forces to the concrete core. As the lateral force travels down towards the base of the building, the force flows

towards the more stiffened corners of the core in the form of axial tension and compression. Thus, the corners of the core at the base of the building carry larger axial force than the mid sides of the core.

**(1.2) Tube System:** Closely-spaced heavy columns forming a closed loop inter-connected with beams, together called the tube (figure 2), and forms the first part of the lateral load resisting system. Heavy reinforced concrete structural walls together creating a closed shaft, called as the core, form the other part. The Tube System consists of one perimeter tube with a central core. The inter-connection is important between the perimeter tube and the central core. For smooth and uniform transition of lateral forces to the peripheral frame, a grid of stiff and strong beams and columns is required. The perimeter tube helps to carry lateral forces away from the central core to the perimeter tube.

**(1.3) Tube-in-Tube System:** When the plan size of the building increases, additional columns may be required to support the gravity loads between the outer tube and inner core, and prevent the slab from bending too much. These columns are not part of the main lateral load resisting system, and therefore are not intended to carry any lateral loads; they are called gravity columns. When the building plan is large,

# Parametric Study of Factors Influencing Mode Shape of Oscillation

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## ABSTRACT

The mode shape of oscillation associated with a natural period of building is the deformed shape of the building when shaken at the natural period. Hence, a building has as many mode shapes as the number of natural periods. The deformed shape of the building associated with oscillation at the fundamental natural period is termed its first mode shape or fundamental mode shape of the building. In this study, an attempt is done to understand the various parameters which affect the fundamental mode shape of RC building. The parametric study is done as per the provision of Equivalent Static Lateral Force Method; IS1893 (Part-1): 2002. In this present work, a reinforced concrete special moment resisting frame building models are prepared and analyzed in ETAB software to evaluate the effect of stiffness of structural elements, the effect of degree of fixity at member ends, the effect of building height, and the effect of unreinforced masonry on fundamental mode shape of buildings. Normalization-scaling technique is used in which data points are shifted and rescaled so that they end up in a range of 0 to 1. Building height and Storey Lateral Displacement are normalized in a range of 0 to 1. To calculate the Normalized mode shape, the maximum lateral displacement of the top story is considered as 1 and the remaining story displacement is calculated in proportion to 1. Similarly, the total building height is considered as 1 from the base and the remaining floor height is calculated in proportion to 1.

**Keywords** – Equivalent static method, Mode Shape, Infill panel, Flexural Stiffness

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## I. INTRODUCTION

A mode shape is a deflection pattern related to a particular natural frequency and represents the relative displacement of all parts of a structure for that particular mode. Buildings oscillate during earthquake shaking. The important dynamic characteristics of buildings are modes of oscillation and damping. Mode Shapes of Buildings depend on Overall Geometry of Building, Geometric & Material Properties of Structural Members, and Connections between the Structural Members and the Ground at the Base of the Building.

### 1.1 Mode Shape

Mode shape of oscillation associated with a natural period of a building is the deformed shape of the building when shaken at the natural period. Each node is free to translate in all the three Cartesian directions and rotate about the three Cartesian axes. Hence, a building has as many mode shapes as the number of natural periods. For a building, there are infinite numbers of natural period. But, in the mathematical modeling of building, usually the building is discretized

into a number of elements Regular buildings have these pure mode shapes. Each node is free to translate in all the three Cartesian directions and rotate about the three Cartesian axes

Irregular buildings (i.e., buildings that have Irregular geometry, non-uniform distribution of mass and stiffness in plan and along the height) have mode shapes that are a mixture of these pure mode shapes.

### 1.2 Fundamental Mode Shape of Oscillation

There are three basic modes of oscillation, namely, pure translational along **X-direction**, pure translational along **Y-direction** and pure rotation about **Z-axis** (Fig 1.1). Regular buildings have these pure mode shapes.

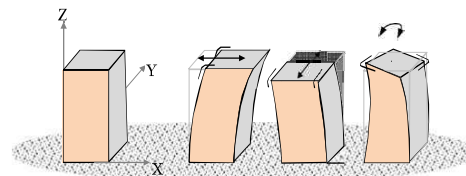


Figure 1.1: Basic modes of oscillation: Two

## Influence of Different Lateral Load Resisting Structural Systems on Seismic Performance

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## Study of Mechanical properties of Epoxy composites filled with Graphite & TiO<sub>2</sub>

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### ABSTRACT

Epoxy Based Resin filled with Graphite particle & TiO<sub>2</sub> particle were made by hand layup technique. Tensile strength, Flexural strength, Impact, hardness & density were determined as per ASTM D 256, ASTM D 792, and ASTM D 2240. Composite containing 3 wt % of graphite particle exhibits the optimum mechanical & wears performances. A further increase in the graphite content increases the specific wear rate & deteriorates the mechanical performance. The performance of composites can further be improved by adding TiO<sub>2</sub> filler in polymer. The present work includes the processing & mechanical characterization of the composite. The experimental results showed that as TiO<sub>2</sub> increases (upto 4 to 5 wt %) density, hardness, Tensile strength & Flexural strength also increases & Impact strength decreases after increase in TiO<sub>2</sub>. The systematic experimentation leads to determination of significant process parameters & material variables that predominantly influence the mechanical properties.

**Keywords** - Epoxy, Graphite, TiO<sub>2</sub>, Mechanical Properties.

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### I. INTRODUCTION

Epoxy Resin is one of the most versatile polymers. Epoxies are most widely used family of thermoset large portion of them has been used for applications that do not require it to be reinforced (adhesives, paints, etc) the major application of reinforced epoxies is in circuit boards. Many advanced composites use epoxies because of their high thermal stability, adhesion & mechanical properties. It can be used for the aerospace structures, organic coating & common adhesives for domestic application. Mechanical test methods were used to investigate the mechanical properties of epoxy resin system. These tests are made to evaluate general performance & behavior of the epoxy resin system. Numerous researchers have modified wear resistance by lowering coefficient of friction of thermoplastic / thermoset resins with suitable solid lubricants. The influences of graphite content on mechanical properties of these composites were examined.

Polymer based composite have been extensively used in tribological applications because of their light weight, ease of fabrication, excellent specific strength, corrosion resistance, design flexibility, etc. Fiber reinforced polymer composites have been extensively used in automotive & aerospace application for making components such as gears, cams, Wheels, brakes, bearing liners,

rollers, seals, clutches & bushing. Polymer composites with fibers or solid lubricants have been used in case of components where external lubrication is practically not feasible, some solid lubricants such as polytetrafluoroethylene (PTFE), molybdenum disulphide (MoS<sub>2</sub>) & Graphite (Gr) have excellent wear resistance & anti friction abilities & commonly used in environment where fluid lubricants are ineffective.

(Basavarajppa & Ellangovan 2012) have studied the effect of adding fillers namely Gr into epoxy composite systems. They reported that addition of Gr has considerably reduced the specific wear rate of epoxy composites. (Shivamurthy) have mentioned that 3 wt % Gr into epoxy/glass multilayered laminates has led to the enhancement of both mechanical & dry sliding wear performance of laminates. However Gr beyond 3 wt % deteriorated both mechanical & dry sliding wear properties. The formation of clusters of Gr at higher filler content was cited as main reason for deterioration in properties of epoxy/glass laminates. Incorporation of solid lubricant (Gr) as secondary filler resulted in improvement of both mechanical & tribological properties of composites.

TiO<sub>2</sub> is a conventional filler material & is used extensively for developing new materials. It has strong potential as coating material with linear coefficient of thermal expansion & elastic modulus. TiO<sub>2</sub> has been used in combination with

# Seismic Vulnerability Assessment of Regular and Irregular RC Buildings using Pushover Analysis

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**Abstract** - With the increasing demand of urbanization in developing countries has raised the need for the construction of medium-rise and high-rise buildings. Safety of both structure and life during a seismic event has become a prime focus of structural engineers. Preliminary seismic risk assessment tools are often used to screen the new and existing structures against the potential seismic hazards. The geometric profile of a structure and the applied loading patterns influences the performance of structures during a seismic event. Among these vertical irregularities arise due to the irregular distributions in mass, stiffness and strength along the height of a structure has gained major importance. Soft story (Open floor) is a common irregular building configuration in practice in India and represents a significant source of serious seismic damage, when subjected to severe earthquakes. The Present study focuses on evaluation of performance of medium-rise building with soft storey using pushover analysis. From the results of pushover analysis a vulnerability index has been introduced to evaluate damage to the structure. An attempt is made to scale the damage value with the attainment of the performance level defined in performance-based seismic design codes. This vulnerability index can be used as a preliminary risk assessment tool.

**Keywords** — Structural Irregularities, Pushover analysis, Vulnerability index, Example MRFs, Seismic assessment

## I. INTRODUCTION

Earthquake is one of the most unpredictable and devastating natural hazards. The force-based design methods allows to design the structures which are capable of sustaining minor damages during minor or moderate earthquakes, but they were get collapsed when subjected to severe earthquakes. This questions the adequacy of the available seismic codes to provide the safety to both life and structures. The structural engineers and associated stakeholder who are engaged in the earthquake resistant design has a prime concern towards the performance evaluation and damage assessment of reinforced concrete (RC) structures subjected to seismic hazards. The structural engineers and associated stakeholder who are engaged in the earthquake resistant design has a prime concern towards the performance evaluation and damage assessment of reinforced concrete (RC) structures subjected to seismic hazards [1].

During seismic event the RC structures are subjected to inelastic incursions, which demands effective analysis procedures to evaluate its multiple performance levels. Performance-based seismic design (PBSD) has put forth various building performance levels based on the damages sustained by structural and non-structural components. Figure 1 shows various building performance levels and ranges described in PBSD [2-6]. PBSD has also provided

four analysis procedures; Viz. linear static and dynamic and nonlinear static and dynamic. Among these first two are forced-based. Three and four are displacement-based. The nonlinear methods have been used to evaluate performance of RC structures under seismic loads. Nonlinear dynamic method accounts for changes in structural parameters during cyclic loading, but involves complex procedures. While nonlinear static procedures are simple and their results are closer to that of dynamic procedures. PBSD document has proposed various performance evaluation procedures based on nonlinear static procedures (pushover analysis, POA), namely the capacity spectrum method and displacement coefficient method [7].

In capacity spectrum method, the structure is subjected to predefined lateral load pattern with monotonically incremental steps till a target displacement is reached. The response of structure is plotted for rooftop displacement and base shear known as capacity spectrum. The inelastic demand spectrum is obtained for the stated time period and damping coefficient. The intersection of this curve provides performance point which defines the level of seismic performance. Figure 2 describes the CSM procedure [1-3]. While in the displacement coefficient method (DCM) is the simplest method of obtaining target displacement. The method does not involve the conversion of capacity curve into corresponding spectral coordinates. The linearization

# Performance Evaluation of Moment Resisting Frames with SCWB and WCSB Configurations using Performance-based Seismic Procedures

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**Abstract** - In the earthquake resistant design, reinforced concrete sections are designed to carry the gravity and inertia loads within the predefined serviceability limits. The performance of structure under seismic events depends on the size and layout of beam and columns. In the past, several studies were conducted on reinforced concrete structure with both strong column weak beams (SCWB) and weak column strong beams (WCSB) to evaluate the capacity subjected to seismic loads. Also, some studies have been performed on layout of such cases of beams within the plan. In this study attempt has been made to evaluate the performance of moment resisting frames with different configurations of SCWB and WCSB under the performance-based seismic design framework. A parametric study on engineering demand parameters such as modal time period, modal frequencies, storey displacements, inter-storey drift and base shear has been carried out. The results obtained from this parametric study helps to find out the efficacy of the frames integrated with the collapse mechanism and performance levels defined in performance-based design framework. This parametric study provides an easy way of benchmarking the performance of a structure, which may be used in obtaining various design alternatives.

**Keywords** — Strong column-weak beam, weak column-strong beam, nonlinear static pushover analysis, modal time period and frequency, base shear, storey displacement, inter-storey drift.

## I. INTRODUCTION

The earthquake resistance design methodologies defined in the relevant codes are force-based [1]. The structure which was designed using force-based design procedure, when subjected to the seismic loads show poor performance and sustained minor or major damages, in extreme events they were collapsed [2, 3].

MRFs are used as part of seismic force-resisting systems in buildings that are designed to resist earthquakes. Beams, columns, and beam-column joints in MRF frames are proportioned and detailed to resist flexural, axial, and shearing actions, resulted from the lateral sway during strong earthquakes. Special proportioning and ductile detailing makes the MRF capable of resisting strong earthquake without significant loss of stiffness or strength. In current usage, the MRF are capable of resisting at least 25 % of the design seismic forces, while the total seismic resistance is provided by the combination of the moment frame and the shear walls or braced frames in proportion with their relative stiffness's [4].

The collapse mechanism of MRF depends on the capacity of a structural member. Either the lines of resistance will be governed by the beam failure envelope or

column failure envelope. To understand these effects it's needed to evaluate the performance of MRF with Strong Column Weak Beam (SCWB) or Weak Column Strong Beam (WCSB) structural assemblage. In this study, we have evaluated the performance of MRF with SCWB and WCSB configurations. Also, the performance of MRF for alternate layout of beams such as Strong-Weak-Strong (SWS) and Weak-Strong-Weak (WSW) has been studied.

Performance-based seismic design (PBSD) has emerged as the best alternative over the force-based design procedures. PBSD is a generalized design philosophy in which design criteria are expressed in terms of achieving stated performance objectives when the structure is subjected to the stated levels of seismic hazard [5]. PBSD defines various performance levels based on damages sustained by the structural and non-structural components in a seismic event. Namely, Operational level (OP), Immediate Occupancy level (IO), Life-safety range (LS), Collapse prevention (CP) and Collapse (C) identified on the basis of drift. These performances are evaluated at global level and local level. For the global performance level inter-storey drift and storey displacements are used. Wherein; for the local performance level assessment the curvature or

# Evaluating the Effects of Plastic Hinge Location on Performance of the Moment Resisting Frames subjected to Seismic Loads

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**Abstract** - Performance-based seismic design has adopted nonlinear static analysis method for the performance evaluation of a structure subjected to seismic loads. In nonlinear static analysis, the structure is subjected to the incremental lateral loads, until the target displacement is reached. The inelastic properties of reinforced concrete sections are introduced by the use of plastic hinges. Many past researches have contributed towards the understanding the effects of location of plastic hinges in performance evaluation. These efforts were made on the basis of the structural characteristics of reinforced concrete members. With the development of finite element based computing tools it became easier to analyze such complex behavior of structures. For inelastic modeling it's needed to define the permissible limits of drift, curvature or rotations of structural components and the location of plastic hinges. The permissible limit of drifts, curvature and rotation are specified in the guideline documents along with the performance levels, but does not clarify about their locations. In this study efforts are made towards the finding out the approximate locations of plastic hinge, so as to attain the reasonable level of performance of the structure when subject to seismic loads. For this example moment resisting frames, designs for the gravity loads were subjected to the set of lateral loads and their parametric study is done.

**Keywords** — Moment resisting frames, plastic hinges, nonlinear static procedures, parametric studies

## I. INTRODUCTION

With the development of nonlinear analysis procedures, the more complex seismic analysis became possible with an increase level of accuracy and reliability. The first generation (ATC 40 and FEMA 273), second generation (FEMA 356), and next-generation (ASCE 41 and FEMA 440) have put forth the nonlinear static analysis procedures for the evaluation of performance of reinforced concrete (RC) structures. Finite element based software's namely SAP, ETABS, IDARC, DRAIN, etc., has adopted these procedures for the evaluation of nonlinear responses [1-7]. PBSE procedures include performance evaluation methods, named "Capacity Spectrum Method (CSM)" and "Displacement Coefficient Method (DCM)". In CSM and DCM procedures capacity of a structure is evaluated by applying the monotonically increasing predefined load pattern until the target displacement is reached. To obtain the nonlinear performance of the structure the capacity spectrum of the structure is compared with the demand spectrum during a seismic hazard [8]. Fig 1(a) & (b) describes CSM and DCM procedures. Due to its simple

process, the nonlinear structural analysis (Pushover Analysis, POA) has become common in practice.

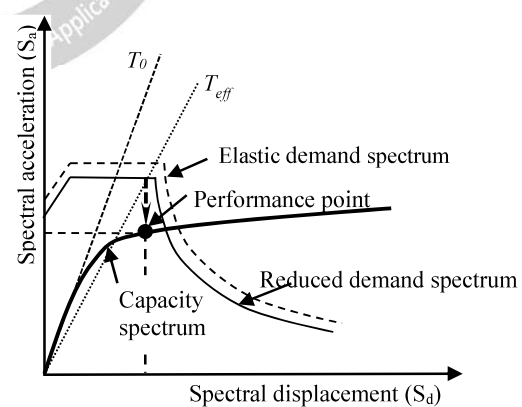


Fig 1(a): Determination of performance point by CSM [7]

Modeling of the reinforced concrete (RC) members for POA requires the determination of the nonlinear properties of each component in the structure, quantified by strength and deformation capacities which depend on the modeling assumptions [7].

# Performance-based Seismic Evaluation of Vertically Irregular Moment Resisting Reinforced Concrete Frames using Nonlinear Statics Analysis

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## Abstract

Nonlinear static procedures are used mainly for evaluation of the capacity of structures subjected to the seismic loads. During the seismic events reinforced concrete structures get damaged or collapsed. These damages happen due to the improper distribution of structural mass, structural stiffness and structural strength. In the structural irregular frames damages appears along the section which are geometrically unstable. This vulnerability of the irregular frame has caused discomfort among the stakeholders, especially for the multi-storeyed structures. In this study, we had performed nonlinear static analysis of the irregular frames, typically representing the vertical irregularities. The engineering demand parameters such as base shear, displacement, ductility, stiffness and inter-storey displacement were used to evaluate the performance of these frames. In addition an attempt has been made to correlate the damage state of frames with the identified performance level described in the performance-based seismic design documents.

**Keywords -** Structural Irregularities, Nonlinear Static Procedures, Example MRFs, Engineering Demand Parameters

## INTRODUCTION

The seismic events which happened all over the world had destructive effects on the structures, which has forced the professional structural designers to implement the earthquake resistant design of the structures for safety of life and usage of structures [Ghobarah A, 2001; Zameeruddin and Sangle, 2016]. The scarcity of the availability of residential land and increase in the cost of the construction, especially in the urban areas has led towards the development of the multi-storeyed structures. The behaviour of multi-storeyed structure under the seismic loads depends on structural configurations. Irregular structural configurations either in plan or elevation are the major causes of failures during seismic events [Siva et al., 2019].

The earthquake resistant design methodologies

described in the present seismic codes are not capable to address the inelastic behaviour of reinforced concrete sections subjected to inelastic incursion. These codes provide the indirect approach of applying modification factor to the strength and displacements to take care of inelastic incursion [Mondal et al., 2013]. The predictive method of design available in the Performance-based Seismic Design (PBSD) documents proved to be the best alternative towards this code based procedures [FEMA 445, 2005; Zameeruddin and Sangle, 2021].

Performance evaluation procedure defined in PBSD documents are based on the nonlinear static or nonlinear dynamic analysis procedures. Due to ease in its procedure, the nonlinear static methods have become more common among the practicing engineers. The performance evaluation procedures based on the nonlinear static method include; (a) Capacity Spectrum Method (CSM) and Displacement Coefficient Method (DCM). [ATC 40, 1996; FEMA 273, 1996; FEMA 356, 2000; ASCE/SEI 41, 2007; Zameeruddin and Sangle, 2021; Boroujeni ARK 2013].

In PBSD the performance of the structure is evaluated on the basis of the damages sustained by structural and non-structural component. These performance levels are identified as operational levels, immediate occupancy, life safety range and collapse prevention. The performance analysis results into the collapse mechanisms which show the yielding of structural components, but are not capable to provide any damage value.

In this study, an attempt has been made to assess the performance of example moment resisting frames (MRFs) with different irregular configurations subjected to the lateral load patterns as described in the IS 1893 [2002]. The performance assessment includes parametric studies on fundamental period, roof displacement, inter-story drift ratio, and base shear. In addition, we had attempted to find the global damage



# Evaluation of Efficacy of the Elevated Water Tank Under the Seismic Loads

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**Abstract** - Elevated water storage tanks are the lifeline structures in urban areas that should remain serviceable during and after a seismic event. Experience learned from the past earthquakes worldwide showed that elevated water tanks were heavily damaged or collapsed during a seismic event. This failure attributes to the deficiency and misjudgment in the analysis and design aspects. Design procedures available in the present seismic codes indirectly address the inelastic behavior, and they showed the overestimates of the actual strength. Proper selection of a staging system and engineering demand parameters are the key elements of the elevated water reservoir design. In the present work, we performed a non-linear time history analysis on the models prepared about the data of existing elevated water tanks available within the Nanded region (Maharashtra-India). The obtained engineering demand parameters were used to predict the efficacy of elevated water tanks.

**Keywords** — Earthquake, Elevated water tanks, Non-linear Time history analysis, Seismic analysis, Seismic demand.

## I. INTRODUCTION

One of the basic needs for the survival of a human being is water. Water is made available in urban areas through an effective and efficient water distribution system. Elevated water tanks are one of the key elements of this water distribution system. The innovation in the design and analysis procedures for water tanks made it possible to have water tanks of various structural forms. In India, the water tank design is done under the guidelines of IS 3370: 2009 [1-4].

Liquid storage tanks are used extensively by municipalities and industries for storing water, inflammable liquids, and other fluids. Thus, Water tanks are very significant for public utility and industrial structure. Water tanks are very significant components of a lifeline. They are the basic component in municipal water supply, firefighting systems, and many industrial facilities to store water. The fluid storage tanks are especially subjected to the risk of damage due to earthquake-induced vibrations. An enormous number of overhead water tanks harmed during a past earthquake. Most of them were shaft staging, while a couple of them were on frame staging type Elevated storage tanks

containing an outsized amount of water mass at the highest of a slender staging, which is the most crucial consideration for the failure of the tank during earthquakes.

Overhead storage tanks are basic and vital structures, and failure of these structures during earthquakes may destroy drinking water supply, cause to fail in preventing huge fires, and considerable economic loss. Since the overhead tanks are often utilized in active seismic regions, their seismic behavior must be explored in detail; due to the absence of information on the supporting framework, a portion of the water tank was collapsed or heavily damaged.

## II. LITERATURE REVIEW

Manish N. Gandhi, Prof.A. Rajan (2014) They studied the “Necessity of Dynamic Analysis of Elevated Water Storage Structure Using Different Bracing in Staging” to understand the behavior of different staging, under different loading conditions and strengthening the traditional sort of staging, to offer the higher performance during the earthquake. This study aimed to understand the necessity of analyzing the conventional staging system of an elevated water storage tank with various bracing types in a staging system for the elevated water storage tank.

Krishna Rao M.V (2015) that they had presented a study about the “Seismic Analysis of overhead Circular water Tanks-A Comparative Study” during this paper, he had compares the results of seismic analysis of overhead circular water tank administered by following under IS: 1893- 1984 and IS: 1893-2002 (Part-2) draft code. The analysis was finished with an elevated circular tank of 1000 Cu m capacity, located in four seismic zones (Zone-II, Zone -III, Zone-IV, Zone-V) and three different soil types (Hard rock, Medium soil, Soft soil). Concluded that increase in base shear, base moment, hydrodynamic pressure, and period time with increasing zone factor for all soil types.

Atul Jadhav et al. (2015) that had studied and provided the theoretical background of an “A review paper on analysis of elevated water storage tank in a high seismic zone by using staad-pro software” he had presented the study of seismic performance of the elevated water storage tanks for high-intensity seismic zones of India for various section of elevated water storage tanks for various circular shape (dome concrete floor, flat concrete floor). The effect of a water



# Estimation of the Efficacy of Tuned Liquid Column Damper using Frequency Response Curves

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**Abstract** - The Tuned Liquid Column Damper (TLCD) efficacy in the dynamic response control of structure has been investigated. The TLCD is a passive device that consists of a U-shaped tube filled with liquid columns that exhibit non-linear damping resulting from the hydrodynamic head loss observed inside the liquid column. In the present study, the response of a single degree of freedom (SDOF) system equipped with TLCD under the harmonic base excitation has been investigated. The parametric study includes estimates of maximum Displacement and maximum Acceleration using the non-linear coupled governing differential equation of motion. Mass ratio and length ratio in the frequency domain and varying base acceleration intensity was studied. This study aims to obtain the optimal combination of TLCD parameters' values, aiming to achieve the most optimized peak maximum response of the structure in the frequency domain. The results showed that the set of optimum parameters' values could be effectively applied in the design of TLCD in attenuating the dynamic response of structures.

**Keywords** - Tuned Liquid Column Damper, Frequency Response Curves, Non-linear Damping, Mass Ratio, Base Acceleration.

## I. INTRODUCTION

In the present era, modern cities are growing fast, the shortage in land space and increasing population resulted in the construction of tall structures. The modernization in structural engineering and advanced construction technologies has led to lighter and flexible, tall structures and buildings vulnerable to dynamic loads like winds and earthquakes. The dynamic transverse loads on taller structures cause structural vibrations, which can become unacceptable from the serviceability, safety, and comfort point of view of the buildings' occupants. Structural design engineers and researchers worldwide face this challenge to attenuate the structural vibrations from the dynamic environmental loads like winds and earthquakes, and they are continuously working on finding the different kinds of

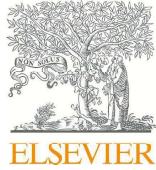
structural systems that are robust and simple at the same time.

The dampers' installation was the conventional way of regulating the vibration of the structures, but it was effective. These can be used to mitigate the damaging impact of the structures induced by dynamic loads, which is accomplished by dissipating the structural vibration energy with the dampers mounted. The vibration control systems are broadly classified as Passive, Active, and Hybrid systems. This paper's study and research are focused in particular on a specific type of passive vibration control device called the Tuned liquid column damper (TLCD).

The Tuned liquid column damper consists of two vertical columns filled with a liquid whose vibration frequency is tuned to the structural natural vibration frequency, connected by a horizontal crossover duct of the same width and area forming a U-shaped type tube container, See Figure.1(a). The structure's vibration energy is dissipated through the damping effect produced by the headloss caused by the continuous flow motion of liquid through the two vertical columns and a horizontal crossover duct. The liquid kept typically is water, which can be advantageous in water supply and fire-fighting purposes. The tuned liquid column damper draws various advantages over other passive vibration control systems like Tuned mass dampers (TMD), Friction Dampers, Viscous Dampers, handling and installation, and easy liquid frequency tuning with structure, very few maintenance requirements, and lower cost.

Several past studies have contributed in the field of vibration control of structures using TLCD and other passive devices. TLCD was first proposed by Sakai et al. [1], which reduces wind-induced horizontal loads of tall structures. Xu et al. [2] investigated the efficiency of TLCD for controlling wind-induced vibration of a structure. The wind-induced vibration of towers was effectively controlled by TLCDs. Balendra et al. [3] studied the effectiveness of TLCD in controlling the wind-induced vibration of towers and in the suppression of wind-induced Acceleration of towers with different fundamental frequencies. Hitchcock et al. [4][5] first investigated the effects of the geometric configuration of liquid column vibration absorber (LCVA) without orifices and later, by performing experiments, observed the characteristics of rectangular-based bidirectional LCVAs (without orifices). The wind-induced vibration of a building





# Damage assessment of reinforced concrete moment resisting frames using performance-based seismic evaluation procedure

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## ABSTRACT

The performance-based seismic design has two primary concerns: (a) appropriate quantification of the uncertainties associated with the performance evaluation process, and (b) satisfactory characterization of the associated structural damage for direct incorporation into the design or performance evaluation methodology. This study deals with seismic damage assessment of moment resisting frames. Some damage indicators are introduced by using the nonlinear responses obtained at the output of nonlinear static procedures. Among these, some are possible extensions of previously defined static indicators and some are newly defined ones. The damage variables used in formulation are inelastic displacement, spectral displacement, spectral acceleration, and base shear. The introduced damage indicators address the plastic ductility, loss of strength, stiffness degradation, and dissipated energy of a structure. The variations in damage values for various drift criteria were used to associate with different performance levels.

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## 1. Introduction

Damage in a reinforced concrete (RC) member relates to cracking, which leads to the crushing of concrete. This phenomenon begins with the spalling of concrete cover, followed by the crushing of the confined core, which are not easy to define under predominant flexural conditions. The various damage criteria used for defining the state of failure of an RC member are presented in Fig. 1 (Kappos, 1997).

Predicting the amount of seismic damage that an RC structure is likely to sustain during its design life is a probabilistic problem. Some deterministic approaches have been proposed by many researchers (Powell and Allahabadi, 1988; Williams and Sexsmith, 1995; Ghobarah et al., 1999; Wang et al., 2007; Jaing et al., 2011; Habibi et al., 2013; Mihai, 2015; Zameeruddin and Sangle, 2017). In the relevant literature, two basic procedures have been used to calculate the structural damage value. The first procedure is based on the balance between some demand on the structure and its corresponding capacity. The second procedure is based on the degradation of some structural parameter. By using each procedure, one or more damage parameters are obtained, from which the DIs are calculated (Zameeruddin and Sangle, 2017).

The DI uses various demand parameters to form a non-dimensional index, which normalizes the structural damage on a scale of 0 to

1, where 1 represents the collapse state of the structure and 0 represents the undamaged state of the structure. Other values between 0 and 1 represent the intermediate damage state of the structure.

DIs are broadly classified into two categories, local DI and global DI. The local DI quantifies damages in an individual member (e.g., at individual joints or an intended cross section). The global DI quantifies the damage related to the response of the whole structure, and is represented by the weighted averages of the local damage at different structural levels. DIs are further subdivided into noncumulative, cumulative, and combined DIs. All the available DIs and their limitations have been discussed in detail in previous studies (Zameeruddin and Sangle, 2017; Ghobarah et al., 1999).

In an RC structure, damage relates to inelastic deformations. Therefore, any damage variable representing a demand parameter includes a certain deformation quantity. The story and interstory displacements are measures of the global damage state, whereas the strain in a material, curvature at the cross section, and rotation of the member ends are used to define the local damage state. A straightforward method of damage identification may be the use of forces as a damage variable (i.e., base shears, story shears, and member resistances). The energy absorbed or dissipated during inelastic reversed cyclic loadings of RC members is also a suitable damage variable. In addition, damage variables can be defined in monetary terms in situations involving seismic risk (Kappos, 1997; Powell and Allahabadi, 1988).

The currently available damage models use nonlinear time-history analyses (NRHA). However, the time-consuming iterative process involved in the calibration of these models has limited their application in damage assessment. Very few researchers have attempted to de-

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# Performance-based Seismic Assessment of Reinforced Concrete Moment Resisting Frame

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## ABSTRACT

The performance-based seismic design has two primary concerns: (a) appropriate quantification of the uncertainties associated with the performance evaluation process, and (b) satisfactory characterization of the associated structural damage for direct incorporation into the design or performance evaluation methodology. This study attempts to address these primary concerns by evaluating the performance of reinforced concrete frame using nonlinear static procedures. For this, fifteen-moment resisting frames designed following the guidelines of Indian seismic codes were subjected to different lateral load patterns. The seismic performance is investigated in terms of fundamental periods, roof displacements, interstory drift ratio, base shear, and modification factor and was compared with various performance limits. The obtained results showed disagreement with Indian seismic code provisions, especially, towards the fundamental time period, upper and lower bound values of base shear drift ratio and modification factor.

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## 1. Introduction

The current perspective seismic design philosophy for reinforced concrete (RC) buildings, as outlined in various codes and guidelines, might help to construct buildings with acceptable safety. However, these procedures are indirect, of unknown reliability, and may lead to inefficient and costly construction. Strong earthquakes induce nonlinear behaviors in RC structures, and these perspective design philosophies do not explicitly incorporate the inelastic response of structures. Therefore, the structural engineering community has focused on the newly developing predictive design approach known as performance-based seismic design (PBSD). PBSD facilitates the design and construction of buildings with realistic and reliable understanding of the risk of loss (physi-

cal, direct economic, and indirect economic) that might occur as a result of future seismic events (Al-Haddad and Siddiqui, 1995; Ghobarah, 2001).

Several studies have been credited towards the development of PBSD methodologies, resulting in guideline documents such as the ATC 40 (1996), FEMA 273 (1996), FEMA 356 (2000), FEMA 440 (2005), ASCE 41 (2006) and FEMA 445 (2006). All PBSD methodologies share the following common elements: (i) definition of performance objectives that describe the level of performance associated with a specific seismic hazard, (ii) estimation of seismic demands on the system and its components through detailed structural analysis (preferably nonlinear), and (iii) assessment of the performance (at the system and component levels) to verify that the performance objectives have been met (Zameeruddin and Sangle, 2016; Ghobarah 2001). These PBSD guideline documents have presented various performance-based seismic evaluation (PBSE) procedures, including the capacity spectrum method (CSM) and displacement coefficient method (DCM), by using nonlinear static pushover analysis (NLSA). The acceptance criterion for nonlinear behavior is defined in terms of an interstory drift ratio and a plastic rotation, which reflects the deformation capabilities of the structure. Based on these deformation capabilities, various building performance levels such as immediate occupancy (IO), life safety (LS), and collapse prevention (CP) were established. Although these measures provide information on the deformation of members

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# INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

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## Study of Punching Shear in Flat Slab System Subjected to Seismic Load

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**Abstract:** Flat-slab structural systems have large applicability due to their functional and economic advantages. Flat plate slabs exhibit higher stress at the column connection and are most likely to fail due to punching shear rather than flexural failure. To avoid shear failure, realistic analytical or experimental studies must investigate parameters influencing the punching strength. Flat plates were subsequently developed, with no drops and no column capitals and due to the cheaper formwork required, they were popular for residential and office buildings. The computer program ETABS is used to model columns and slabs as frames respectively. The present analytical study investigates the influence of some of the parameters governing the behaviour of connections under punching shear: concrete strength, column aspect ratio, slab thickness, and gravity loading. Parametric studies on depth-to-span ratio & column aspect ratio have been carried out using equivalent static analysis to investigate the influence of these parameters on punching shear capacity of the column connections, which proved to be the governing criteria to prescribe drift limits for flat plate systems in seismic zones.

**Index Terms** - Depth-to-span ratio, flat slab, punching shear, ETABS

### I. INTRODUCTION

The simplest definition of flat slab systems can be stated as "buildings in which slabs are supported directly on columns". As per IS 456-2000, "the term flat slab means a reinforced concrete slab with or without drops, supported generally without beams, by columns with or without flared column heads". Flat plates refer to flat slabs without drop panels and column heads. Flat-slab (or plate) reinforced concrete systems have become a common sight in most the developing countries, including India. A good number of commercial and office buildings around many Indian metro cities have been observed to adopt a flat-slab system because they are relatively inexpensive to construct and because of the reduced story heights and open floor plans that are possible with such framing. A typical six story residential type open ground reinforced concrete flat slab is considered. The equivalent static analysis was performed for which flat slab model for concrete is taken. This process is repeated for various depth to span ratio, influence of drop on punching shear stresses are being studied. This study particularly emphasized on predicted mode of failure and punching shear capacity. The modes of failure were based on structural response. i.e., deflection, crack pattern and stresses in steel and concrete which agree with analytical observations. Parametric study using equivalent static analysis is performed to carry out the strength and distribution of forces.

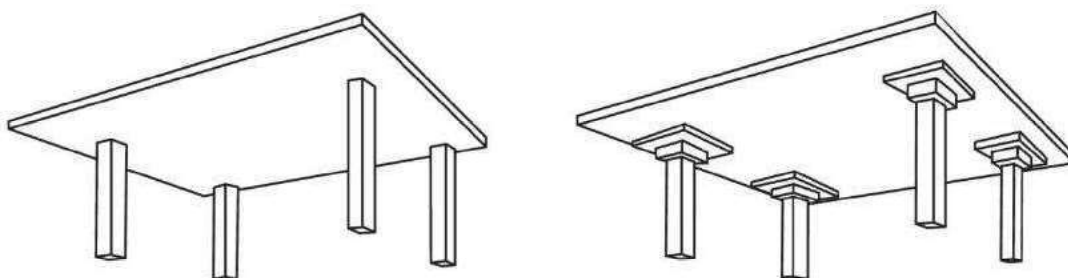


Fig.1 Flat plate with drop and without drop



# Behavior of RCC structure with different configuration of infill wall with different configuration of RCC FRAME

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*Abstract:* Framed reinforced concrete structures are most commonly types of structures constructed all over the world due to ease of construction and rapid progress of work. Generally, brick or block work masonry is done in these frames which act as an infill panels in the framed structure. Infill walls provide the lateral stiffness to the structure. Its behaviour is very different from the bare frame structure. In this research we are trying to find the structural behaviour of Rcc structure when subjected to lateral loads and applying the bracing with changing the position of infill we observe that the position makes a huge difference in structural behaviour. nowadays typical structures with irregularities in it becomes a trend to change the infill with glass panel. our is to find the location of infill which is good for structure and its stability.

Methods adopt here by taking the different type of structure like T-shaped and inverted T-shaped structure and applied different positions of infill to check the effects on structure.

The results of this is compared with the bare frame and we observed that the bare frame shows maximum deflection, reduction in stiffness, story drift maximum.

Infill in the structure shows comparative stability in the structure.

As per our results we can suggest the stable positions of infill our aim is to provide the best possible positions of infill in irregular structure.

Keywords: multistore structure, role of infill, masonry infill, modelling parameters, story response evaluation.

## I. INTRODUCTION

Behavior of masonry infilled concrete frames under the lateral load is studied. Investigations showed that, one of the most appropriate ways of analysing the masonry infilled concrete frames is to use the diagonally braced frame analogy. RCC buildings are generally analysed and designed as bare frame. But after the provision of infill walls, mass of the building increases and this will result in the increase of the stiffness of the structure. During the seismic activities, response of the structure with infill walls is quite different for the structure without infill walls. Infill walls changes the dynamic behaviour of the structure. In this study two G+8 storied structure models are generated. In one structure, brick infill walls are modelled as strut element. These struts act as a compression member. In the other structure, only bare frame structure is modelled and also different patterns of infill is modelled to study the infill effect. All the parameters i.e. beam sizes, column sizes, floor height; load parameters etc are same for both the structures.

## Parametric Study on Time Period of a RC Structure

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### ABSTRACT

In order to understand the performance of the building under seismic effect and the effect of lateral loads on a structure, it is necessary to evaluate the time period of a structure. It is necessary to determine the significance of the time period before evaluating the time period of a structure. Time period plays an important role in estimating the lateral loads and hence contributes to the seismic assessment of a structure. Time period depends on mass and stiffness. Based on the time period which is purely dependent on stiffness and mass, the behavior of building under lateral loads can be evaluated. In this study an attempt is done to understand the various parameters which affect the time period of a RC building. The parametric study is done on time period of a structure as per the provisions of IS 1893(part I):2002. In this present work, a reinforced concrete special moment resisting frame building models are prepared and analyzed in ETAB software to illustrate the influence of various parameters of building such as building stiffness, mass, height of building and column orientation and unreinforced masonry infill on fundamental translational natural period.

**Keywords** – Equivalent static method, Time period, Infill panel, Etab, Stiffness of building

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### I. INTRODUCTION

Buildings oscillate during earthquake shaking. The oscillation causes inertia force to be induced in the building. The intensity and duration of oscillation, and the amount of inertia force induced in a building depend on features of buildings, called their dynamic characteristics, in addition to the characteristics of the earthquake shaking itself. The important dynamic characteristics of buildings are modes of oscillation and damping. A mode of oscillation of a building is defined by associated Natural Period and Deformed Shape in which it oscillates.

#### 1.1 Natural Period

Natural Period ( $T_n$ ) of a building is the time taken by it to undergo one complete cycle of oscillation. It is an inherent property of a building controlled by its mass  $m$  and stiffness  $k$ . These three quantities are related by

$$T_n = \sqrt{\frac{m}{k}} \text{ ----- eq (i)}$$

its units are seconds (s). Thus, buildings that are heavy (with larger mass  $m$ ) and flexible (with smaller stiffness  $k$ ) have larger natural period than light and stiff buildings. Buildings oscillate by translating along X, Y or Z directions, or by rotating about X, Y or Z axes, or by a combination of the

above. When a building oscillates, there is an associated shape of oscillation.

#### 1.2 Fundamental Natural Period of Building

Every building has a number of natural frequencies, at which it offers minimum resistance to shaking induced by external effects (like earthquakes and wind) and internal effects (like motors fixed on it). Each of these natural frequencies and the associated deformation shape of a building constitute a Natural Mode of Oscillation. The mode of oscillation with the smallest natural frequency (and largest natural period) is called the Fundamental Mode; the associated natural period  $T_1$  is called the Fundamental Natural Period (Figure 2.5) and the associated natural frequency  $f_1$  the Fundamental Natural Frequency. Further, regular buildings held at their base from translation in the three directions, have

(1) three fundamental translational natural periods,  $T_{x1}$ ,  $T_{y1}$  and  $T_{z1}$ , associated with its horizontal translational oscillation along X and Y directions, and vertical translational oscillation along Z direction, respectively, and (2) one fundamental rotational natural period  $T_{\theta 1}$  associated with its rotation about an axis parallel to Z axis.

Seismic analysis of most of the structures are still carried out on the basis of lateral force assumed to be equivalent to the actual loading the base shear which is the total horizontal force on the structure is calculated on the basis of structure mass

# Enhancing lifetime of wireless multimedia sensor networks using modified lion algorithm-based image transmission model

Enhancing  
lifetime of  
wireless sensor  
networks

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## Abstract

**Purpose** – In the past few decades, the wireless sensor network (WSN) has become the more vital one with the involvement of the conventional WSNs and wireless multimedia sensor networks (WMSNs). The network that is composed of low-power, small-size, low-cost sensors is said to be WSN. Here, the communication information is handled using the multiple hop and offers only a simple sensing data, such as humidity, temperature and so on, whereas WMSNs are referred as the distributed sensing networks that are composed of video cameras, which contain the sensor sense area. These WMSNs can send, receive and process the video information data, which is more intensive and complicated by wrapping with wireless transceiver. The WSNs and the WMSNs are varied in terms of their characteristic of turnability and directivity.

**Design/methodology/approach** – The main intention of this paper is to maximize the lifetime of network with reduced energy consumption by using an advanced optimization algorithm. The optimal transmission radius is achieved by optimizing the system parameter to transmit the sensor information to the consequent sensor nodes, which are contained within the range. For this optimal selection, this paper proposes a new modified lion algorithm (LA), the so-called cub pool-linked lion algorithm (CLA). The next contribution is on the optimal selection of cluster head (CH) by the proposed algorithm. Finally, the performance of proposed model is validated and compared over the other traditional methods in terms of network energy, convergence rate and alive nodes.

**Findings** – The proposed model's cost function relies in the range of 74–78. From the result, it is clear that at sixth iteration, the proposed model's performance attains less cost function, that is, 11.14, 9.78, 7.26, 4.49 and 4.13 % better than Genetic Algorithm (GA), Dragonfly Algorithm (DA), Particle Swarm Optimization (PSO), Glowworm Swarm Optimization (GSO) and Firefly (FF), correspondingly. The performance of the proposed model at eighth iteration is 14.15, 7.96, 4.36, 7.73, 7.38 and 3.39 % superior to GA, DA, PSO, GSO, FF and LA, correspondingly with less convergence rate.

**Originality/value** – This paper presents a new optimization technique for increasing the network lifetime with reduced energy consumption. This is the first work that utilizes CLA for optimization problems.

**Key words** WMSN, Energy consumption, Camera-equipped sensor node, Optimization, Network lifetime

**Paper type** Research paper

## Nomenclature

Abbreviation	Description
WSN	Wireless Sensor Networks
WMSN	Wireless Multimedia Sensor Network
SBC	Single-Board Computers



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## Hybrid model-based image transmission for maximizing network lifetime in wireless multimedia sensor networks

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This paper intends to increase the network lifetime of Wireless Multimedia Sensor Network (WMSN) by reducing the energy consumption for multimedia data transmission. To accomplish this, the optimal transmission radius of the transmitting sensor nodes and appropriate selection of optimal Cluster Head (CH) at every round are integrated with the energy consumption model to act as the cost model. Subsequently, we develop a new hybrid optimization model, termed as NC-GSO, that hybridizes the Glowworm Swarm Optimization (GSO) and Dragonfly (DA) Optimization. The proposed algorithm is used to minimize the cost function so that the optimal transmission radius and the CHs are determined. The performance of the proposed methodology is investigated in a simulated WMSN environment in which the enhanced network lifetime and the residual energy of the sensors are compared against the state-of-the-art algorithms. To ensure a fair comparison, statistical analysis is also conducted. The obtained results demonstrate the performance of the proposed algorithm in enhancing the lifetime of WMSN.

**Keywords:** WMSN; cluster head; energy consumption; GSO; DA; transmission radius.

**AMS Subject Classification 2020:** 68M18

### 1. Introduction

Nowadays, the easy availability of low-cost, small-scale sensors constantly encourages the progression of multimedia sensor network that highly improves the

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## Data stream classification: a review

Kapil K. Wankhade<sup>1</sup> · Snehlata S. Dongre<sup>2</sup> · Kalpana C. Jondhale<sup>3</sup>Received: 9 January 2019 / Accepted: 7 May 2020 / Published online: 27 May 2020  
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### Abstract

The tremendous amount of data is generated regularly through areas like networking, telecommunication, stock market, satellite, weather forecasting, etc. So, the classification process becomes important to extract knowledge from such a huge amount of data. The handling of concept drifting data stream and skewed data classification are the major issues and challenges in the data streams mining field. In the presence of concept drift, the performance of the learning algorithm always degrades. On the other side in skewed data problems, majority class accuracy always dominates minority class accuracy which generates the wrong result. This paper discusses the implemented methods which worked for skewed data and concept drifting data as well as their merits and demerits. This paper focused on metrics used in the classification process and issues that arise while learning with skewed and concept drifting data.

**Keywords** Concept drift · Skewed data · Classification · Clustering · Sampling · Semi-supervised learning

### 1 Introduction

Data stream classification is a huge growing field and has been gaining great attention from the research community from the last decade. Handling of concept drift and rare class data is the major issue in the data stream classification.

#### 1.1 Background and motivation

The huge amount of data has been generated rapidly and very fast in today's growing world. Such a huge amount of data handling as well as analyzing is the most challenging task. In the research field, data stream mining has great

attention because of the tremendous amount of data that have been generated from applications or industries such as networking, finance, the stock market, education, telecommunication, healthcare, weather forecasting and many more. The research industry has given great attention in solving data streams mining issues like scanning of data in a single pass, classification of such huge amount of data, suitable algorithm selection, concept drift, skewed data, performance in terms of time, accuracy and memory and learning approach. In the field of concept drift, it is very difficult for the classifier to detect time-changing classes or to classify time-changing data. Because, the occurrence of the concept drift is unpredictable or not fitted which leads to the inability to train the classifier with such data and results in performance degradation. On the other hand, in the field of skew data or rare class or imbalanced class distribution, it is very difficult for the classifier to learn small class events because of class overlapping which leads to misclassification of minority class samples. Hence, it significantly affects the classification accuracy of the classifier. For example, if there are two classes Class A and Class B in which Class A is the majority class and Class B is a minority class, a learning algorithm generates accuracy based on Class A samples without considering Class B samples and always tries to improve classification accuracy only considering Class A samples. Because of such a condition, it becomes a challenging task for the learning algorithm to optimize classification

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# Content-based retrieval system for surgery videos

M.R. Banwaskar and A.M. Rajurkar

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ABOUT

## Abstract

There has been tremendous growth of laparoscopic surgical video archives in the past few years. Finding the surgical videos manually from the database is very troublesome and time consuming. As a consequence, efficient methods for retrieval of such videos from a database are needed. In this paper, a content-based video retrieval (CBVR) system is presented using average intensity, colour and shape feature. In the proposed retrieval system, average intensity, colour and shape feature are used. The ordinal measure introduced by Bhat and Nayar, which is based on ranks rather than of their values is used in this work. This is important in the laparoscopic videos because adjacent frames can be distinguished on the basis of ranking of their average intensities. Experimental results reveal that mean average precision of the proposed technique is better than the existing motion intensity and direction descriptor (MIDD) approach. This reflects the effectiveness of proposed method.

## Keywords

content-based video retrieval, laparoscopic surgery video, ordinal measure, motion intensity and direction descriptor, MIDD, Bhattacharya distance, feature vector

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# Fragility Analysis of Infilled Reinforced Concrete Frames Subjected to Near-Field Ground Motions

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KSCE Journal of Civil Engineering

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## Abstract

The present paper deals with the analytical investigation of representative planar masonry-infilled reinforced concrete (MIRC) frames for seismic fragility, performance and demand. The study includes the effect of various patterns of layout for infills panels along the height of reinforced concrete frames. The analytical investigation has been done using non-linear dynamic time-history analysis under collection of forty SAC near-field ground motions using rational hysteretic models for structural components; the results are presented in terms of parameters such as peak inter-storey drift, residual drift and damage index. The outcomes of study are used to develop seismic fragility curves in probabilistic terms for the generic medium-rise MIRC frames. The developed fragility curves can be useful tools in

## Analysis of Tree structure for Secure Group Communication Using LKH Approach

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**Abstract**— Logical Key Hierarchy is a scalable and efficient method to achieve logarithmic rekeying cost in secure group communication. In applications like pay per view, video conferencing with multiple rekeying operations, the key tree will be unbalanced and will generate worst case rekeying cost. With each join, leave operation we change group key, as well as update all keys along the key path of join/leave user. Key aspect in secure group communication is maintained balanced key tree and achieving logarithmic rekeying cost. In this paper improvement in Non-split balancing high order tree is proposed. I-NSBHO (improved Non Split Balancing High order tree) with proposed Join user algorithm and leave user algorithm maintains balance of tree and always achieve logarithmic rekeying cost. Our experimental result shows the achieved improvement in rekeying cost of I-NSBHO join and leave operations compared to original NSBHO join and leave operations. With Node pruning I-NSBHO improves join cost and maintains logarithmic Rekeying cost for leave operation

**Keywords**— *Secure Group Communication, NSBHO Tree, Logical Key Hierarchy, Message cost, Rekeying, Key tree, key path, Logarithmic Rekeying Cost*

### I. INTRODUCTION

In IP multicast, secure group communication is not provided by the network, thus for secure group communication a group key known to all group members is used. With change in group dynamics due to join group or leave group, it is necessary to change the group key and distribute this change in group key to all current group members. This entire process of change and updating of new group key is called as rekeying. This achieves backward and forward secrecy. Backward secrecy is maintained if a user joins the group now, the previous group communication is not accessible to that user. Forward secrecy is achieved, if a user leaves group now, will not be able to get further group communication. In recent years many scalable rekeying approaches are proposed, but among all, LKH and its variants are widely used [1], [3], [9]. In hierarchical tree approach [9], [11] a key tree of current group-users is maintained. In this rooted tree, where leaf node denotes a user and all users are at the same level is built in bottom up manner. Server has key tree structure of current group-users. The server is responsible for authentication of user participating in group communication. Server has authentication information of each user along with

its individual key. Server generates and distributes group key to all current group users in group communication.

Figure 1 describes centralized key management and distribution in hierarchical key tree approach. Server handles three types of keys, group-users individual key/user key (UK), subgroup keys (SGK), and group key (GK). Figure 1 show, key operations required in secure group communication at server side and user side [12]. PRNG (pseudorandom number generator) generates user's individual key. Figure 1 describes rekeying module, role of encryption and decryption in applications like pay per view [2]. For each user, hierarchical key tree approach has logarithmic storage cost [5]. In hierarchical key tree approach logarithmic rekeying transmissions are required [6]. Figure 1 explains role of server in hierarchical key tree approach. It also describes unicast and multicast messages required for secure group communication at server and user side.

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# Design of Epoxy based Resin Composites for Automotive Applications: A Case Study on IC Engine Valve Guide

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## Journal of The Institution of Engineers (India): Series C

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## Abstract

The present attempt in this project is to reduce the vibrations, temperature due to friction, noise and weight of I C engine valve guide by replacing conventional metal valve guide with composite valve guide. Composite materials have been used in automotive components because of their properties such as low weight, high specific stiffness, corrosion resistance, ability to produce complex shapes, high specific strength and good impact energy absorption etc. The Internal combustion engine valve guides are the parts that support the valves in the cylinder head, besides this it keeps lubricating oil from getting sucked into the

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## An ensemble clustering method for intrusion detection

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**Abstract:** The amount of data in the field of computer networking is growing rapidly and this urges new challenges in the field of an intrusion detection system (IDS). To handle such increasing volume of data, a new hybrid approach has to be developed to overcome the problems such as high detection rate and low false alarm rate. An intrusion detection system plays a vital role in the detection of malicious attacks. Data mining and machine learning techniques are important and play a vital role in the detection of attacks. This paper mainly focuses on detection rate and false alarm rate and so to resolve these problems a hybrid method, ensemble clustering, has been proposed. This method tries to increase detection rate with lowering false alarm rate. The method has been tested on KDDCup'99 network intrusion dataset and performs well as compared with other algorithms in terms of detection rate and false alarm rate.

**Keywords:** boosting; classification; clustering; data mining; divide and merge; detection rate; false alarm rate; intrusion detection system; IDS; ensemble method; k-means.

**Reference** to this paper should be made as follows: Wankhade, K.K. and Jondhale, K.C. (2019) 'An ensemble clustering method for intrusion detection', *Int. J. Intelligent Engineering Informatics*, Vol. 7, Nos. 2/3, pp.112-140.

**Biographical notes:** Kapil K. Wankhade received his BE in Information Technology in 2007 and MTech in Computer Engineering in 2010 from COEP. He is currently pursuing his PhD from the Swami Ramanand Teerth Marathwada University, Nanded, India. He is currently working as an Assistant Professor in the Department of Information Technology at G.H. Raisoni College of Engineering, Nagpur, India. His research interests are data stream

# NANOTECHNOLOGY: A NEW PERSPECTIVE FOR MANAGEMENT OF ENVIRONMENT

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**ABSTRACT:** With growing industrialization and increasing population, extended droughts and excessive rainfall, pollution has become the biggest environmental challenge. Moreover, the technological advancement with improper management has also given rise to new pollutants which are increasing at an alarming rate. Hence there is an urgent need to find technologies that would reduce pollution levels in fast and simple ways. Nanotechnology is being explored to provide new solution for detoxification of environment. It can also prevent the formation of dangerous pollutants. In this paper, we discuss the use of nanotechnology for sustainable management of environment and also throw light on how Precision Farming and Energy Generation can be done using Nanotechnology.

**Key Words:** Carbon Nanotubes, nanosensors ,nanodust, nanobiocides, GPS

## I. Introduction

Pollution of air, water and soil is mainly caused by toxic chemicals from industrial and domestic waste, vehicle emissions, excessive use of pesticides, fertilizers etc. It results not only in the destruction of biodiversity, but also severely affects human health. Nanotechnology offers many advantages for pollution control compared with traditional methods. In this sense, nanotechnology can be used for purification, detection of contaminants, and the pollution prevention. Nanotechnology can also used to prevent the formation of pollutants or contaminants by applying the material technology and industrial processes. Thus, the major applications of nanotechnology for protecting environment can be classified as (i) Restoration and purification of contaminated water, (ii) Air pollution detection and control. As shown in fig. (1), Nanotechnology can be used for water and air purification, precision farming, ecofriendly energy generation and soil quality improvement.

We are suffering from a severe water shortage due to irregular rainfall and lack of water management techniques. Biggest rivers are immensely polluted and even their use for irrigation cannot be done. Conventional method of water decontamination such as chlorination and ozonation consume a high amount of chemical agents and, furthermore, can produce toxic byproducts. Due to exceptional characteristics of nanomaterials, they are widely used in water purification and treatment, precision farming, energy generation, etc. Nanomaterials have higher reactivity, larger surface contact and better disposal capability, hence preferred for environmental applications. There are several examples of nanoparticles and nanomaterials that can be used for remediation of water, e.g. zeolites, carbon nanotubes (CNTs) [1], self-assembled monolayers on mesoporous supports, biopolymers, single-enzyme nanoparticles, nanoparticles of zero valent iron (ZVI), etc.



Fig.1 Nanotechnology for Environmental detoxification

# PEER-TO-PEER NETWORKS APPROACH FOR DISCOVERY OF DECENTRALIZED SERVICE

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**Abstract:** Due to demand for interconnected applications and distributed systems sharing their architecture which will have internal service identification process that automatically looks for open ports generated by the server and fetched by the client systems based on the service provided by the server. In the following paper, efforts have been taken to build a decentralized system for mass file transfer and between multiple peers.

**Index Terms**— About Peer-to-Peer Networks, Discovery of Decentralized Service, Web Service Discovery with Ranking, Owl Web Ontology Language Reference, Web Services Dynamic Discovery.

## I. INTRODUCTION

In this paper, we have delivered an in-depth analysis of different service and resource discovery approaches. In order to deliver a formal structure to our conversation and guide the reader through this document, we first defined a set of assessment criteria that are important to any large-scale, multidomain discovery approach and outlined their connected aspects. By analyzing each approach against these criteria, we brought out the strengths and weaknesses of each approach against the goal of an Internet-scale multi-domain service discovery architecture.

Based on this analysis, a comparison study of these approaches is conducted and a brief description of our findings is presented in the Technology Comparison Section. Since this survey has revealed that no single approach meets all of our defined objectives, we have focused instead on choosing those approaches that could be combined to build the desired service-discovery architecture.

In technology section we focused on 3 approaches: Web Services, INS/Twine and structured P2P systems as possible modulus of such an architecture. They are chosen for their scalability, standardization, performance, efficiency, security aspects, system indivisibility and implementation support. In the time since it was originally conducted, this survey has served as the groundwork in designing a new large-scale discovery mechanism that is multi-domain, multi-technology and aims to unite multiple diverse service-discovery platforms [79]. This platform-independent, extensible approach enables cross-technology and cross-domain service discovery, supports domain-level access control for discovery operations, and has bounded query lookup time.

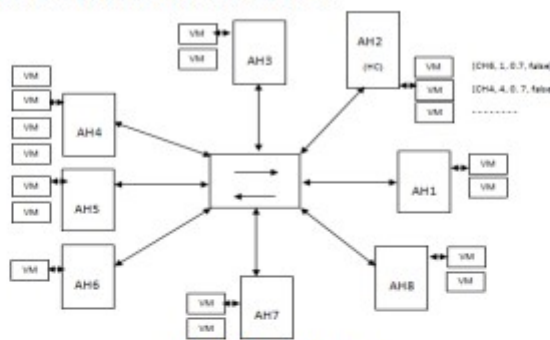


Figure1: Peer to Peer network

## II. CRAWLING MULTIPLE UDDI BUSINESS REGISTRIES

V UBRs for locating services of interest, because the variety of internet services increase, the success of companies can depend upon service discovery and performance time once looking multiple UBRs. Our experiments demonstrate that building a crawler and a centralized repository for internet services is inevitable. For future work, we tend to decide to extend our current framework to incorporate a ranking mechanism that outputs desired services of interest among prime results and thus, rendering the invention method to become additional economical.

# P2P Based Decentralized Service Discovery

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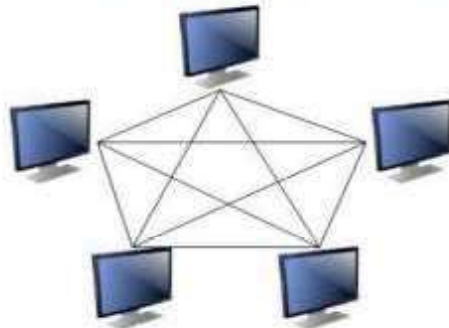
**Abstract:** The ever increasing want for interconnected applications and distributed systems sharing their design which is able to have identification method that mechanically appearance for open ports generated by the server and fetched by the consumer systems supported the service provided by the server. within the following paper, efforts are taken to make a suburbanised system for mass file transfer and between multiple peers.

**Index Terms—**P2P Network, Modulus, System Architectures.

## I. INTRODUCTION

In the common client-server design, multiple purchasers can communicate with a central server. A peer-to-peer (P2P) design consists of a suburbanized network of peers nodes that area unit each purchasers and servers. P2P networks distribute the employment between peers, and everyone peers contribute and consume resources among the network while not the requirement for a centralized server.

However, not all peers area unit essentially equal. Super peers might have a lot of resources and will contribute over they consume. Edge peers don't contribute any resources, they solely consume from the network. In its purest kind, P2P design is totally suburbanized. However, in application, typically there's a central following server superimposed on prime of the P2P network to assist peers notice one another and manage the network.



**Figure 1: Peer to Peer Network**

### Applications:

P2P design works best once there are a unit various active peers in a vigorous network, thus new peers connection the network will simply notice different peers to attach to. If an outsized range of peers drop out of the network, there are a unit still enough remaining peers to choose up the slack.

If there are a unit solely a number of peers, there are a unit less resources obtainable overall. for instance, in a very P2P file-sharing application, the additional fashionable a file is, which suggests that various peer's area unit sharing the file, the quicker it will be downloaded.

P2P works best if the work is split into tiny chunks that may be reassembled later. This method, an outsized range of peers will work at the same time on one task and every peer has less work to try and do. within the case of P2P



# Optimization of Glass fiber and MoS<sub>2</sub> Filled PTFE Composites Using Non Traditional Optimization Techniques

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## Abstract

The present investigation focuses on use of the polymer matrix composite to improve the performance of the bearings used in the industry such as sugar roller bearing, pharmaceutical, milk processing and all the food processing industry. The major problem faced by the industry is the lubrication failure or contamination with process food which is to be avoided. To eliminate this problem this paper focuses on the use of polymer matrix composite for the bearing applications. Polytetrafluoroethylene (PTFE) is polymer based compound with good frictional and wear resistance property. This material is available at cheaper cost and easily machinable to any desired shape as per the requirements. The research work in the present paper focuses on the optimization of tribological parameters as wear and friction of polymer composites with base material as polytetrafluoroethylene filled with 15%, 20% and 25% of glass fiber along with 5% MoS<sub>2</sub>. Molybdenum disulphide have good lubrication property and wear resistance. To optimize the tribological parameter nontraditional optimization technique's like TOPSIS is used. The experimentation is designed using the Taguchi Method. Further the detailed analysis if the polymer composites are done by using the X-ray diffraction analysis (XRD) and Scanning Electron Microscope (SEM).

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# Comparative Analysis for Hard Turning of Cryogenically Treated and Non Treated EN8 Steel by Using TNMG 160408 Insert

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**Abstract** — En8 steel is the most commonly used steel in applications like gears, bolts, pins, studs, etc. These applications of En8 material require it to be readily machinable and, at the same time, possess a sufficiently high amount of hardness and strength. A conventional heat treatment process used to enhance the mechanical properties of En8 steel consists of quenching and tempering. Cryogenic processing consists of quenching the material, then treating it at a temperature as low as  $-193^{\circ}\text{C}$ , followed by material tempering. Turning is becoming more popular for hardened steels as it has several benefits over grinding. The hard-turning process is defined as machining the work material having a hardness greater than 45 H.R.C. PCBN or hardened inserts are dominant tool materials for hard turning applications due to their high hardness, high wear resistance, and high thermal stability. Compared to grinding operations, hard turning has higher material removal rates, the possibility of greater process flexibility and lower energy consumption. The objective of the present work is to compare the results obtained by cyo-treated and non treated workpiece and to establish a correlation between cutting parameters such as cutting speed, feed rate and depth of cut with machining force, material removal rate and surface roughness on both cryo-treated and non treated EN8 workpieces. The TNMG inserts with a chamfer edge profile are used for turning. It is found that the use of lower feed value, lower Depth of cut with the cutting speed 135 and 180 m/min ensures minimum cutting forces, surface roughness and high M.R.R. 235m/min, 0.2 mm/rev, and 0.5 mm is the optimum parameter obtained by Grey Relational Analysis.

**Keywords** — EN8 Steel, Cryogenic treatment, Material Removal Rate (M.R.R.), Force Measurement, Surface Roughness, Responce Surface Methodology (R.S.M.), Grey Relational Analysis. (G.R.A.)

## I. INTRODUCTION

### A. Turning

Machinability is defined as the ease of machining a material, characterized by low cutting forces, high material removal rate, good surface finish, accurate and consistent workpiece geometrical characteristics, low tool wear rate and good curl or chip breakdown chips etc.

### B. Hard Turning

Hard turning is performed on materials with hardness within 45–68 Rockwell range using various tipped or solid cutting inserts, preferably hardened coated inserts, CBN or PCBN. The hard turning process differs from conventional turning because of the workpiece hardness, the required cutting tool, and the mechanisms involved during chip formation. [1,7]

### C. Induction Hardening

The hardening process hardens the steel, and tempering increases the toughness. The conventional hardening and tempering processes are carried out on the specimens. The hardening process consists of heating the specimen to austenitizing temperature, typically within the range of 815 to 870  $^{\circ}\text{C}$ , followed by oil quenching.

### D. Cryogenic Treatment

Cryogenic material processing is only done after hardening of the material, and post cryogenic treatment tempering is mandatory. In this study, the process followed is austenitizing to  $850^{\circ}\text{C}$ , followed by oil quenching until room temperature is reached; after oil quenching, the material is brought down to a temperature of  $-193^{\circ}\text{C}$  with the ramp down rate of  $0.5^{\circ}\text{C}/\text{min}$ . Once the cryogenic temperature was achieved, the specimen is held at that temperature with a holding time of 24 hours. After that, the material is brought to room temperature with a ramp-up rate of  $0.5^{\circ}\text{C}/\text{min}$ . Double tempering was performed post cryogenic treatment at  $150^{\circ}\text{C}$  for 1 hour. [29]



# Detection and Reconstruction of Line Scratches in Old Motion Picture

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**Abstract:** It is very hard to detect line scratches in videos. Scratches are not always vertical and may present in multiple frames, so it requires spatial and temporal information to identify true scratches. The problems in scratch detection are structure, texture, noise and false detection. Abrasion of film material to mechanical part of projection mechanism is main reason for scratches. It is required to fill the information to reconstruct the image. Here it explains spatial algorithm, temporal filtering and scratch filling. Spatial algorithm uses the current frame information to detect scratch inside the frame. Temporal filtering results in true scratch detection by filtering false detection. The temporal filtering uses the concept of motion estimation. Scratch filling is done on the basis of interpolation. To get fine results pre-processing is essential. Results of temporal filtering show the detection of line scratches and scratch filling step provides betterment in frame by reconstructing the detected scratches.

## I. INTRODUCTION

Incredible amounts of old film material present in film documents, the rebuilding of old movies is a matter of interest in this area. The automated tool must be designed for line scratch detection and reconstruction. Typical defects in the images are blotches, dust or dirt, flicker and line scratches. Scratches are caused due to friction of film to mechanical part of projection. The information of the physical inception of line scratches might be checked at [1]. Scratches in images may be represented by dark or bright lines. Possibly these scratches are considered as vertical and straight but it is not the case always. These shortcomings also represent the normal characteristic of temporal behavior, saying that line scratches stays in the same or a similar space position for few image sequences. The combination of spatial detection and temporal filtering can also be found in [16] and [17].

However, these attributes are truly factor, making line scratch identification and rebuilding it is an especially troublesome test. This paper presents three algorithms. 1) Presents the pixel-wise Line Scratch Detection (LSD), which depends on contrario methodology [2] to make it robust in nature to presence of noise. 2) Algorithm based on temporal filtering to remove false detection. This algorithm uses the motion coherence which is based on the consideration that scratch moves in same manner as in the next scene or frame are false scratches. Since such type of scratches are parts of video. 3) Algorithm for filling the scratches with true information to perform reconstruction of frames. The use of interpolation makes this tedious job of reconstruction easy.

Figure 1 shows the different steps of proposed work. The algorithm is applicable on still image so the first step is to convert video to frame. After converting video to frame the next step is to perform preprocessing. The preprocessing is required to remove noise if any in the frame and results in better detection of line scratches. To detect the scratch in the frame, firstly the pixel wise line scratch detection criteria is used, this criteria produces robust result against noise and texture. The use of contrario technique [2] makes the algorithm robust. The use of this method reduces the false detection. Still there are some scratches which are not true and are part of images; to remove such scratches temporal filtering technique is used.

The use of temporal filtering removes the false detection left over in pixel wise detection. The concept of motion coherence is used to removes false scratches. The scratch filling step includes the interpolation technique to find out missed information in images, ultimately results in scratch filling.

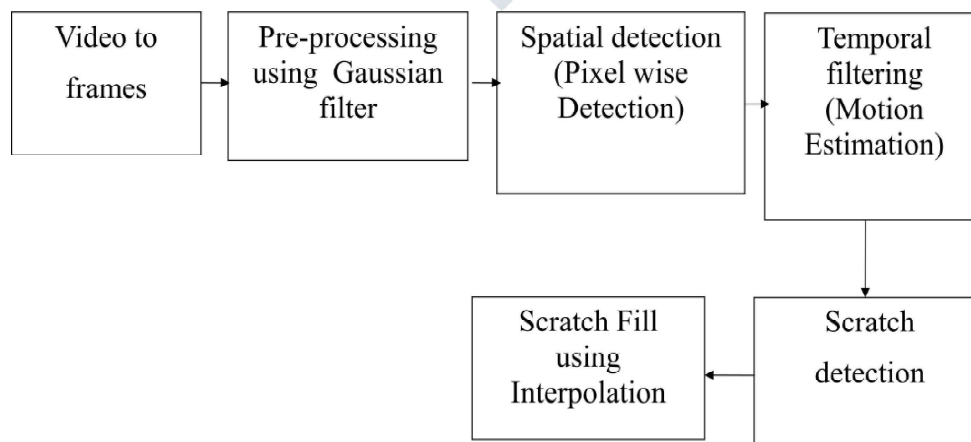


Fig. 1 Flow of proposed algorithm

# FACE RECOGNITION USING ORIENTED LOCAL HISTOGRAM EQUALIZATION

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**Abstract :** In this paper algorithm for illumination compensation is implemented on human face recognition under different lighting conditions. Many researchers gave good results by compensating of low frequency illumination, or capturing of high frequency edges. A simple but effective method namely oriented local histogram equalization which compensates illumination and gives richer information on the orientation of edges is implemented. The features OLHE gives good results when different lighting conditions occur. The recognition rate accuracy has been improved when proposed algorithm for lighting compensation is used.

**IndexTerms – Face recognition, illumination compensation, histogram equalization.**

## I. INTRODUCTION

Many researchers have been worked on human face recognition in the last decades. Face recognition has been made rapid progress but still it is unsolved because of different illumination conditions and head orientation in faces. Some researchers tried to remove illumination effects. The image is product of reflectance and illumination. In digital images illumination is due to low-frequency components [2] of images, while edges belong to high-frequency component [3]-[5]. Many researchers have used histogram equalization technique for compensation of illumination variation [10]. The limitation of histogram equalization is that it operates only when input image contains high intensity information.

The other method having directional histogram namely oriented local histogram equalization (OLHE) used for detecting edges in different directions in given input image.

## II. LOCAL HISTOGRAM EQUALIZATION

The method with the directional histogram namely oriented local histogram equalization (OLHE) [1] is extension of local histogram equalization [1] (LHE), because oriented local histogram equalization (OLHE) detects the edges and their orientations, while LHE does not. In LHE, the histogram equalization of each pixel in given image of size  $m \times n$  can be performed by using,

$$f_h(x) = \left[ \frac{cdf(x) - cdf_{low}}{m \cdot n - cdf_{low}} \cdot (G - 1) \right] \quad (1)$$

Where  $x$  is intensity of the pixel in a given image,  $cdf(x)$  is the function to calculate Cumulative Distribution Function (cdf) of the histogram,  $cdf_{low}$  is value of pixel with low intensity, and  $G$  is the gray values. We define  $j \equiv m = n$ . By considering  $3 \times 3$  window we got nine LHE operators. For LHE, center pixel of  $3 \times 3$  need to be processed itself. We can define LHE operators as,

$$L_j^{\xi, \eta}(I_{m \times n}) = I'_{m \times n} \quad (2)$$

The  $f_h(x)$  is used to calculate new intensity of each pixel of given whole image.

## III. ORIENTED LOCAL HISTOGRAM EQUALIZATION

The Local Histogram Equalization method (LHE) can be converted into oriented LHE by changing the center pixel positions. The remaining eight operators other than center are directional and oriented and they are called as oriented local histogram equalization (OLHE) operators. For given input image OLHE method produces eight OLHE images. The definitions of OLHE operators,

$$\begin{aligned} O_j^{11} &= L_j^{\left(\frac{j-1}{2}, -\frac{j-1}{2}\right)} & O_j^{12} &= L_j^{\left(0, -\frac{j-1}{2}\right)} \\ O_j^{13} &= L_j^{\left(-\frac{j-1}{2}, -\frac{j-1}{2}\right)} & O_j^{21} &= L_j^{\left(\frac{j-1}{2}, 0\right)} \\ O_j^{23} &= L_j^{\left(-\frac{j-1}{2}, 0\right)} & O_j^{31} &= L_j^{\left(\frac{j-1}{2}, \frac{j-1}{2}\right)} \end{aligned}$$

# DRLBP based edge texture features for Object Recognition with SIFT

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## ABSTRACT

Category recognition system will be developed for application to image retrieval. This paper proposes two sets of novel edge-texture features, Discriminative Robust Local Binary Pattern (DRLBP) and Ternary Pattern (DRLTP), for object recognition. By finding the limitations of Local Binary Pattern (LBP), Local Ternary Pattern (LTP) and Robust LBP (RLBP). DRLBP and DRLTP are proposed features by analyzing with HOG and SIFT features for better performance. For classification purpose linear SVM classifier is used. Furthermore, the proposed features retain contrast information necessary for proper representation of object contours that LBP, LTP, and RLBP discard. Our proposed features are tested on CALTECH 256 Data set. Results demonstrate that the proposed features outperform the compared approaches on most data sets.

**Keywords-** DRLBP, DRLTP, SIFT, HOG, Feature extraction and SVM

## 1. INTRODUCTION

Object recognition is divided in two parts category recognition and detection. Category recognition is used to classify an object into one of several predefined categories. Detection is used to distinguish objects from the background. Typically, objects have to be detected against cluttered, noisy backgrounds and other objects under different illumination and contrast environments. Performance of object recognition can be improved by discriminating the object from the background or other objects in different lightings and scenarios.

Object recognition features are categorized into two groups sparse and dense representations. For sparse feature representations, interest-point detectors are used to identify structures such as corners and blobs on the object. A feature is created for the image patch around each point. Dense feature representations, which are extracted at fixed locations densely in a detection window, are gaining popularity as they describe objects richly compared to sparse feature representations.

LBP is robust to illumination and contrast variations as it only considers the signs of the pixel differences. However, it is sensitive to noise and small fluctuations of pixel values. To handle this, Local Ternary Pattern (LTP) has been proposed. In comparison to LBP, it has 2 thresholds which creates 3 different states as compared to 2 in LBP. It is more resistant to noise and small pixel value variations compared to LBP. LBP and LTP differentiate a bright object

# Development of analysis curves for reinforced concrete beam sections based on simple approach of mechanics

Arshad K. Hashmi, Syed Muhammad Ibrahim, Mohammed Jameel and Alok Madan

A mechanics based simple approach is presented to develop curves which illustrate primarily the relation between stresses in not yielded reinforcement ( $f_{st}$ ), coefficient of moment of resistance ( $R_u$ ) and the percentage of tensile and compressive reinforcement ( $f_{sc}$ ) for reinforced concrete (RC) sections. The basic principles of mechanics such as equilibrium of forces, constitutive relationship of different constitutive materials RC sections and compatibility of strains are used to develop the different curves. Prime gain of the proposed approach is that it surpasses the requirement of iterative procedure needed for strain compatibility. Accuracy of the method is demonstrated by comparing the results with the actual curves derived based on iterative procedure of stain compatibility method. Step wise calculations are illustrated through determining  $R_u$  for particular value of  $P_t$  (e.g. for singly beam sections) and determining  $P_t$  and  $P_c$  for particular value of  $R_u$  (e.g. for doubly beam sections).

**Keywords:** Force equilibrium; strain compatibility; constitutive law of materials; ultimate moment of resistance; doubly RC beam; singly RC beam.

## 1. INTRODUCTION

Due to the ductile behaviour of steel, the reinforcing steel can sustain very high tensile strains. Following yielding, the ultimate strain in the reinforcing steel can be in the range of 0.12 to 0.2. However in comparison to reinforcing steel the concrete can accommodate very less compressive strains; the ultimate compressive strain of concrete is in the range of 0.003 to 0.0045 only. Thus the final collapse of a RC beam section at ultimate limit state of collapse is caused inevitably by the crushing of the concrete in compression, regardless of whether the tensile steel has yielded or not [1].

When the steel has not yielded, the true location of neutral axis is obtained by a trial-error method, called strain compatibility method involving following steps

- Assuming the suitable initial trial value of neutral axis ( $x_{u1}$ )

- Determine the strain at tensile reinforcement level by considering strain compatibility.
- From constitutive law find the reinforcing stress in steel at the corresponding strain.
- Using equilibrium condition (i.e. equating tensile force with compressive force) the actual depth of the neutral axis ( $x_u$ ) can be found out.
- If the values of  $x_u$  and  $x_{u1}$  are with the chosen range of proximity, it is assumed that the assumed trial value of neutral axis i.e.  $x_{u1}$  is correct for finding out the stress in the unyielded reinforcement. Otherwise repeat the all above steps with the improved (i.e. average) trial value of  $x_{u1}$ .

Thus determining the strain distribution that is consistent with the assumed position of neutral axis is a laborious procedure. Generating the  $R_u - P_t$  and  $P_t - P_c$  curves for particular value of  $R_u$  involves iterative process and is computationally rigorous. To avoid this rigorous procedure

# A LITERATURE SURVEY: A NEW FUSION MODEL FOR CLASSIFICATION OF THE LUNG DISEASES USING GENETIC ALGORITHM

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**Abstract**— Lung is the complex organ that consists of spongy, elastic tissue equipped with structures that infuse our blood with fresh oxygen while ridding it of carbon-dioxide. Lung diseases are mainly occurred as airway disease, lung tissue disease and lung circulation disease are studied. In the computerized detection and classification of lung image five main methodologies are used. They are image preprocessing, segmentation, feature extraction, feature selection and classification. Automatic classification of lung diseases in computed tomography (CT) images is a critical diagnostic device for computer-aided diagnosis system. In this study, we propose another image based feature extraction strategy for classification of lung CT images. A novel combination based strategy was produced by joining the Gabor filter and Walsh Hadamard transform features utilizing median absolute deviation (MAD) method and consequently, it has the benefits of the both models. The system has been tried with various genuine Computed Tomography lung images and has accomplished agreeable outcomes in classifying the lung diseases.

**Index Terms**— Fusion, Pre-processing, feature extraction, feature selection, classification, genetic algorithm.

## I. INTRODUCTION

Lung diseases are most common medical condition to detect and diagnose in the world [1]. Ten millions of people suffer by lung disease in U.S. Smoking, genetics and infections are the most common lung disease. The lungs are part of a complex apparatus, expanding and relaxing thousands of times each day to bring in oxygen and expel carbon dioxide. The lung diseases are detected in various kinds of image based on choosing the 3D and 2D features. Some of them are Computed Tomography (CT) [2], High Resolution Computed Tomography (HRCT) [3], Multi Detector Computed Tomography (MDCT) each has special view that helps to diagnose. A lung disease affecting the airways includes Emphysema disease. Lung diseases affecting the alveoli (air sacs) include Lung Cancer.

### Emphysema

Emphysema is a long-term (chronic) lung disease and a main type of Chronic Obstructive Pulmonary Disease. Individuals with emphysema experience issues breathing because of a constrained capacity to blow let some circulation into. The most common cause of this disease is smoking. It is estimated by the aberrations of PF tests [4]. Emphysema is a long-term (chronic) lung disease and a fundamental sort of Chronic Obstructive Pulmonary Disease. People with emphysema have difficulty breathing due to a limited ability to blow air out. The most common cause of this disease is smoking. It is estimated by the abnormalities of PF tests [4].

### Lung Disease

There are numerous disorders when parenchyma is affected and is generally referred as diffuse parenchyma lung disease (DPLD) or Interstitial Lung Disease (ILD) [3]. The various lung diseases are:

- Lung Disease Affecting the Airways (Bronchial Signs)
- Lung Disease Affecting the Air Sacs (Alveoli)
- Lung Disease Affecting the Interstitium
- Lung Disease Affecting the Blood Vessels
- Lung Disease Affecting the Pleura
- Lung Disease Affecting the Chest Wall

## II. METHODOLOGY

The most common methodology for classification of lung disease can be shown in the Fig.1.

# Classification of Leaf diseases using Texture Feature and KNN Classifier.

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**Abstract:** Leaf diseases are one of the common factors that are responsible for the decrease in plant growth. Plant diseases are analyzed with their leaves. Many researchers have analyzed the different methods to detect the leaf diseases but the evaluated results are not appropriate enough. So, in this paper we have presented support vector machine (SVM), KNN and Neural Network for plant leaf disease detection and classification. Here, the disease affected dataset of plant leaves is considered that is suffered with four diseases, curly blight, Late blight, Black rot and Healthy. The main objective of this paper is to detect the disease affected portion of leaf and healthy portion of leaf. We have calculated the percentage of leaf affected portion with their classification. Overall results are evaluated in the form of accuracy of proposed approach.

**IndexTerms -** Leaf Disease, K-means clustering, SVM, KNN, Neural Network.

## I. INTRODUCTION

It has been found that there is the existence of more than 1.7 million living species on the earth surface. Out of this huge number of living algae, animals, plants and humans; only plants are the species that are essential to make life cycle for the human life. [9] Plants provide a way of living to humans in the form of breathing oxygen to other essential resources. A plenty of medicines and food bases are the gift of plants to humans. So, plants are essential components of human life and needed to be protected at each stage. [10] In plants, major useful species is known in the form of agriculture crops. These crops are the feed for more than 70% of our country population. But the production of crops can be affected by diseases and these diseases are not visible with naked eyes. Plant diseases are analyzed from the affected leaf. [11] One method to detect these diseases is manually detection with the help of some botanic expert but manually detection of leaf diseases is much laborious and time consuming task. So, there is the need of some autonomous method.

Plant leaf disease is only vital factor which reasons important for reduce the quality and amount of plant generation. Identification and grouping of plant leaf diseases are critical assignment to build plant efficiency and financial development. Discovery and characterization are one of the fascinating points and considerably more talked about in designing and IT fields.

Detection of plant leaf disease is very difficult in agriculture field. If identification is incorrect then there is a huge loss on the economic value of market and production of crop. Leaf disease detection requires background knowledge in the plant diseases, and also requires the more processing time. So we can use image processing for detection of leaf disease in MATLAB. Identification of disease follows the steps like loading the image, contrast enhancement, converting RGB to HSI, extracting of features and SVM.

There are different methods emerge to identify the plant disease, for example, thresholding, district developing, grouping, watershed, and so forth. To identify plant illness the picture ought to experience pre-processing, division, highlight extraction and characterization forms. The pre-handling is a change procedure of picture information to smother's undesirable damage or upgrades some image highlights essential for further processing [1].

The segmentation procedure for segment an image in significant areas then it is crucial procedure over which images are highlights and separated. There are different highlights of an image, for example, dark level, shading, surface, shape, profundity, movement, and so on. Arrangement process is utilized to order the given information in number of classes and clusters. It extracts some features and from the feature it select particular feature and classify data [2].

## II. LITERATUREREVIEW

There is the existence of the list of methods used by researchers for the detection of plant leaf diseases.

Methods introduce an image processing-based approach that is used to detect leaves, stem's disease. They tested this program on five diseases in which the plants had an impact; they are: initial shocks, Cottony mold, Aisha mold, and late sweat, small white, proposed approach is based on image processing. In this approach, images on hand are broken by using K-means technique. In the next stage, the images containing the segment are passed throughout the Pre- skilled neural network. The result show that proposed approach leaves a lot to help in the automatic and accurate detection of disease. Based on our experiment, the developed