

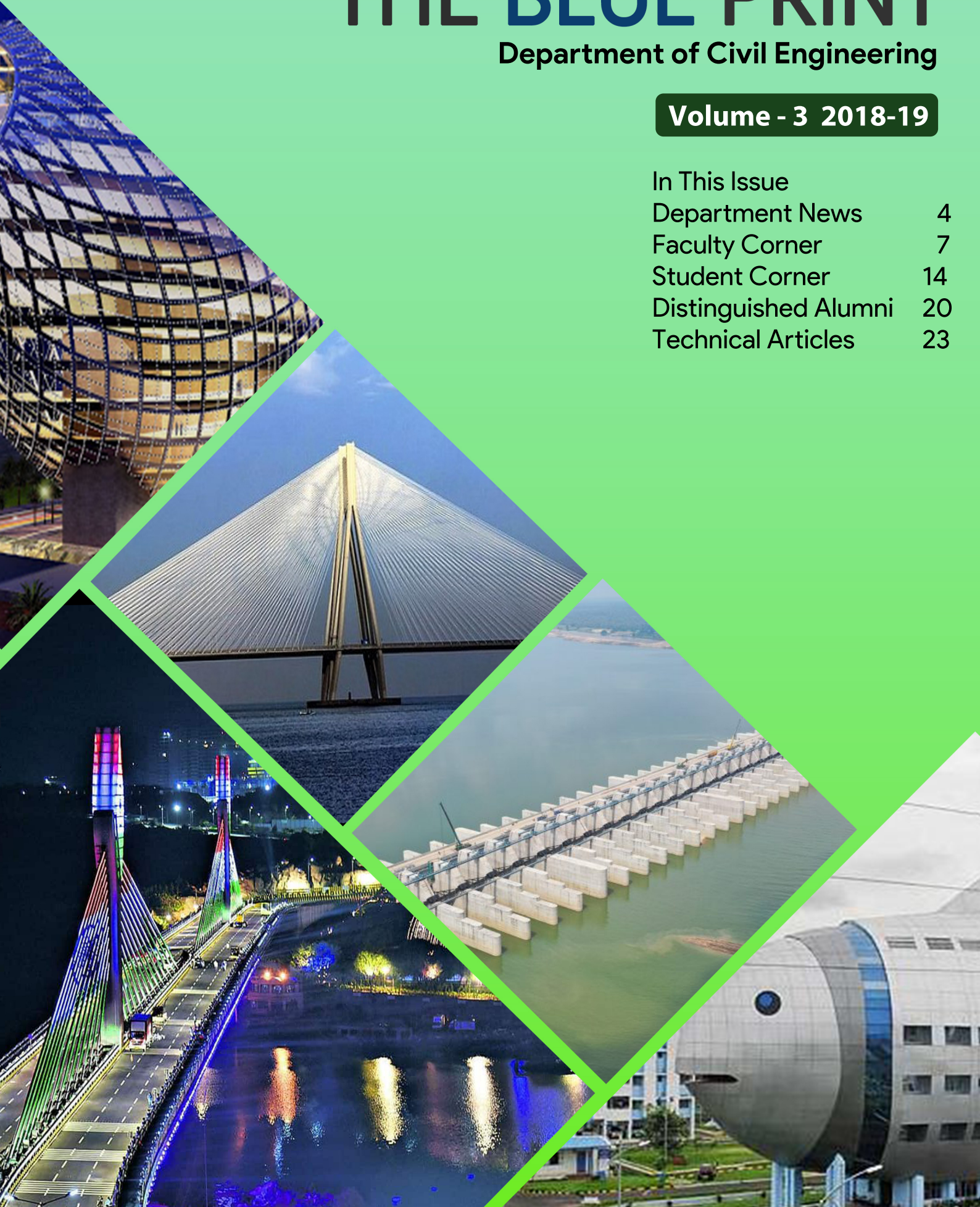
THE BLUE PRINT

Department of Civil Engineering

Volume - 3 2018-19

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DEPARTMENT OF CIVIL ENGINEERING

VISION

To develop Civil Engineering Department as a Centre of Excellence for imparting value-based education to the students at under-graduate and post-graduate level to meet industry needs and to develop as a major research centre to meet the national and international standards.

MISSION

- To impart in-depth and up-to-date knowledge of Civil Engineering, stressing concepts with focus on character enhancement, leadership qualities, effective communication, social responsibility, pursuit of lifelong learning and professional development.
- To provide a platform to students to engage in innovative research work.



DEPARTMENT OF CIVIL ENGINEERING FACULTY AND STAFF

Principal's Message

It gives me immense pleasure to pen down few words to the Civil Engineering Department Newsletter which is meant to accumulate the latent writing skills of our students. It is a bird's view of the department's achievements, activities and events. It brings the students and teachers onto a common platform to share their ideas and display their creative talents. Present day education is more than acquiring knowledge. It demands a holistic development in the individual to meet the requirements. We at VNR VJIET, aim in all round development to transform the students both personally and professionally as multifaceted individuals to succeed in this era of technological advancements. So, we have introduced many initiatives and have excelled in every initiative that we introduced to make them competent. The newsletter is one such attempt giving students a platform to converse and disseminate information related to their field. I congratulate the team in their efforts in bringing out this newsletter.



**Dr. C.D. Naidu, Principal,
VNRVJIET**

Editorial Note



**Dr. A. Mallika,
Prof. & HoD-CE,
VNRVJIET**

The civil engineering department of VNRVJIET is in a period of rapid growth and diversification that is strengthening our influence within the VNRVJIET community, Hyderabad, and the broader state and the nation. I am pleased to present the Third edition of the newsletter which highlights a few of these activities. Department is recognized as Research Centre by JNTUH and awarded with GHMC Third Party quality control works consultancy. We have also added one outstanding Distinguished Visiting Prof. M.R. Madhav to our Civil Engineering family at VNRVJIET to mentor us. I take pride in our alma matter for their continuous contribution with financial support (special acknowledgements to Mr. Rishi Tirupari) to economically weak and meritorious students and mentoring through motivation and guidance lectures. Department has also established a new structural engineering laboratory with a loading frame set-up of capacity 1000kN. Our team is making continuous efforts in exploring new teaching and learning methodologies and forwarding research contributions. I congratulate entire team for their sincere and continuous efforts in taking the department into the track to achieve its vision.

DEPARTMENT NEWS

ACHIEVEMENTS:

- ▲ Department of Civil Engineering is accorded with GHMC Third party Quality Control Consultancy works and generated a revenue worth Rs.62.00 lakhs in 2018-19.
- ▲ The Department of Civil Engineering is also involved in regular consultation work and produced Rs.1.54 lakhs of revenue during 2018-19.
- ▲ JNTU, Hyderabad recognized Civil Engineering department as Research centre.
- ▲ Department catered training sessions for TS Forest department for training (3 days) in November 2018 for forest officers on ARC VIEW software.
- ▲ Department of Civil Engineering had launched Newsletter - THE BLUEPRINT (Second Edition) in A.P.J Abdul Kalam Auditorium on 23rd March 2019.
- ▲ Professor M. R. Madhav is mentoring the department in specific Geotechnical wing under AICTE – INAE Distinguished Professor scheme.
- ▲ Faculty published 26 journal papers and 29 Conference papers in various web of Science, Scopus indexed, UGC publications in 2018-19.



Launch of Newsletter THE BLUEPRINT- SECOND EDITION

NEW FACILITIES CREATED:

The Department of Civil Engineering has procured the facility of Loading Frame Test set-up worth Rs. 28.00 Lakhs in the year 2020. The loading frame test set-up has an axial load capacity of 1000 kN and lateral load capacity of 200kN. This loading frame can be used for testing full-scale reinforced concrete members like beam, column, and slab. Beams of maximum length 2.1 m, columns of maximum height 1.1 m and slab of section 1.5 m X 1.5 m can be tested using this loading frame test set-up. Also, the rotational capacity of beam-column joints may be evaluated. Precast manhole covers of grade HD-40 were designed and tested using this loading frame test set-up.



Loading Frame set-up

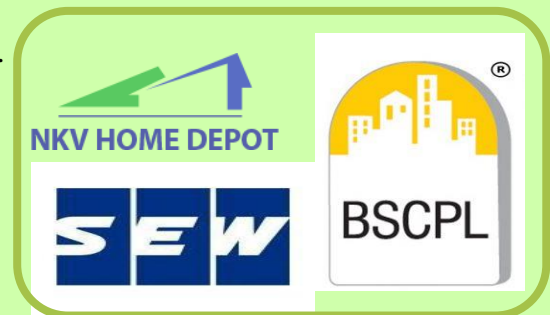
BEST PRACTICES:

- Department of civil engineering has extended its services for clean & green campus and Environmental Dashboard.

MEMORANDUM OF UNDERSTANDING (MoU) INITIATIVES:

Department has renewed its MoU with the following industries.

- BSCPL Infrastructure Ltd
- SEW Infrastructure Ltd.
- NKV Depot



GUEST LECTURES:

- ☞ Dr. C. Naveen Kumar, Associate Professor, VNR Vignana Jyothi Institute of Engineering and Technology delivered a lecture on “Artificial Intelligence-Shaping the Future of Civil Engineering” on 7th September 2018.
- ☞ Prof. M. R. Madhav, distinguished visiting professor, AICTE -INAE delivered a lecture on “Engineering of Ground” and “Joy of Civil Engineering” on 14th and 28th September 2018, respectively.
- ☞ Mr. Suraj Peri, Co-Founder, GRADVINE delivered a lecture on “Best Universities for M.S in U.S.A for Civil Engineers” on 7th October 2018.
- ☞ Prof. M. R. Madhav, distinguished visiting professor, AICTE -INAE delivered a lecture on “Golden Era for Geotechnical Engineers (1951-2011)” on 19th October 2018.

- ☞ Mr. Sandeep, Councillor, CII delivered a lecture on “Introduction to Green Buildings” on 29th October 2018.
- ☞ Mr. V. Paul. C. Charlesraj, Associate Professor and Project Director, RICS school of Built Environment delivered a lecture on “Project Management-Project Manager’s Perspective” on 21st January 2019.
- ☞ Mr. Srinivas Kothari, Assistant General Manager in JCE, TATA Consulting Engineers Ltd. delivered a lecture on “High Rised Structures - A Case Study on Burj Khalifa” on 20th February 2019.



Prof. M. R. Madhav, distinguished visiting Professor.



Mr. Suraj Peri, Co-Founder, GRADVINE



Mr. Srinivas Kothari, Assistant General Manager, TATA Consulting Engineers Ltd

FACULTY CORNER

JOURNAL PUBLICATIONS:

- Dr. Mallika Alapati and Nikhila Kanchi, 2018 “Comparative Study on Dynamic Behaviour of Different Building Frames Subjected to Blast Loads”, Journal of Advanced Research in Dynamical & Control Systems, Vol. 10, No.08 (Special Issue), pp.671-677, 2018.
- Dr. Kolli Ramujee,2018 “Engineering properties of flyash based geopolymer concrete”, Journal of Structural Engineering, Vol.45, No.4, pp No: 385-394.
- Dr. B. Narendra Kumar and T Nikhil Singh, 2018 “Development of high strength self-consolidating concrete containing fly ash and GGBS”, International journal of Research in Engineering and Technology, Vol 7, Issue 9, pp no. 80-84.
- Dr. B. Narendra kumar, and Dr. kolli Ramujee,2018, “Investigation on Relationship between Compressive and Flexural Strength of Binary Blended Hybrid Fiber Reinforced Geopolymer Concrete”, Journal on Structural Engineering, Vol 7, Issue no 2, pp 57-62.
- Mr. Suresh Kommu, SS. Asadi, A. V.S. Prasad, 2018 “Leaching behavior and strength characteristics of black cotton soil stabilized with fly ash”, Materials today: Proceedings (Elsevier), ISBN: 2214-7853
- Dr. S. Rakesh, and Dr. P. Rathish Kumar, 2018 “A study on the parameters influencing flexural bond stress in reinforced concrete”, Structures, Vol 16, pp.No.198-207.
- N Akhil, Penki Ramu, Shiva Shankar Kalyan Shetty,2018 “Experimental investigation on the rut resistant surface layer with inclusion of marble dust and sisal fibres”, Materials today: Proceedings (Elsevier), ISBN: 2214-7853.
- Ch. Soujanya, G Akhila Priya, Penki Ramu, Dr. C. Naveen,2018 “A Novel Technique to design Optimum Bituminous mix Designs based on R studio and Autograph with Integration”, Materials today: Proceedings (Elsevier), ISBN: 2214-7853.
- Penki Ramu, Ram Kumar, B.A.V, Sandeep Reddy G, Praveen B, 2018 “Road Maintenance through Community Contracting as an Instrument of Rural Development in India by Mobile Applications”, International Journal of Recent Technology and Engineering, Volume-7 Issue-4, 227-233.
- Dr. A. Mallika, and J. Sowmya,2019, “Influence of Patch Location on Damage Detection of Smart Bar Using Emi Technique”, i-managers journal on civil engineering, Vol-9, No.2, pp.no.62-68.
- Dr. B. D. V. Chandra Mohan Rao, and A. Kavya Reddy, 2019, “Modal Analysis of Hyperboloidal Shell Structures”, i-managers journal on civil engineering, Vol-9, No.2, pp.no.55-61.
- Dr. B. D. V. Chandra Mohan Rao and S. Isha Patel, 2019, “Effect of Geometric Parameters on Seismic Performance of RC Chimneys”, i-managers journal on civil engineering, Vol-9, No.2, pp.no.46-54.

- Dr. B. Narendra Kumar, and Dr. Kolli Ramujee,2019, “Effect of Quartz materials on the development of High Strength (M 100) Self-Compacting Hybrid Fibrous Concrete”, The Indian Concrete Journal, pp.no.52-58.
- Dr. Purnendu Narayan Singh, Akavaram Sasya Reddy, and Ankathi Laxmithrishool,2019 “Loss of Water from Tanks in Telangana, India due to Evaporation and Seepage”, International Journal of Engineering, Applied and Management Sciences Paradigms, Vol.54, Issue 2, pp.No: 129-136.
- Mr. Suresh Kommu, SS Asadi,2019 “Quality Assessment of Borewell and Tap Water in and Around Hyderabad City”, International Journal of Recent Technology and Engineering, Volume-7, Issue-6C2, pp.No: 594-598.
- Dr. A. Ramesh, B. Praveen, and M. Kumar,2019 “Prediction of Seat Belt Use and Assessment of Perspective Behaviour Among Indian Drivers”, International Journal for Traffic and Transportation Engineering, ISSN: 2217-5652.
- Dr. A. Ramesh, M. Satish Goud, V. Venkat Rama Kumar, V. Vinayaka Ram, 2019 “Influence of Bitumen Modification and Gradation on Performance Characteristics of Asphalt Pavements”, Journal of The Institution of Engineers (India): Series A, ISSN: 2250-2149, pp. No. 1-10.
- Dr. A. Ramesh and Karishmapadhy,2018 “Influence of acid modification in asphalt layer when reinforced with glass fibre”, Global journal of Engineering Science and Researches, Vol-5, No.12, pp.no.293-303.
- Dr. A. Ramesh and Pakanati Nagamani,2018 “A laboratory study on Reinforced HMA mix and evaluation of Rut depth using Finite Element analysis”, Global journal of Engineering Science and Researches, Vol-5, No.12, pp.no.261-271.
- Dr. A. Ramesh, P. Sai Shravani, and T. Rajani,2018, “Influence of silica in performance characteristics of asphalt mixes”, Global journal of Engineering Science and Researches, Vol-5, No.12, pp.no.253-260.
- Kanneganti Sravani, Suresh Kommu, S.S.Asadi , 2019 “Effect of Synthetic Fibres and Silica Fume on Behaviour of Expansive Soil”, International Journal of Recent Technology and Engineering, Volume-7, Issue-6C2,pp.No: 768-774.
- D Gopi Krishna, Mr. T Naga Teja and Dr. Naveen Kumar C,2018 “Pedestrian Delay Modelling using VISSIM at Mid-Block Section and Intersections on Urban Roads”, Indian Roads Congress, Vol-46, no.8 pp.No.39-44.
- P. Ramu, 2019 “Design of Bituminous Mixes for Heavily Trafficked Roads –A Boon to Indian Roads”, International Journal of Technical Research & Science”, International Journal of Technical Research & Science, Vol.4, No.6, pp. No: 378-384.
- Akhil Namala, Penki Ramu, Shiva Shankar kalyan Shetty,2018 “Influence of sisal fiber on Resilient modulus of Hot Mix Asphalt with addition of marble dust”, Journal of civil and construction Engineering, Vol.5, Issue No. 1, pp No. 8-23.

- Mrs. G. Lalitha, 2019 “Mechanical properties of concrete(m40) with copper slag as fine aggregate Conventional and NDT (rebound) testing”, International Journal of Technical Innovation in Modern Engineering & Science, Volume 5, Issue 6.
- V. Ramya Krishna and JYV Shiva Bhushan, 2019 “Slope Stability Analysis of overburden dumps”, Indian Journal of Geosynthetics and Ground Improvement, Vol 8, Issue No. 1, pp no. 26-32.

CONFERENCES PUBLICATIONS:

- Dr. Ramesh Adepu, Venkatesh Gajula, and Ramu Penki presented a paper on “Feasible Study on Geocells, Geogrid and Geotextiles as Geo-reinforcement In Subgrade” in SWAYAM, 2018.
- Dr. Durga Prasad, R Akhil Khambhammettu, and Isha Patel S presented a paper, “Studies on effective utilization of calcined and uncalcined zeolite in high performance ternary blended concretes” in SWAYAM, 2018, July,2018.
- Dr. Durga Prasad R, Sravan Kumar Siliveri, and Isha Patel S presented a paper on “Studies on effective utilization of copper slag fine aggregate in high strength concretes” in SWAYAM, 2018 July,2018.
- S. Sravan Kumar, S. Isha Patel, R. Durga Prasad presented a paper on “Studies on Effective Utilization of Copper Slag Fine Aggregate in High Strength Concretes” in TREES – 2018, September 2018.
- K.Akhil, S. Isha Patel, R. Durga Prasad presented a paper on “Studies on Effective Of Wollastonite in High Performance Ternary Blended Concretes” in TREES – 2018, September 2018.
- G Sandeep Reddy, CH Anudeep Reddy and P Ramu presented a paper on “Influence of Zeolite as Supplementary Cementitious Material in Pavement Quality Concrete” in TREES – 2018, September 2018.
- Mr. P Ramu, G Sandeep Reddy, A Bharath and R Manideep presented a paper on “Study on Utilization of Cinder Coal and Recycled Aggregates as Coarse Aggregate in Cement Treated Base” in TREES – 2018, September 2018.
- Dr. Rakesh Seimpu, Ramesh Adepu presented a paper on “A laboratory study on modified bituminous mixes with the inclusion of elvaloy polymer” in TREES – 2018, September 2018.
- Tejaswi Bijjala, Teja Tallam, K. M. Lakshmana Rao presented a paper on “Calibration of Fundamental Flow Model for Pedestrian at Mid-Block Sections on an Urban Road” in TREES – 2018, September 2018.
- Sai Prasanna Reddy, Teja Tallam, K. M. Lakshmana Rao presented a paper on “Calibration of Fundamental Flow Model for Pedestrian at Mid-Block Sections on an Urban Road” in TREES – 2018, September 2018.
- Sreeram and Dr. A Ramesh presented a paper on “Evaluation of Rutting Characteristics of HMA Mixture When Reinforced with Fibre Under Varying Packing Characteristics” in TREES – 2018, September 2018.

- Bellam Praveen, Dr. Ramesh Adepu, Molugaram Kumar presented a paper on “Evaluation of Rutting Characteristics of HMA Mixture When Reinforced with Fibre Under Varying Packing Characteristics” in TREES – 2018, September 2018.
- K. Sushmitha Singh and Dr. C. Naveen Kumar presented a paper on “A Study on Dynamic Traffic Assignment Using Different Methods for Urban Scenario” in TREES – 2018, September 2018.
- Dr. Rakesh Siempu and Dr. Rathish Kumar Pancharathi presented a paper on “Bond Strength of Concrete made with Recycled Aggregates from M Construction Demolition Waste” in Telangana State Science Congress, December 2018.
- Shiva Bhushan J.Y.V and Sai Kumar K. presented a paper on “Effective of rubber chips and quarry dust on compaction, FSI and UCS values of expansive soil” in National Conference on Advances in Frontier of Civil Engineering, December 2018.
- Dr. Durga Prasad R and M. Rajashekar presented a paper on “Effective of rubber chips and quarry dust on compaction, FSI and UCS values of expansive soil” in Two Day National Conference on Recent trends in Civil Engineering, February 2019.
- Mrs. Jyothirmai, Dr. Durga Prasad, Mrs. Jeevana Smitha, Kunal Agarwal presented a paper on “Effects of Contaminants in mixing water on the performance characteristics on cement concrete” in Two Day National Conference on Recent trends in Civil Engineering, February 2019.
- S. Sairam and Dr. Kadali Srinivas presented a paper on “Relation between Thermal Conductivity, Minerology, Cation Exchange Capacity and Specific Surface Area” in National Conference on Geotechnical Applications, March 2019.
- Manisha Vugge, Dr. CH. Nageshwar Rao and Dr. M.R. Madhav presented a paper on “Evaluation of Coefficient of Consolidation using Different Methods” in National Conference on Geotechnical Applications, March 2019.
- P Vinod Kumar G, Boya Manikanta R and Dr. Madhira Madhav presented a paper on “Ground Response Analysis and Liquefaction Susceptibility Assessment of Passighat Airport” in National Conference on Geotechnical Applications, March 2019.
- M Akhil Kumar, K Suresh, and Dr. M. R. Madhav presented a paper on “Optimization of Embankment Widening” in National Conference on Geotechnical Applications, March 2019.
- Vinodh Naik J, Penki Ramu and Srinivasa Rao T presented a paper on “GIS and AHP Methodology for parking site selection in Hyderabad City” in Advances in Sustainable Construction Materials, March 2019.
- P Narendra Kumar, Dr. A Ramesh and R Durga Prasad presented a paper on “A Study on Plastic Cell Filled Concrete Pavement with Partial Replacement of recycled Aggregate for Low Volume Road” in Advances in Sustainable Construction Materials, March 2019.
- Yashwanth Goud. S and Dr. R Durga Evaluation of Optimum usage of Copper slag aggregate in High Performance Concretes” in Advances in Sustainable Construction Materials, March 2019.

FACULTY SPONSORED FOR CONFERENCES/ SEMINARS/ WORKSHOPS/ FDPS/ OTHER PROGRAMS:

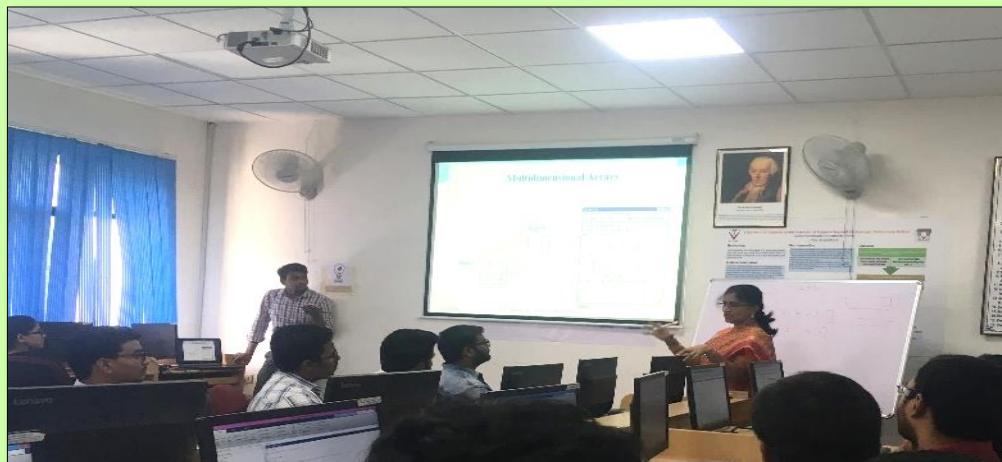
Programs organized:

- Department of civil Engineering has organized a 2 Day National Conference on “Transportation Research Efforts for Ecological sustainability, TREES-2018” on 28th - 29th, September 2018.



Release of Souvenir and Conference Proceeding during inaugural function at 2 – Day National Conference TREES 2018

- A Two-day workshop was organized on Soft Computing Skills on 30th & 31st August 2019.



Dr. Y Padma Sai, HoD – ECE, VNRJIET delivering a lecture on MATLAB

- The Civil Engineering Association (CEA) has conducted a one-day workshop on “Plumbing Design” as part of CONVERGENCE on 5th October 2019. The workshop was conducted in association with M/s Dhanush Engineering Services India Pvt. Ltd., Hyderabad.



Mr. Kishore of M/s Dhanush Engineering Services India Pvt. Ltd.,

FACULTY ACHIEVEMENTS/ RECOGNITIONS:

- Dr. A. Mallika, Professor & Head attended Board of Studies meeting as member in Department of Civil Engineering, JNTUH on 25th & 26th May 2018.
- Dr. R. Durga Prasad, Assistant Professor has been awarded with Doctor of Philosophy degree from IIT Madras on “Investigations on Self-Compacting High Performance Ternary Cementitious Systems” June 2018.
- Prof. Ch. Nageswara Rao, Professor Chaired technical sessions in the Symposium on "GEOPRACTICES – 2018” at JNTUH on 29th September 2018.
- Dr. K. Ravikumar, Associate Professor represented VNRVJIET in one day NPTEL-SPOC workshop at IIT Madras on 16th July 2018.
- Dr. Kadali Srinivas, Associate Professor was invited for the brain-storming session on Industrial By-products for Sustainable Development at IIT- Bombay, 2018. Under the aegis of Science and Engineering Research Board (SERB), Department of Science Technology (DST), the Ministry of Environment, Forest, and Climate Change (MoEFCC), Technology Information and Forecasting Assessment Council (TIFAC) and Central Pollution Control Board (CPCB). In view of the persistent and pertinent geo-environmental issues, concerning the management of industrial by-products and in line with “Swachh Bharat Mission”, the ambitious programme of Govt. of India.
- Dr. Kadali Srinivas, Associate Professor of Civil Engineering Department was invited as a speaker for the talk on “Advanced Instrumentation in Geomaterial Characterization” at JNTUH on 29.09.2018.
- Dr. S. Rakesh was awarded with Doctor of Philosophy in Civil Engineering from National Institute of Technology Warangal on 19th July 2018.
- Ms. K. Keerthi, Assistant Professor certified in Design course from MIT Sloan school & Emeritus Institute.
- Dr. K. Ravi Kumar (Associate Professor) and T. Srinivasa Rao (Assistant Professor) of Civil Engineering Department received funding of Rs. 1,00,000/- each for their proposals on “Geophysical

Investigation to find potential ground water recharge sites in Pragathi Nagar” & “Selection of suitable sites for vehicle parking in Pragathi Nagar, Kukatpally, Nizampet and Development of Mobile applications for showing parking sites to the vehicle users” respectively.

- T. Srinivasa Rao, Assistant Professor of Civil Engineering along with IT faculty made a presentation at GHMC, Hyderabad for funding proposal titled - "Identification of Encroachment of Government land using Geo spatial Technology" for an amount of 1.6 Crore Rupees on 25.02.2019.
- Dr. Kadali Srinivas, P. Arti Sudam, S. Sangeetha, JYV Shiva Bhushan have accorded with lifetime membership for Indian Geotechnical Society.
- Dr. Kadali Srinivas was invited to attend the World Congress on “Geology & Earth Science” as a speaker which is scheduled from 11th - 13th July 2019 at London, UK.



Dr. K. Ravi Kumar, SPOC -NPTEL, receiving ‘AA’ rated certificate from Prof. Bhaskar Ramamurthy, Director, IIT madras

Journal / Book Reviewers:

Dr. P. N. Singh	Journal of Civil Engineering(i-Manager)	Member Editorial board
Dr. A. Mallika	<ul style="list-style-type: none"> • Journal of structural Engineering (i-Manger) • Journal of Civil Engineering (SCOPUS) 	Reviewer
Dr. K. Ramujee	Journal of Civil Engineering(i-Manager)	Reviewer
Dr. A. Ramesh	International Journal of Civil Engineering, Springer Journal	Reviewer
Dr. Kadali Srinivas	Elsevier Publication: Ground Improvement with Geotechnical Site Investigation & Analysis and Design of Soil and Rock Excavation	Reviewer

FACULTY NPTEL ACHIEVEMENTS:

- Dr. B D V Chandra Mohan Rao, Professor have received a Topper Certificate from NPTEL for the courses **Strength of Materials** and **Matrix Method of Structural Analysis**.
- Dr. K Ravi Kumar, Associate professor have received a Topper Certificate from NPTEL for the course **Regression Analysis**.
- Mrs Sangeetha S, Assistant Professor have received a Topper Certificate from NPTEL for the course **Geosynthetics Testing Laboratory**.

SOCEITAL IMPACT PROJECTS:

The following UG projects focused on societal impact:

- *Experimental Study on Performance of Concrete Using E-Waste*
- *Expanded Polystyrene Panels as Green Building Material in Low-Cost Housing*
- *Improvement of Neighbourhood Transportation Systems*
- *Geophysical Investigation to Find the Potential Groundwater Recharge Sites at VNR VJIET*
- *Forest Fire Risk Mapping for Khammam District Using RS and GIS Techniques*

STUDENT CORNER

INDUSTRIAL VISITS:

- II B. Tech I semester students visited CII - Sohrabji Godrej Green Business Centre on 24.09.2018.
- III B. Tech I semester students visited PSV PRECAST Pvt. Ltd. and ULTRA CORE SYSTEMS, Balangar, Jadcherla on 27.09.2018 and 08.09.2018 respectively.
- IV B. Tech I semester visited Indian National Centre for Ocean Information Services on 18.09.2018.
- II B. Tech II semester students visited Survey Training Institute, SOI, Uppal, Hyderabad on 30.01.2019.
- III B. Tech II semester students visited on PEBS Pennar Engineered Building Systems Ltd. On 12.02.2019 and 30.01.2019.
- II B.Tech. and PG Students participated in “Green Building congress-2018” A Flagship event organized by IGBC.



Students visit for IGBC, Hyderabad during world green building week- 2018



Students at PEBS Pennar



Students at Survey of India

STUDENT ACHIVEMENTS:

- M.Tech. II Year student S. Sairam (17071D1213) got second prize for his presentation in National Conference “GEOAPPS-2019” on 30.03.2019 at IIT Hyderabad.
- Pasupulety Nikhil Kumar (17071A0159) got selected for TEP/ ISB (2018-2019) Programme.
- **43** students from IV B.Tech. were placed in reputed firms like **Ashoka builders, ACC, Amazon, Alienz, HSIL, Red Carpet, TCS, Hexagon, Corecompet & Capgemini.**
- G. Raghavender, K. Syed Eswar, Chandu Dirisipo, N Mahesh, R. Sameer Naidu, and K. Murali Krishna earned a Runner up prize in sporting competition ‘Vignan university inter collegiate tournament’ hosted by Vignan university.
- A team of three students V. Sai Sree, Sowmya and Harsha from CED volunteered in 4th National Cultural Fest for Deaf and Dumb.
- IV B.Tech. Student Anurag Vasam received a cash prize worth Rs. 1500/- by ACC Cements for securing highest mark in the subject concrete Technology.
- IV B.Tech. students Vaishnavi & Sana are nominated for award for academic excellence by Education Matters and Trinity College (DUBLIN).
- Mr. K. Bharath (16071A0182) and K. Prithvi Chandra (17071D1203) stood as toppers in the NPTEL online certificate courses Digital Land Surveying Mapping and Unsaturated soil Mechanics

- IV B.Tech. Student, Ghanta Bhavishya (15071A0117) had won the secured prize in Cultural Event at BITS Hyderabad.
- 20 students secured good score in GATE 2019.

CIVIL ENGINEERING ASSOCIATION (CEA), INDIAN CONCRETE INSTITUTE (ICI) STUDENT CHAPTER & IGBC STUDENT CHAPTER

CIVIL ENGINEERING ASSOCIATION:

World water day:

On the eve of World Water Day on 22nd March 2019, the Civil Engineering Association (CEA) has conducted a lecture on the theme of the year 'Leaving no one behind'. The lecture was delivered by Dr. P. N. Singh, Professor of Civil Engineering.



Dr. P. N. Singh, Professor of Civil Engineering

Indian Concrete Institute (ICI) Student chapter:

- Department of Civil Engineering, VNRVJIET have conducted a one-day technical civil engineering symposium "HORIZON" Knowledge meets existence on 23rd March 2019



Er. P. Surya Prakash, Founder and Managing Director of M/s Satya Vani Projects and Consultants Ltd., Hyderabad at the Inaugural Ceremony of HORIZON

As part of this technical civil engineering symposium, various technical events were conducted including

- Technical Quiz
- Design Green
- Paper presentations
- Tensegrity Structures
- Student Innovation Exhibition
- Scavenger Hunt
- Fine-Tune



Participants preparing a model during the event Tensegrity Structures of HORIZON



Evaluation of the Tensegrity Structures Dr. B.D.V. Chandra Mohan Rao, Professor and Dr. R. Durga Prasad, Assistant Professor



Faculty of Civil Engineering Department Dr. Ch. Nageshwara Rao, Professor, Dr. K. Ramujee, Professor, and Dr. B. Narendra Kumar, Professor evaluating the projects exhibited by the students as part of Student Innovation Exhibition of HORIZON

IGBC STUDENT CHAPTER

The Civil Engineering Association (CEA) and the student chapter of Indian Green Building Council (IGBC), VNRVJIET in association with the IGBC, part of the Confederation of Indian Industry (CII) has conducted one week World Green Building Week (24th-30th September 2018) campaign.

The list of activities conducted are:

- Visit to a Green Building on 24th September 2018.
- Creating awareness regarding mass transportation and car-pooling on 25th September 2018.
- An Expo of Green Products on 26th September 2018.
- Green Walkathon on 27th September 2018.
- Awareness on Green School to VRS & VJ Residential School Children on 28th September 2018.
- Guest Lecture on “Awareness on Green Building” & Signature Campaign on 29th September 2018.



Students creating awareness regarding mass transport and car-pooling at VNRVJIET



Mr. P. Gopi Ragunadh, Assistant Professor, CED giving a brief explanation to students on Geopolymer concrete bench (green bench)



Green Walkathon from INCOIS Junction to Amber Cheruvu, Pragathi Nagar



Green Walkathon at Kakateya Hills, Pragathi Nagar



CEA Team with VRS & VJ Residential School students



Principal Prof. C.D.Naidu, Director Prof. B.Chennakeshava Rao, Dean Prof. B.Narendra Kumar, and Head of the Department Prof. A. Mallika along with faculty, staff and students at Vijetha super Market, Pragathi Nagar

DISTINGUISHED ALUMNI

- Distinguished alumni Mr. Rishi Tirupari (2002-2006) sponsored tuition fee for two meritorious and economically unprivileged students Mr. K. Sai Charan (16071A0125) and Mr. I. Pavan Kalyan (17071A0182).



Mr. Rishi Tirupari



K. Sai Charan



I. Pavan Kalyan

ALUMNI STORIES

My Success Story

- by **Saisantosh Vamshi Harsha Madiraju**

My inspiration to become an Environmental Scientist started at VNR VJIET. I decided to get into the Ph.D. in Environmental Engineering in the second year of my bachelor's degree in 2013. I got first inspiration and encouragement from Ms.Soujanya madam, Ex-Faculty of the Department of Civil Engineering. During my extra hours and I completed three mini-projects titles "Physical and chemical analysis of Musi River" under Ms.Soujanya Madam, "Maida as a replacement for cement in concrete", and "Using cotton as a fiber in the concrete" under Dr.B.Narendra Kumar sir, and a major project "Design of Eco-friendly indoor air purifier to reduce concentrations of CO₂, SO₂ & NO₂" under the guidance of Mr.P.V.S.Gopi Raghunadh Sir. Dr.K.Ravi Kumar provided excellent guidance to design my career. I later published a research journal article on it with the title "Prototype of Eco-Friendly Indoor Air Purifier to Reduce Concentrations of CO₂, SO₂ & NO₂". In 2015 with support and encouragement by Dr.A.Ramesh Sir, I was selected to teach the usage and applications of the total station in land surveying for the assistant executive engineers at Water and Land Management Training Research Institute (WALAMTARI), Hyderabad and achieved a teaching appreciation certificate present by the Govt. of Telangana. After the completion of my bachelor's degree in 2016, I tried to peruse higher studies to increase my knowledge of Environmental Engineering. I scored state 2nd rank in TS-PGCET in Environmental Management (EM)-2016 and also got admits from multiple universities in the USA. But I choose to get into the Master of Science in Environmental Engineering at Cleveland State University, Cleveland, Ohio. In my master's, I did my research on "Color Removal and Treatment of Dye and Sugar Wastewater Using Low-Cost Adsorbents". I published two research journal articles titled "Treatment of acid orange 74 wastewater and sugar wastewater by low-cost adsorbents", and "Treatment of Disperse Blue 14 Wastewater and Sugar Wastewater by Low-Cost Adsorbents" during my master's. In 2017, I & my team participated in a national level student design competition and secured first place in the competition in Ohio State, USA. I started applying to Ph.D. during the third semester of my master's and got fully funded admit from the University of Toledo. In 2018 May, I graduated with M.S. in Environmental Engineering degree from Cleveland State University. I started my Ph.D. immediately after masters. In my Ph.D., I got selected to work under two research grants (i) Radon Grant supported by the Ohio Department of Health (ODH) and (ii) Pollution Prevention Grant supported by the U.S. Environmental Protection Agency (USEPA) simultaneously as a research assistant. In 2018 August, I was offered to work as Handling Editor for Inderscience Publishers, Switzerland for two international Scopus Indexed journals named "International Journal of Environment and Waste Management" and "International Journal of Environmental Engineering". I was selected to present two conference papers titled "Examination of plant-based coagulants to replace lime and alum for

surface water treatment” and “Evaluation of Risk for Different Industrial Facilities using Toxic Release Inventory in Ohio” in the Air and Waste Management Association Annual Conference and Exhibition 2019 at Quebec City, Canada. In 2020 January, I got selected as channel manager intern for the “Solve Climate by 2030” project maintained by Bard Center for Environmental Policy. In 2020 June, I was among the selected 10,000 people all around the world for “The Climate Reality Project” led by the U.S. Ex-Vice President Al Gore. I am now a certified Climate Reality Leader. Even I faced hurdles in my life like any other student with Indian village background but now I can confidently say that I am halfway through to fulfill my dream. I sincerely thank all the faculty who have been always an inspiration and encouragement for my journey. Along with my technical/academic world, I never compromised in my personal life. I love traveling and am a good explorer. I covered 33 states in the USA during the past four years of my life journey. I would like to advise all my upcoming fellow engineers to utilize time properly to fulfill the dreams and never compromise to achieve anything. Please think and contribute to save the environment in any aspect which you can. Thank you for the opportunity to share my story.



Mr. Saisantosh Vamshi Harsha Madiraju receiving first prize in Ohio Water Environment Association student design competition held at Cleveland State University

Web GIS Architectures and Applications

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Introduction: Geographic Information Systems (GIS) has extensively been used by many academicians, students, scholars, industrialists, etc. in various applications since its invention in 1963 by Roger Tomlinson's pioneering work on plan and development of the Canada Geographic Information System. To continue his innovation of GIS, the Canadian government had commissioned Tomlinson to create a manageable inventory of its natural resources. Since then, the evolved GIS science crossed several milestones in making multiple thematic mapping to understand the world. For example, the well-known Environmental Systems Research Institute, Inc. (ESRI) is found by Jack Dangermond - a member of the Harvard Lab and his wife Laura in 1969. The consulting firm developed ArcGIS with application of computer mapping and spatial analysis to make decisions in various working fields. Today, GIS is being applied to solve real-world problems.

Connecting with World Wide Web (WWW) and Internet of Things (IOT), GIS is going through paradigm shift from developing static maps to dynamic maps helping clients in real-time need analysis and decision making in various sectors. This broad category of systems is referred to as Web Geographic Information Systems (Web GIS). These systems exhibit characteristics common to both stand-alone and web-based systems making it necessary to apply a hybrid methodology during their development (Fanon Ananda, et al, 2016). Web-based GIS Systems (Online GIS) are providing many capabilities for management and analysis of geographic data using technologies through the Internet. (Savvaidis Paraskevas, et al., 2005).

Definition: A 'Web GIS' can be defined as a distributed information system comprising mainly computer software and hardware (server) configuration that allows the sharing of maps, spatial data, and geographic processing operations to the clients within one's own network and beyond, using common Web communications protocols such as HTTP and Web Sockets through web browser, desktop application, or mobile application (Abdalla and Esmail, 2019 and ArcGIS, 2020). In simplest way, this can be defined as any GIS that uses web technology to communicate between a server and a client.

Advantages: 'Web GIS' has distinct advantages over traditional GIS such as: (i) entire world can access to Web GIS applications through computers or mobile devices, (ii) this can be used by millions of users simultaneously, (iii) multiple web browsers largely comply with HTML and JavaScript standards, Web GIS that relies on HTML clients will typically support different operating systems such as Microsoft Windows, Linux, and Apple Mac OS, (iv) it becomes cheaper as any organization can set up one Web GIS, and this single system can be shared by many users: from home, at work, or in the field, (v) Web GIS can be used by any audience who may not have knowledge of GIS, it is intended for a broad audience, (vi) for web GIS, one update works for all clients. This avoids the installation of updates by all clients and (vii) Web GIS can be used by everyone in an enterprise as well as the public at large (ArcGIS, 2020). Applications such as Public Participation GIS (PPGIS) methodology for national park planning, managing and promoting tourism resources, locating friends, and displaying Wi-Fi hot spots etc. are few examples.

Architectures:

(i) **Web GIS Architecture:** The growth of 'world wide web' has given concrete platform to the development of web GIS, as large and complex GIS applications become available to common public through the web. This integration facilitated the interactive access to geospatial data, real-time data integration and transmission etc., (Sonam Agrawal & R. D. Gupta, 2017).

In web GIS applications, web browser acts as a client for sending the request and a web server for responding to the request. The web server is used for non-spatial web applications and map servers are used for spatial data in web GIS applications, for example Web Map Service (WMS) and Web Feature Service (WFS). The client can make the request to the server located at any place using middleware technologies like Remote Procedure Calls (RPC) or Open Database Connectivity (ODBC). The web GIS architecture grows from multi-tier approach to plug-and-play to Service Oriented Architecture (SOA) (Yang et al. 2010) to cloud computing (Yang et al. 2011).

(ii) Client Server Architecture: Following the traditional network architecture, it has various approaches such as thin client, thick client, and hybrid architecture.

(a) Thin Client Architecture: In this architecture, client-side requirement of resources is minimum. When a client makes a request, the server generates a response, may be a map, which is a web-friendly file format that be rendered by the web browser. The Common Gateway Interface (CGI) is required as an interpreter between client and server. Another option available is the 'Java program' which is more efficient than CGI. Some other technologies are the Application Programming Interface (API), Active Server Pages (ASP), and Java Server Pages (JSP).

(b) Thick client architecture: In this architecture, the client is more powerful as the browser's capabilities are augmented by plug-ins, applets, etc. Plug-ins must be installed in advance on the client machine. It provides specialist viewing and manipulation functions on its native data type. Another option is the applet which is Java executable and does not require pre installation. The applet can make the most of visualization processing at the client side. Raw data provided from the server can be processed at the client side by various operations, e.g., it can be modified by filter process, filtered data can be mapped to some geometric representation, and this can be rendered using shading, lightening etc.

(c) Hybrid architecture: This is the combination of thin and thick client architectures. Some of the tasks that are related to data manipulation are performed at the server side while other tasks that are related to user interaction are dealt at the client side. It uses the combination of client and server-side technologies. Initially, this architecture was based on Applet-CGI combination, i.e., the applet is used at the client side while CGI at the server side. The applet-servlet evolved as more efficient option.

Web GIS Applications:

Web GIS applications are in various fields such as academic, research, business, decision making and development etc. Enlisting here few examples, the Y-Model Web GIS Development Methodology (YWDM) which has been adapted from existing software development methodologies and applied to the context of Web GIS development. Its viability as a methodology has been tested through its use in the implementation of the Emuhaya Web GIS portal (Fanon Ananda, et al, 2016). Greg Brown and Delene Weber (2011) presented the research to evaluate the use of a public participation geographic information system (PPGIS) methodology for national park planning. Visitor perceptions of park experiences, environmental impacts, and facility needs were collected via an internet-based mapping method for input into a national park planning decision support system. In relation to the assessment of earthquake damage to the built environment, and, to study action plans and strategies for the relief of population, the SEISIMPACT-THES System is a Web-based GIS System being developed for the organization into digital form and the evaluation of the records of reported damage in buildings connected to the occurrence of earthquakes. A pilot application for the damage of the buildings of Thessaloniki after the 1978 earthquake is also being done (Savvaidis Paraskevas, et al., 2005).

Joseph Mango et. al., (2020) designed web GIS model which provides an opportunity to manage and promote tourism resources for successful and sustainable tourism industry in Tanzania. The implemented model with dynamic and interactive maps for managing and promoting tourism resources using data collected is one of the largest contributors and fastest-growing economic sectors in many sub-Saharan Africa

countries. In another study by Cheng Qimin et al., (2012), a web GIS based vehicle monitoring system with typical three-tier application architecture of B/S pattern was developed. It provides ordinary registered users with a valid and convenient means to get access to real-time GPS location information of certain moving vehicles at any place, and further offers a powerful tool for super users to manage user information and remotely monitor those vehicles and provide corresponding services timely if necessary. Gilberto Farias de Sousa Filho, et al., (2019) have developed web GIS system meant to generate the matrix of real distances between clients and facilities. The Optimizer System is applied to the problem of locating collection zones and transmission (facilities), faced by the Brazilian electoral system to assist them in making decisions about the best locations for installing such facilities. It is intended to minimize the sum of the total distances traveled, and the maximum distance traveled by each client. The Digital Atlas for Schools is an innovative web GIS development contributing to the use of geospatial information in schools. Based on a story map tool, it creates a geography curriculum constructed on ArcGIS Online. Using this system, learners can acquire spatial thinking and geographical knowledge, develop responsible and active spatial citizenship. Both the secondary school students and geography teachers were benefited (Rafael De Miguel González & Maria Luisa De Lázaro Torres, 2020).

Concluding remarks:

There are various web GIS architectures, namely, client server, SOA, and cloud computing, etc. available. The selection of architecture depends on the considered problem. Thin client for client with minimum resources whereas thick client architecture is for client is powerful and has resources that can be used in processing at the client end. If the functions are available like web services, then SOA based webGIS architecture is a good option. Cloud computing is suitable when a software platform, or infrastructure is not available. There is a continuous change in the web GIS architecture to adapt the changing user needs and technological advancements. The focus nowadays is shifting towards peer-to-peer computing. With the evolution of Internet of Things (IoT), there is a need to perform certain level of computing at the edge of the network instead of transferring the entire computing capabilities towards cloud. Edge computing and fog computing are the emerging areas of research of the future.

References:

1. ArcGIS (2020). About web GIS. Webpage available at <https://enterprise.arcgis.com/en/server/latest/create-web-apps/windows/about-web-gis.htm>
2. Joseph Mango and Ebru Çolak & Xiang Li (2020). Web-based GIS for managing and promoting tourism in sub-Saharan Africa, *Current Issues in Tourism*, <https://doi.org/10.1080/13683500.2019.1711028>.
3. Sonam Agrawal1 & R. D. Gupta (2017). Web GIS and its architecture: a review. *Arabian Journal of Geosciences*, 10: 518.

Concrete 3D Printing

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1. Introduction:

We know that the construction industry almost runs with concrete from a recent study, form work is more attracting the total construction cost of concrete. Moreover, the conventional method of formwork limits the freedom of geometry and shape where only rectilinear forms are used limiting the architect's creativity and is highly costly. Another challenge facing is speed of construction, which is very slow due to a lot of steps, transportation, production etc. Then the main challenge comes i.e., laborer's who are required in a large number and there are huge risks while the whole process of construction.

There are many benefits of concrete 3D printing. It can be used to produce homes for people that lost their homes in an unfortunate natural disaster, create cheap homes for the homeless, and handle geometries that would be difficult for traditional construction techniques to handle. The list of possibilities goes on and on.

Aside from the low cost and high build speed, another benefit of concrete 3D printing is that nearly no material is wasted during the production process, making it more environmentally friendly than traditional techniques.

There's more to a house than four walls and a roof. There are other factors that are important to an inhabitant, such as thermal insulation. To deal with this, companies that specialize in concrete 3D printing are developing mixes of concrete which have a high thermal mass resulting in energy efficiency. Additionally, foam and other insulation materials can be integrated into the concrete walls if needed it more environmentally friendly than traditional techniques.

Concrete 3D printing is one of the additive manufacturing techniques (AM). Recently gaining popularity in construction industry. 3D printing is a group of emerging techniques for fabricating 3D structures directly with software in successive layers with less waste material. Initially AM technologies were developed in the 1980s. Currently, AM technologies become the main source of modern product development and successfully applied in a wide range of sectors including aerospace and automotive manufacturing, biomedical, consumer and food.

These technologies could create a new era of architecture that is better adapted to the environment and integrated with engineering function. Though many leading companies and universities are working on this technique throughout the world, the development of this process is not completely successful and can be said that it is still inadequate.

2. Concrete Printing Technology

Concrete is normally placed into formwork and then vibrated to fabricate building components.

Two alternative strategies have been developed to eliminate compaction process are

- 1) Self-compacting concrete
- 2) Sprayed concrete

These two processes have various advantages. But also, some disadvantages are there. Self-compacting concrete needs form work compulsory. Sprayed concrete needs higher cement content and shape to form of building components and sometimes precision is a problem. To avoid these disadvantages, we can go with the printing concrete.

Printing concrete has both the advantages of self-compacting and sprayed concrete. The main requirement of concrete printing process is extrudability and build ability. Extrudability was obtained by applying principles of self-compacting concrete and sprayed concrete i.e extrudability indirectly related to the workability of concrete. Build ability also depends on workability and mix proportions and in particular variation in workability with time. These can be achieved with concrete printing.

2.1. Additive Manufacturing (A.M) Techniques in Construction Industry are

- i) Extrusion based 3Dprinting
 - a) Frame based system
 - b) Robotic arm-based system
- ii) Binder jetting system.

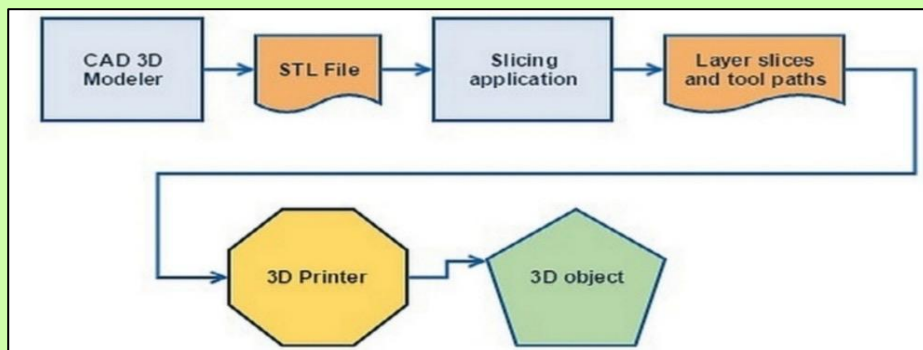


Fig 1: Process of printing

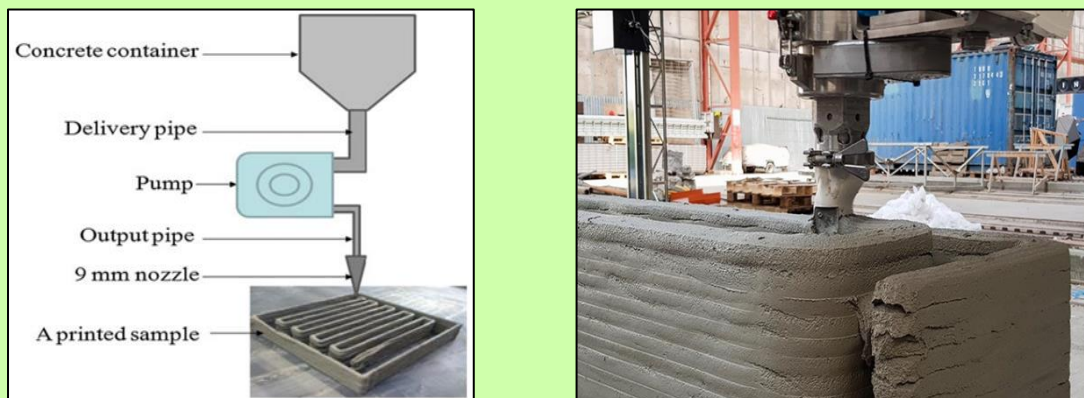


Figure 2: Schematic Concrete Delivery System

2.2 Advantages of Concrete printing:

- Time efficient.
- Massive Labour requirement decreases.
- Upcoming future technology.
- Freedom of building any geometrical design.
- Environmentally friendly construction.
- Economical about 30-40% of construction cost is towards form work.
- Reducing the injuries on site.

2.3. Disadvantages of Concrete printing:

- Accuracy
- Ambiguity in strength and performance.
- Need less but skilled labour.
- A small mistake can destroy the whole structure.

2.4 Challenges in 3D printing of concrete:

- Obtaining Robust and stable mixtures
- 3D Printable mixtures with Coarse Aggregates
- Reinforced printable concrete.

2.5 Modelling:

- Developing Viscoelastic models to predict the deformations of layers.
- Rheological models to predict build up due to thixotropy and heat of hydration

3.0 Images of concrete printed structures



Fig 3: The 3D Model



Fig 4: The world's largest 3D-printed building-Dubai

Conclusions: Concrete 3D printing technology is a promising technology for the future.

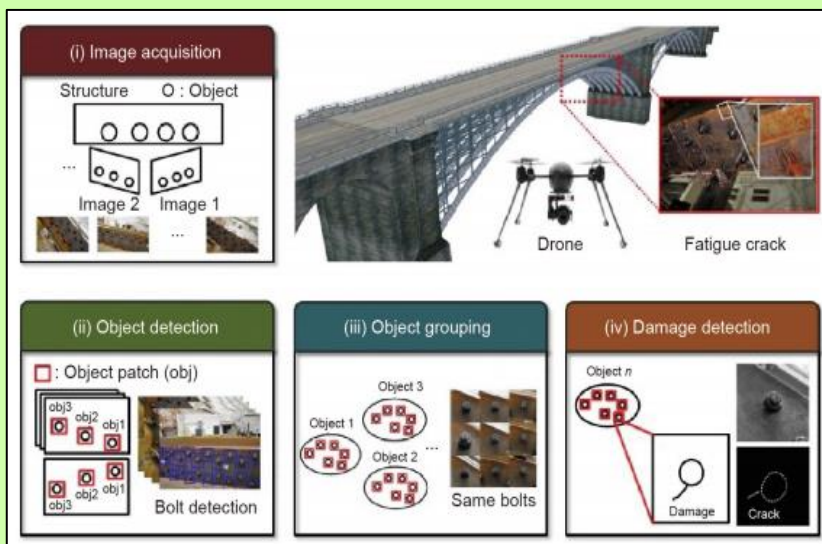
References:

Various internet sources are acknowledged

Generative Adversarial Networks: Future Applications and Impact in the Construction Industry

Vishal Singh
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The construction industry is known to be overwhelmed with resource planning, risk management and logistic challenges which often result in design defects, project delivery delays, cost overruns and contractual disputes. These challenges have instigated research in the application of advanced machine learning algorithms such as deep learning to help with diagnostic and prescriptive analysis of causes and preventive measures. However, the publicity created by tech firms like Google, Facebook and Amazon about Artificial Intelligence and applications to unstructured data is not the end of the field. There abound many applications of deep learning, particularly within the construction sector in areas such as site planning and management, health and safety and construction cost prediction, which are yet to be explored. The overall aim here is to review existing studies that have applied deep learning to prevalent construction challenges like structural health monitoring,

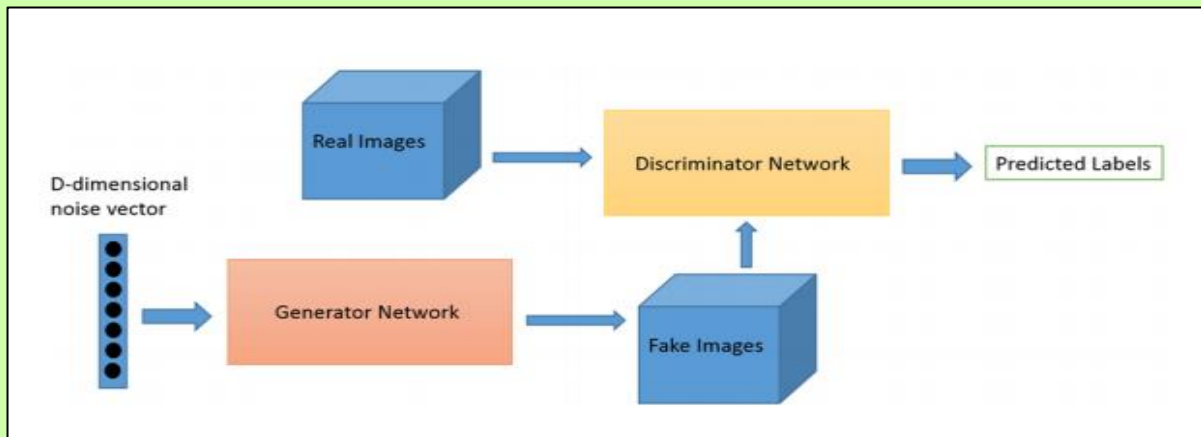


construction site safety, building occupancy modelling and energy demand prediction. To the best of our knowledge, there is currently no extensive survey of the applications of deep learning techniques within the construction industry and hopefully inspire future research into how best to apply image processing, computer vision, natural language processing techniques of deep learning to numerous challenges in the industry.

What are GANs?

Generative Adversarial Networks (GANs) have become a hot research topic recently, mostly described as the most interesting idea in the last 10 years in machine learning. Firstly, Goodfellow introduced the adversarial process to learn generative models. The fundamental aspect of GAN is the min-max two-person zero-sum game. In this game, one player takes the advantages at the equivalent loss of the other player. Here, the players correspond to different networks of GAN called discriminator and generator. The main objective of the discriminator consists of determining whether a sample belongs to a fake distribution or real distribution. Whereas generator aims to deceive the discriminator by generating fake sample distribution. Discriminator produces the chances or probability of a given sample to be a real sample. A higher value of probability shows that the sample is likely to be a real sample. The value close to zero indicates that the sample is a fake sample. The probability value near 0.5 indicates the generation of an optimal solution, such that discriminator is unable

to differentiate fake and real sample. The general architecture of GAN is shown. In general architecture, a generative adversarial network has two types of networks called discriminator and generator denoted as D and G respectively.

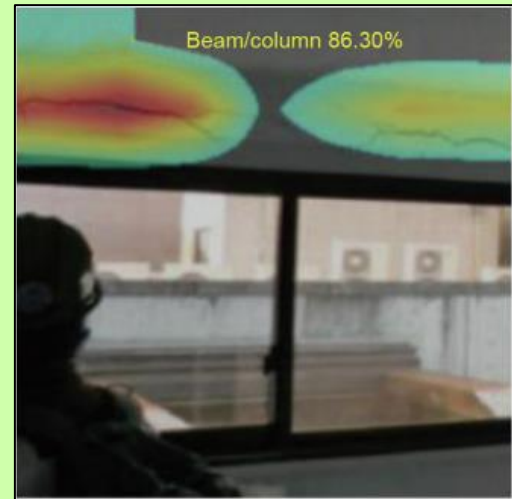
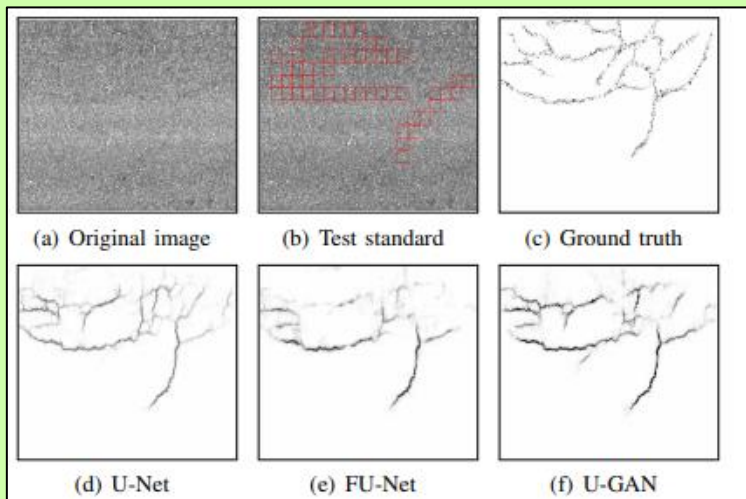


In general, deep learning requires many thousands of training data per category to achieve sufficient accuracy. However, in real-world civil engineering projects, it is often difficult to collect such high-quality labelled large-scale data. This is because the differences in the environment result in varied types of deterioration and the degrees of damage progress for each structure. Further, the more serious the damage, the more difficult it is to collect data. For example, for road damage, potholes are repaired as soon as they are discovered given their serious effect. Therefore, it is difficult to collect pothole images. But constant trials have led us to few but more accurate applications such as Generative Adversarial Networks for Road Crack Image Segmentation, Generative adversarial network for road damage detection, Generative Adversarial Network Model for Simulating Various Types of Human-Induced Loads on a structure, Concrete spalling, Fatigue cracks in steel, Asphalt defect, Conversion of blurry images of cracks or other such instances where a lot of data is lost can be successfully converted into high resolution sharp images by use of GAN as shown in the image below.

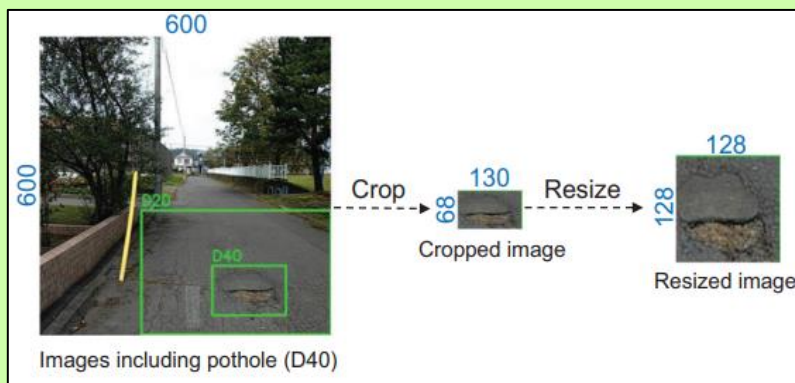


As mostly in case of lost data interpolation using available data is done which leads to higher percentage of errors, this can be successfully tackled by use of GANs in various sectors such as Water Resources, Geotechnical, Surveying, Video Monitoring in case of Structural Health Monitoring etc. In such cases, data augmentation based on a generative adversarial network (GAN) can increase the performance considerably. Since the generated images are realistic but are completely new samples, they are expected to fill the real image distribution not covered by the original dataset with least number of errors. Many studies have reported improved image classification accuracy using

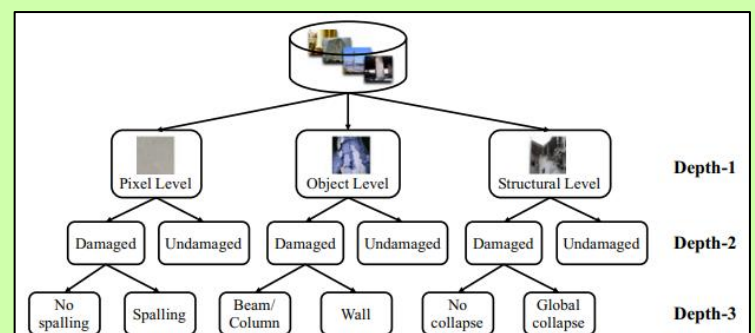
GAN. Real cracks vs Fake crack detection can be done easily with high accuracy by use of GANs as shown below.



Potholes that usually the major contributors to road damage. Similar research is being carried out in order to enhance the pothole detection accuracy by use of GANs. But in certain situation such as potholes present in the shadow (as shown below) or under immense light, GANs can be trained effectively to identify these anomalies accurately.

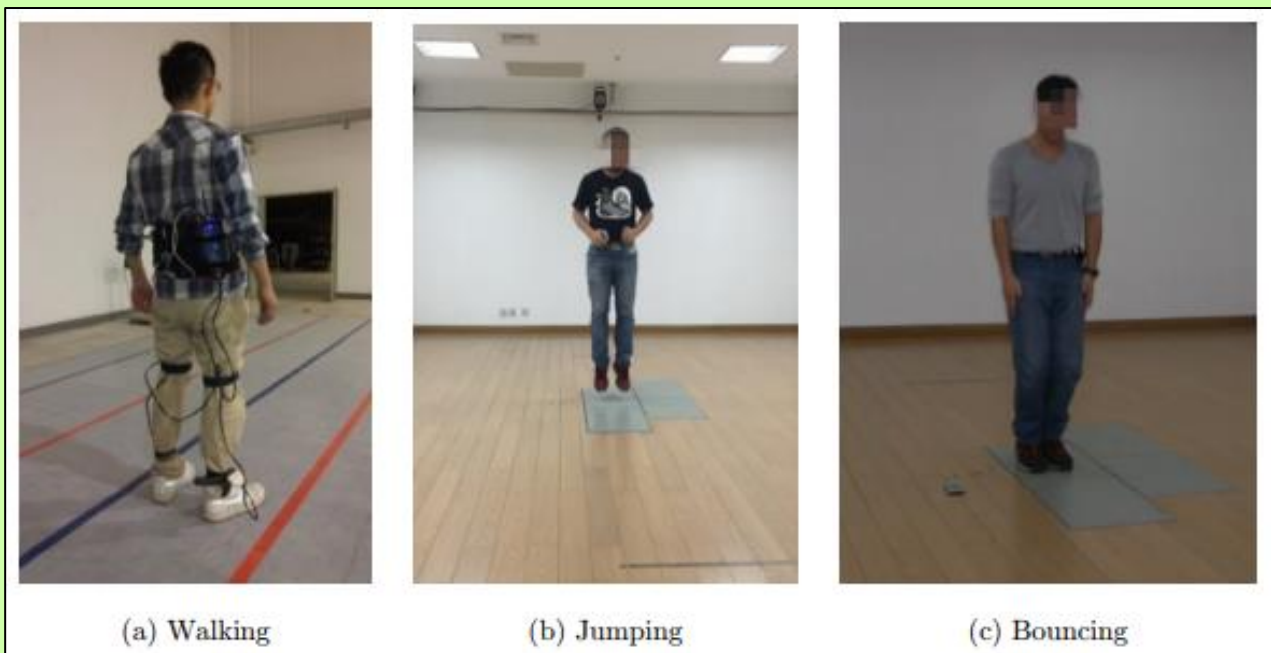


GAN is introduced in vision based SHM, where two major detection tasks (scene level identification and damage state check) were checked. Due to the complex distribution of structural images, common schema of GAN training did not work well and only resulted in some mixed synthetic images with just basic classification of data with very less accuracy. major drawback of applying current GANs here in damage classification, is that generated synthetic data fully depends on optimization by minimizing the distribution difference with the real data, which may not fully comply with the physics of the problem at hand. Thus, future studies should consider encoding physics principles and information



into the GAN model formulation. These modules are currently being tested to increase the accuracy and yield better results for accurate damage detection on large data sets.

Further research was carried out by using several input parameters by taking various loads of human loads such as walking, running, jumping, bouncing whose accuracy and damage prediction was done in real time using GANs. The generated load samples were found to having similar waveforms, structure response prediction results to real samples. GAN model has proven to be a new and promising way to develop a unified simulation approach for all types of human-induced loads. Moreover, the load simulation procedure suggested can be directly applied for other dynamic excitations such as earthquake and wind load in the future.



IMPACTS OF CLIMATE CHANGE

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Climate change refers to the change in the environmental conditions of the earth, due to many internal and external factors. The climatic change has become a global concern over the last few decades; besides, these climatic changes affect life on the earth in various ways. These climatic changes have caused various impacts on the ecosystem and ecology as well as on the human lives and properties. Impacts of Climate Change is an updated article on the issue of abrupt climate change and its impacts that have the potential to severely affect the physical climate system, natural systems, or human systems, often affecting multiple interconnected areas of concern. In addition to above, it also gives information about the seriousness of this threat with tipping points to better anticipate and prepare ourselves for the inevitable surprises.

Effects of climate change in India

Climate change has had extreme impacts in India. Extreme changes in the weather and environment can increase existing health problems, as well as creating new ones. A rise in average global temperatures have led to a worrying trend of no rain for long periods, a sudden bout of excessive rainfall, causing extreme weather events, particularly floods which took lives, destroyed homes and agricultural yields as well as resulted in huge revenue losses. An increase in frequency of extreme events such as storms, floods, droughts, and cyclone directly affect the human health in terms of loss of life and injury (physical injuries and post-traumatic stress disorders) and affects indirectly through loss of houses; population displacement; contamination of water supplies; loss of food production; increased risk of epidemics of infectious diseases and damage to infrastructure for provision of health services.

The three major impacts caused due to climate change specifically in India are pointed below:

- **Health effects of extreme temperatures:**

Extremes of temperature can kill. While Himachal Pradesh and Uttaranchal experienced a cold wave, other parts in the country were subjected to heat wave. In 1998, the heat wave in Orissa was recorded as one of the worst, claiming more than 2000 lives. Andhra Pradesh reeled under heat wave in 2003, killing 1421 people, which is an all-time high in the history of Andhra Pradesh.

- **Health effects of extreme weather events:**

Extreme weather events such as severe storms, floods, and drought have claimed thousands of lives during the last few years and have adversely affected the lives of millions. India and the subcontinent saw five of the 20 major natural calamities recorded worldwide in terms of victims. Orissa is no stranger to cyclones, but the 1999 cyclone was unprecedented for the sheer severity, leaving nearly 10,000 dead and has gone down in history as the Super cyclone. In 2003, floods claimed thousands of lives and rendered millions of

people homeless in Assam, Bihar, West Bengal, Orissa, Uttar Pradesh, Himachal Pradesh, Rajasthan, and Gujarat.

Health effects of more variable precipitation patterns:

The Indian metropolitan city of Mumbai was besieged with India's heaviest downpour of the century in July 2005, killing nearly 600 people. According to the Indian Meteorological department, it was the heaviest ever rainfall received in a single day anywhere in India, recorded at 94.4 cm in the last 100 years. On the other hand, Cherrapunji in the northeastern state of Meghalaya, generally well known for being the wettest place in the world, is going through a rare rain crisis and is experiencing dry spells.

Few other significant impacts caused due to Climate Change are explained below:

Melting of Glaciers:

Glaciers in the north-western Himalayas and in the Karakoram range - where westerly winter winds are the major source of moisture - have remained stable or even advanced. Most Himalayan glaciers where a substantial part of the moisture is supplied by the summer monsoon, have been retreating over the past century. At 2.5°C warming, melting glaciers and the loss of snow cover over the Himalayas are expected to threaten the stability and reliability of northern India's primarily glacier-fed rivers, particularly the Indus and the Brahmaputra. Alterations in the flows of the Indus, Ganges, and Brahmaputra rivers could significantly impact irrigation, affecting the amount of food that can be produced in their basins as well as the livelihoods of millions of people (209 million in the Indus basin, 478 million in the Ganges basin, and 62 million in the Brahmaputra basin in the year 2005).

Sea Level Rise:

Mumbai has the world's largest population exposed to coastal flooding, with large parts of the city built on reclaimed land, below the high-tide mark. With the increase in global temperatures associated with rapid and unplanned urbanization further increases the risks of sea water intrusion. Sea-level rise and storm surges would lead to saltwater intrusion in the coastal areas (Kolkata and Mumbai), impacting agriculture, degrading groundwater quality, contaminating drinking water, and possibly causing a rise in diarrhea cases and cholera outbreaks, as the cholera bacterium survives longer in saline water.

Water Scarcity:

Many parts of India are already experiencing water stress. Even without climate change, satisfying future demand for water will be a major challenge. An increase in variability of monsoon rainfall is expected to increase water shortages in some areas. Studies have found that the threat to water security is very high over central India, along the mountain ranges of the Western Ghats, and in India's north-eastern states.

Energy Security:

Climate-related impacts on water resources can undermine the two dominant forms of power generation in India - hydropower and thermal power. To function at full efficiency, thermal power plants need a constant

supply of fresh cool water to maintain their cooling systems. The increasing variability and long-term decreases in river flows can pose a major challenge to hydropower plants.

Protecting health from climate change:

In late 2015, to address climate change, more than 190 countries including India approved Paris Agreement at the 21st session of the Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) in Paris. In the agreement, all countries agreed to work to limit global temperature rise to well below 2 degrees Celsius and to make best efforts to keep it to 1.5 degrees Celsius, for the achievement of the Sustainable Development Goals. India laid strong foundations for greater global cooperation on climate action through its pledge for the Paris Agreement. India has committed to cut its emission intensity of gross domestic product (GDP) by 33-35% of 2005 levels by 2030. Promotion of renewable energy by the Indian government is a strong commitment to climate change.

Conclusion:

The future of climate change action is a future of enormous diversity implicating every sector and discipline, states, and non-state actors. It is also a future of great opportunity in a multitude of potential solutions, so it is on our responsibility that we come together as a whole and contribute towards a sustainable environment eradicating the climate change problem.

References:

1. Climate impacts- "<https://www.un.org/sustainabledevelopment/climate-change/>"
2. Climate change impacts in India- "<https://theyearsproject.com/learn/news/how-climate-change-is-hitting-india/>"
3. Introduction to climate change- "<https://www.teriin.org/climate>"
4. Now is the time for change- "<https://unfccc.int/climate-action/momentum-for-change>"
5. Heat waves in India data- "<https://earthobservatory.nasa.gov/images/145167/heatwave-in-india>"
6. Floods report in India- "<https://www.bbc.com/news/world-asia-india-45243868>"



It's a great profession. The fascination of watching the imagination emerge through aid of science to a plan on paper. Then it is realized in stone. Later it brings jobs, elevates the standards of living and adds to the comforts of life. That's the engineer's high privilege.

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