News Letter - 19

January to June 2019

Civil Quest

Department of Civil Engineering

SR Engineering College

Ananthasagar (V), Hasanparthy (M), Warangal 506371

Vision

To be a leader in developing competent Civil Engineers.

Mission

- Build Civil Engineering knowledge in students by implementing novel educational strategies
- Develop effective instructional infrastructural resources.
- Promote interdisciplinary learning
- Contribute to the growth of Civil Engineering through community service, consultancy and research

Program Educational Objectives (PEO's)

PEOs (Program Educational Objectives) relate to the career and professional accomplishments of students after they graduate from the program. The Civil Engineering graduates from S R Engineering College, Warangal are expected to

- **Build knowledge and skill** set required for solving Civil Engineering problems
- **Create innovative technical ventures** in Civil Engineering.
- **Promote Research and consultancy activities** to solve Real world Civil Engineering problems.

Program Outcomes (PO's)

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSO's)

- Apply knowledge of mathematics, science and engineering to analyze, design and execute the Civil Engineering structures for the betterment of the society and the nation.
- Acquire the knowledge about various techniques, skills and modern Engineering tools required for the construction of Civil Engineering structures.

Publications

1. Abdy Sayyed, M. A. H., Gupta, R., & Tanyimboh, T. (2019). Combined flow and pressure deficit-based penalty in GA for optimal design of water distribution network. ISH Journal of Hydraulic Engineering, 27(sup1), 146-156.

2. Krishna, A. S., & Rao, V. R. (2019). Strength prediction of geopolymer concrete using ANN. International Journal of Recent Technology and Engineering (IJRTE), 7(6C2), 661-667.

3. Banu, S. T., Chitra, G., Awoyera, P. O., & Gobinath, R. (2019). Structural retrofitting of corroded fly ash based concrete beams with fibres to improve bending characteristics. Australian Journal of Structural Engineering, 20(3), 198-203.

4. Venkatreddy, P., Krishna, A. S., & Yadav, G. S. (2019). Experimental Investigation on RCC by Using Multiple Admixtures. International Journal of Engineering & Technology, 7(3.3), 14-16..

5. Gobinath, R., Akinwumi, I. I., Afolayan, O. D., Karthikeyan, S., Manojkumar, M., Gowtham, S., & Manikandan, A. (2029). Banana fibre-reinforcement of a soil stabilized with sodium silicate. Silicon, 12(2), 357-363.

6. Gopikrishna, M., & Priyanka, A. (2019). Strength and durability enhancement of soft soil by using mineral admixtures-A study on effect in soil fabric. Int. J. Recent Technol. Eng., 8(1), 2959-2963.

7. Krishna, A. S., & Rao, V. R. (2019). Strength prediction of geopolymer concrete using FUZZY. Int J Recent Technol Eng, 7, 668-671.

8. Gopikrishna, M., & Priyanka, A. (2019). Strength and durability enhancement of soft soil by using mineral admixtures-A study on effect in soil fabric. Int. J. Recent Technol. Eng., 8(1), 2959-2963

9. Rajesh Kumar, K., Ramamohan, R., & Murthi, P. (2019). Shear Resistance of portal Frame Reinforced with Bamboo and Steel Rebar': Experimental and Numerical Evaluation. Int. J. Recent Technol. Eng, 8, 445-52.

Combined flow and pressure deficit-based penalty in GA for optimal design of water distribution network

Abstract: The optimal design of water distribution networks involves minimizing the cost of the network subject to the constraints of satisfying the pressure requirements at all the nodes. In genetic algorithm (GA)-based optimal design, such constrained problems are generally converted to unconstrained ones using penalty methods. The penalty is applied for not meeting the pressure constraints. Researchers observed previously that the optimal solutions lie on the boundary of feasible and infeasible solutions. They suggested self-organizing penalty based on pressure heads for increasing the computational efficiency and obtaining better solutions. Usually, a flow-dependent analysis is carried out to obtain pressure deficiency at different nodes with the assumption that all nodal demands are satisfied. The assumption of demand satisfaction at all nodes for infeasible solutions results in higher pressure deficiency at different nodes, resulting in higher penalty costs than actually required. This may delay the convergence. Herein, a novel flow-based penalty approach is suggested in which the penalty is obtained based on the shortfalls in the pressures and flows at different nodes using pressure-dependent analysis. The methodology is illustrated with results from benchmark networks. The modified GA method is found to be converging faster as compared to other methods of penalty application.

Keywords: *Water distribution networks, Genetic algorithm, Penalty-based GA, Pressure-dependent analysis,*

Citation: Abbas., et al 2019, ISH Journal of Hydraulic Engineering, doi:10.1080/09715010.2019.1604180

Structural retrofitting of corroded fly ash based concrete beams with fibres to improve bending characteristics

Abstract: Generally, it is known that concrete and its embedded steel reinforcement progressively deteriorate when exposed to aggressive environments, yet when this defect deepens it leaves the concrete structure in unserviceable state. Therefore, the current study aims to evaluate the bending characteristics of corroded fly ash based fibre retrofitted concrete beams. Thus, the study attempts to measure the corrosion inhibition characteristics of fibre retrofitted reinforced concrete beams. Aside beams produced with conventional materials, other beams were produced with fly ash fixed at 30% replacement of Ordinary Portland Cement. Beams were cured in water for up to 34 days before they were induced in simulated corrosive environment. Some corroded beams were retrofitted with basalt fibre and others with sisal fibre, before being subjected to bending test. Despite the evident deterioration resulting from corrosion, the results clearly indicated that the fibres provided additional strengths to the corroded beams, with basalt fibre producing better response to loading at about 18% capacity than control beam before failure. Basalt fibre has been found to enhance the structural bending capacity of corroded member..

Keywords: *Corrosion, fly ash, basalt fibre, sisal fibre, bending test, retro fitting*

Citation: Poongodi K., et al 2018, International Conference on Intelligent Computing and Communication for Smart World, doi: 10.1109/I2C2SW45816.2018.8997421

Banana Fibre-Reinforcement of a Soil Stabilized with Sodium Silicate

Abstract: Many unsuitable soils for construction purposes can be made suitable by using unconventional soil stabilizers. This study investigates the effects of banana fibre-reinforcement of a soil stabilized with sodium silicate on the geotechnical properties of the composite. It involved the application of 1% sodium silicate with varying proportion (0.1, 0.2, 0.3, 0.4 and 0.5%) of banana fibre to a gravelly sand. Index properties, unconfined compression, direct shear, split-tensile and California bearing ratio (CBR) tests were determined for the stabilized soil and the reinforced soil samples. The results show that the plasticity index, unconfined compressive strength (UCS), shear strength, split-tensile strength and CBR of the specimens stabilized with sodium silicate increased with increasing percentage of banana fibre content. The application of 0.5% banana fibre strengthened the soil - the UCS increased by 445%, shear strength by 80%, split tensile strength by 194% and the soaked CBR increased by 1083%. The banana fibre-reinforcement of the sodium silicate stabilized sandy soils made the stabilized soil become suitable for road pavement application as sub-base material.

Keywords: *Foundation . Geotechnics . Materials . Soil improvement . Waste management*

Citation: Gobinath, et al 2019, Silicon,. https://doi.org/10.1007/s12633-019-00124-6

Shear Resistance of portal Frame Reinforced with Bamboo and Steel Rebar: Experimental and Numerical Evaluation

Abstract: The main objective of this study is to evaluate the shear resistance of portal frame fabricated with bamboo and steel rebar by following experimental and numerical approaches. In support of sustainable construction, bamboo stripes were utilized as a partial replacement of steel rebar at tension zone of members that are subjected to lateral loading. The performance of nominal portal frame, which are fabricated with steel reinforcement was compared to the portal frames having several replacements of steel reinforcement with bamboo, in terms of seismic resistance and lateral load capacity. The experimental data was correlated based on software analysis using ABAQUS. The partial replacement of steel with bamboo under tension zone of the beams in portal frame was found to be highly effective, and also that the flexural rigidity of the partial bamboo reinforced frame was slightly higher than the nominal portal frame. This study provides insight on the possibility of reinforcing structural members with bamboo, when lateral loading is imminent on the structure.

Keywords: *ABAQUS, Bamboo, steel, Seismic failure, Shear resistance.*

Citation: Rajesh., et al 2019, Int. J. Recent Technol. Eng, 8, 445-52. ISSN: 2277-3878

Departmental & Student Activities

1. Four Day National Webinar on "Sustainable Materials Development & Marketing Strategies for Urban India", between 16th and 19th June, Organized by Department of Civil Engineering, SREC, Warangal.

2. One week Software Training Camp on "ArcGIS & ERDAS Imagine", between 13th and 18th May 2019, Organized by Dept of Civil Engineering, SREC, Warangal

3. One week Software Training Camp on "STAAD.Pro", between 13th and 18th May 2019, Organized by Dept of Civil Engineering, SREC, Warangal

4. Seminar on "Career Opportunities for Civil Engineers", on 2nd February 2019, Organized by Dept of Civil Engineering, SREC, Warangal

5. One Day Seminar on "Application of White Cement and Decorative Materials in Building Construction", on 25th January 2019, Organized by Dept of Civil Engineering, SREC, Warangal

6. One Day Workshop on "Recent Development in Special Structural Concretes", on 5th January 2019, Organized by Dept of Civil Engineering, SREC, Warangal

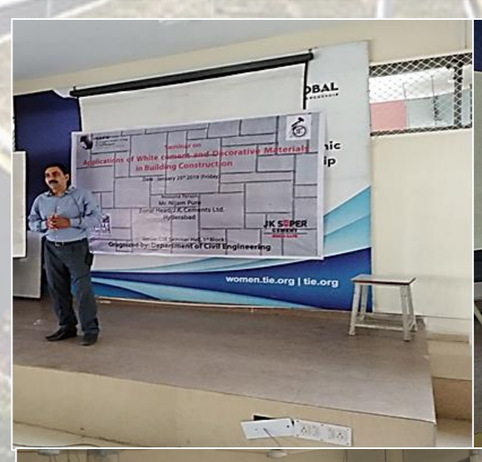
7. One Day Seminar on "Future of Hydro Informatics for Managing Water", on 4th January 2019, Organized by Dept of Civil Engineering, SREC, Warangal

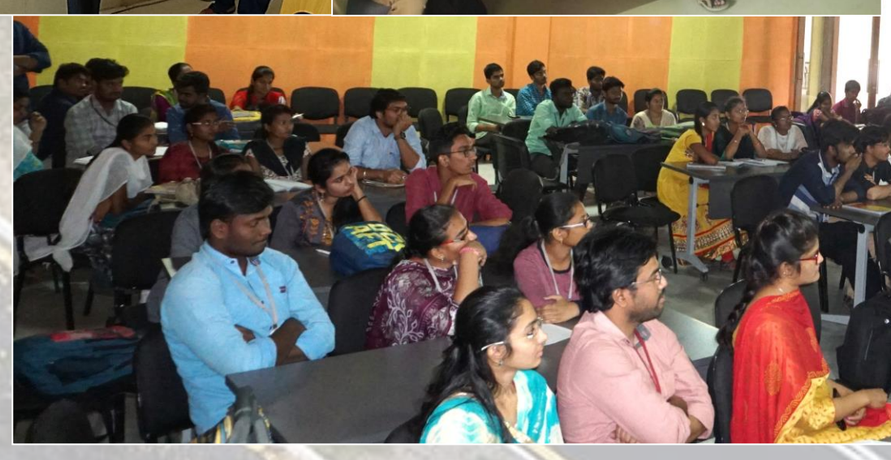
8. Two Days Workshop on "Entrepreneurship for Civil Engineer", between 2nd and 3rd January 2019, Organized by Dept of Civil Engineering, SREC, Warangal

9. Revanth, V., Vinay Raj, T., Rakesh, G., Bhavani., participated at "International Conference on Mechanical and Building Sciences - ICMBS- 2019", between 27th and 28th March 2019, Organized by SNS College of Technology, Coimbatore

10. Final Year Students (97) participated and presented their work at "3rd National Conference on Recent Innovation in Civil Engineering and Technology (RICET-19)", on 16th March 2019, Organized by JCT College of Engineering & Technology, Coimbatore.

Inter Departmental Sports Competitions Phase-2, between 13th December 2018 to 29th February 2019, Students from Civil Engineering outperformed and were declared winners in Kabaddi, Kho-Kho, Football and Runner up in Volley Ball.





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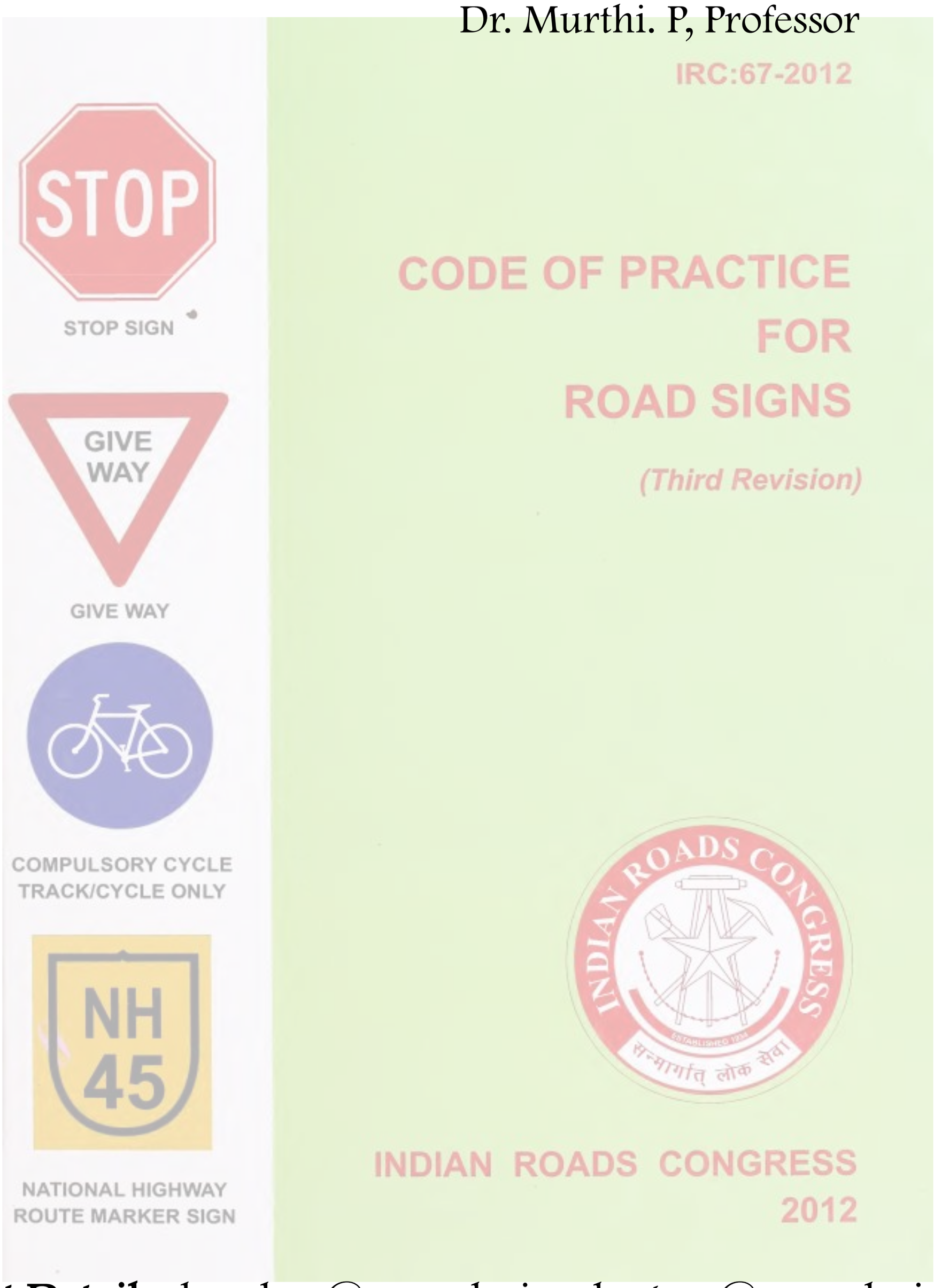
Editorial Board:

Dr. Vinay. S, Assistant Professor

Dr. Murthi. P, Professor



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