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STRUCTURAL HEALTH MONITORING USING IOT

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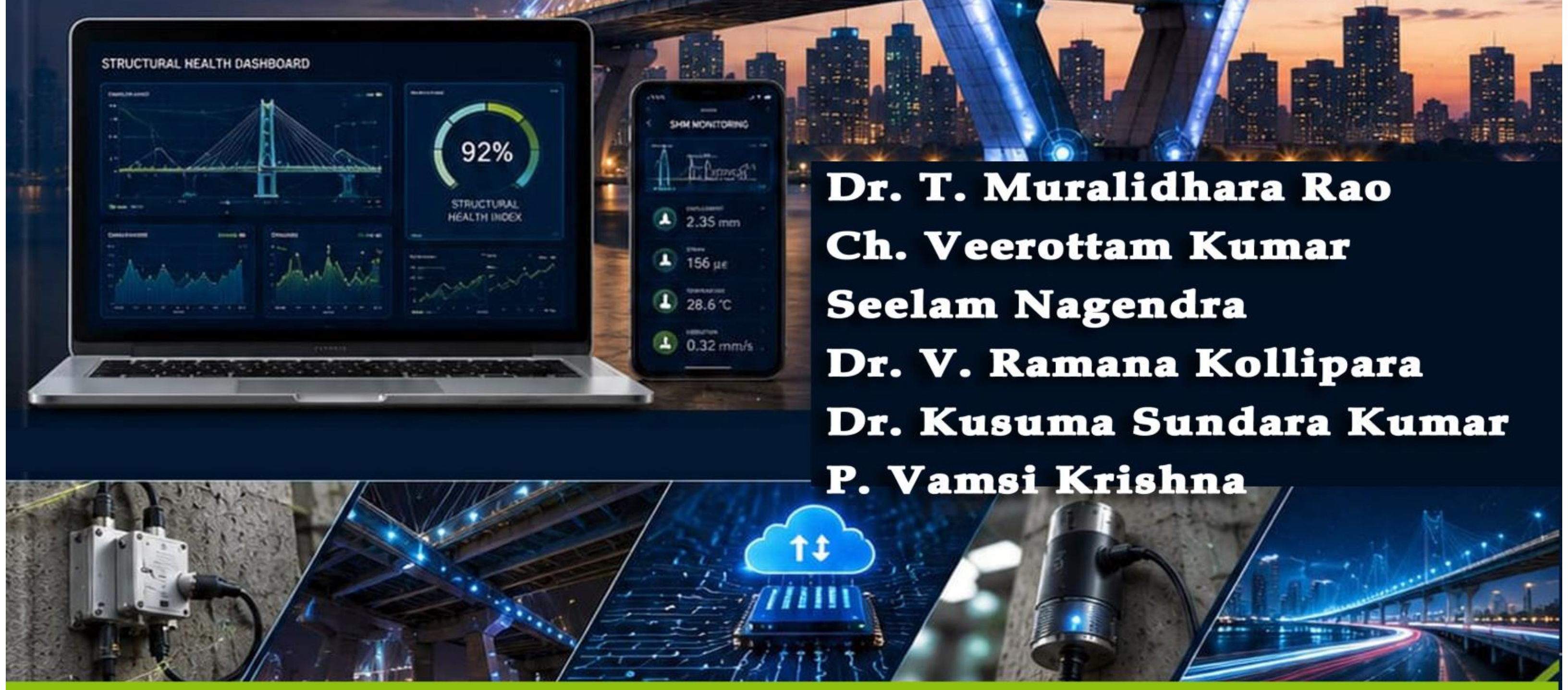

Dr. T. Muralidhara Rao
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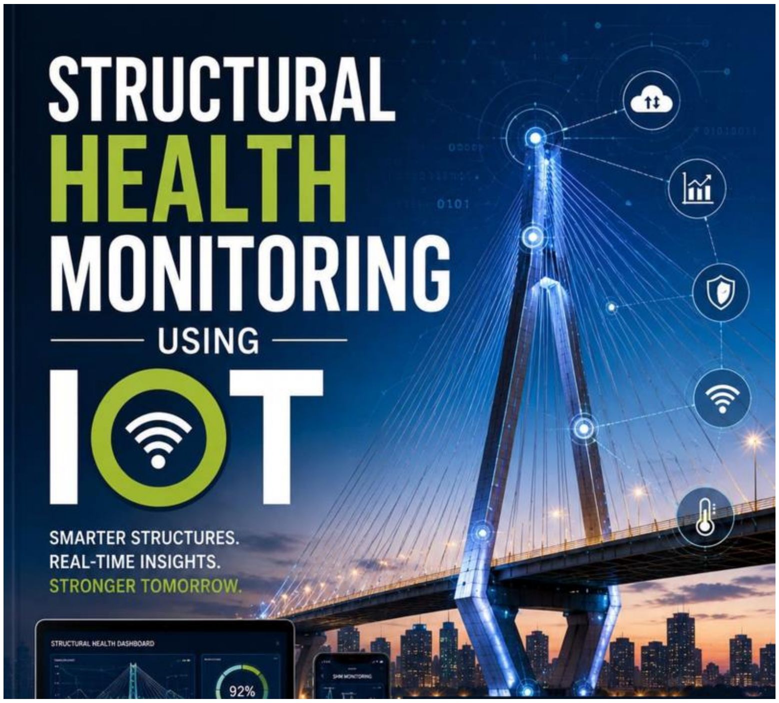

1. **Dr. T. Muralidhara Rao**
   Professor, Department of Civil Engineering,
   CVR College of Engineering, Hyderabad, Telangana, India

2. **Ch. Veerottam Kumar**
   Associate Professor, Department of Civil Engineering,
   Ramachandra College of Engineering (A), Eluru, Andhra Pradesh, India

3. **Seelam Nagendra**
   Assistant Professor, Department of Computer Science & Engineering,
   Aditya University, Surampalem, Andhra Pradesh, India

4. **Dr. V. Ramana Kollipara**
   Professor and Head, Department of Civil Engineering,
   Lakireddy Balireddy College of Engineering (A), Mylavaram, Andhra Pradesh, India

5. **Dr. Kusuma Sundara Kumar**
   Professor & HoD, Department of Civil Engineering
   Ramachandra College of Engineering (A), Eluru, Andhra Pradesh, India, India

6. **P. Vamsi Krishna**
   Assistant Professor, Department of Civil Engineering,
   SRK Institute of Technology, Enikepadu, Vijayawada, Andhra Pradesh, India

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Author(s) : **Dr. T. Muralidhara Rao**
Ch. Veerottam Kumar
Seelam Nagendra
Dr. V. Ramana Kollipara
Dr. Kusuma Sundara Kumar
P. Vamsi Krishna

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Cell +91-9842641794
excellentpublishers2013@gmail.com
www.excellentpublishers.com

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PREFACE

Dear Reader,

Urban flooding has become a serious and recurring challenge in rapidly developing cities. Rapid urbanization, increasing impervious surfaces, inadequate drainage infrastructure, encroachment of natural drainage systems, poor maintenance, and changing rainfall patterns have considerably increased urban flood risk. The impacts extend beyond temporary waterlogging, affecting human life, infrastructure, transportation, public health, economic activities, and the overall sustainability of cities. This book, *Urban Flood Mitigation*, has been prepared to provide a systematic understanding of the causes, assessment, management, and mitigation of urban flooding. It presents urban flooding as a multidisciplinary challenge requiring the integration of engineering, hydrology, urban planning, environmental management, geospatial technologies, disaster management, institutional coordination, and community participation.

The book discusses the fundamentals of urban flooding and storm water management, followed by urban drainage systems, sustainable storm water management, flood-risk assessment, Sustainable Urban Drainage Systems (SUDS), urban storm water planning, and structural and non-structural mitigation measures. Particular emphasis is placed on sustainable and nature-based approaches that promote infiltration, storage, controlled release, and reuse of storm water rather than relying solely on rapid conveyance. The book also examines the growing influence of climate change on urban flooding, including intense rainfall events, changing precipitation patterns, sea-level rise, and associated challenges to existing drainage systems. It highlights the importance of integrated, catchment-based, sustainable, and climate-resilient planning approaches for developing cities.

An important feature of this work is its coverage of GIS, Remote Sensing, flood modelling, monitoring, forecasting, early warning systems, disaster preparedness, governance, and community participation. These tools and approaches can support better flood-risk assessment, planning, decision-making, and emergency response. The book also recognizes that effective mitigation requires a balanced combination of structural, non-structural, sustainable, and institutional measures. The book is intended for undergraduate and postgraduate students, researchers, civil and environmental engineers, urban planners, water-resources professionals, municipal authorities, disaster-management practitioners, and policymakers. The presentation is designed to support both academic learning and practical understanding, with appropriate review questions and objective-type questions included for educational use.

The central philosophy of this book is that urban flooding should not be addressed merely by attempting to remove storm water as quickly as possible. Instead, cities must learn to manage storm water sustainably, work with natural hydrological processes, reduce vulnerability, protect natural drainage systems, and build long-term resilience.

It is hoped that this book will serve as a useful academic and professional reference and contribute to the development of safer, sustainable, climate-resilient, and flood-resilient cities.

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Ch. Veerottam Kumar
Seelam Nagendra
Dr. V. Ramana Kollipara
Dr. Kusuma Sundara Kumar
P. Vamsi Krishna

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About the Authors

Dr. T. Muralidhara Rao is Professor in the Department of Civil Engineering at CVR College of Engineering, Hyderabad. He holds a Ph.D. from NIT Warangal and has over 30 years of experience in teaching, research, administration, and consultancy. His expertise includes Structural Modelling, Behavioural Analysis, Fracture Mechanics, and Sustainable Construction Materials. He has published over 50 research papers, holds three patents, serves as a Ph.D. supervisor, and is a Fellow of the Institution of Engineers (India).

Mr. Ch,Veerottam Kumar: Associate Professor at Ramachandra College of Engineering in Civil Engineering, Eluru, with a MTech (Ph.D.) in Civil Engineering and 15 years of experience, He holds a B. Tech from A.N.U, M. Tech from JNTUH and Perusing Ph.D. in KIT Bhubaneswar he specializes in Structural Engineering with Industrial Experience in Civil Engineering.

Mr. Seelam Nagendra is an Assistant Professor in the Department of Computer Science & Engineering at Aditya University, Surampalem, Andhra Pradesh. He brings 8 years of teaching experience and holds a unique, interdisciplinary academic foundation, featuring a B.Tech in Civil Engineering from JNTUA alongside dual M.Tech degrees in Structural Engineering and Computer Science & Engineering from JNTU-Kakinada. An active researcher, he has published five papers in peer-reviewed, UGC-indexed journals.

Dr. V. Ramana Kollipara is Professor and Head of the Department of Civil Engineering at Lakireddy Balireddy College of Engineering (Autonomous), Mylavaram. He holds a Ph.D. in Civil Engineering from NIT Warangal and has over 15 years of experience in teaching, research, consultancy, and academic administration. He has published more than 25 research papers in SCI/Scopus-indexed journals and conferences, guided postgraduate research scholars, and completed over 50 consultancy projects in structural planning, design, and material testing.

Dr. K. Sundara Kumar is Professor and Head of Civil Engineering at Ramachandra College of Engineering, Eluru, India. He holds degrees from JNTUK, IIT Madras, and JNTUK, with over 27 years of teaching and research experience. He has published more than 80 journal papers in SCI/SCOPUS/WOS indexed journals, authored ten textbooks, secured Five granted patents and 14 published patents, and completed a DST-funded research project. His research interests include Remote Sensing & GIS, Environmental Engineering, Sustainable Construction, Application of Artificial Intelligence.

Mr. Pushadapu Vamsi Krishna: Assistant Professor in Civil Engineering at SRK Institute of Technology (SRKIT), Enikepadu, Vijayawada, Andhra Pradesh. He holds an M. Tech in Structural Engineering and Ph.D. external research scholar from Vignan University (VFSTR), Vadlamudi, Guntur specializes in integrating AIML technologies with civil engineering practices. He has published several research papers, book chapters and patents.

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