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Diptojit Datta, Ph.D.

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Professional Profile

Dr. Datta specializes in structural and mechanical engineering. He has particular expertise in developing, testing, and evaluating structural health monitoring and non-destructive evaluation techniques for critical structural components in the civil, railroad and aerospace industries. Dr. Datta has experience with acoustics, ultrasonics, laboratory testing and experiment design, sensors and data acquisition systems, vibrations and structural dynamics, digital signal processing, statistical analysis, structural analysis and design, computer vision techniques and finite element methods.

During his PhD, Dr. Datta developed high-speed non-contact ultrasonic techniques for detecting internal defects in rails and degrading ballast support conditions in railroad ties. His PhD culminated with the development of two working prototypes with real-time data processing capabilities for autonomously detecting structural defects in rails and railroad ties during regular train service runs. Dr. Datta has experience with beamforming techniques for impact and structural defect localization in plates. Other research projects Dr. Datta has worked on include delamination detection in composite plates using infrared thermography and vibration-based stiffness degradation monitoring of structures subjected to earthquakes.

Dr. Datta has a breadth of experience in teaching and industry. At UC San Diego, he worked as a course instructor and taught three undergraduate courses on Solid Mechanics. Prior to beginning his PhD, Dr. Datta worked as an Assistant Professor of Civil Engineering at Assam Engineering College, India where he taught courses such as Design of Steel Structures and Structural Analysis. As an assistant project engineer at Indian Institute of Technology Guwahati, Dr. Datta developed a user-friendly MATLAB GUI based structural health monitoring toolbox incorporating various techniques for system identification using time and frequency domain analyses. He has also worked at Larsen and Toubro Construction Limited, in India, as a quality control site engineer.

Academic Credentials & Professional Honors

Ph.D., Structural Engineering, University of California, San Diego, 2022

M.S., Structural Engineering, Indian Institute of Technology, 2017

B.S., Civil Engineering, National Institute of Technology Durgapur, 2014

University of California San Diego, Structural Engineering Dissertation Fellowship, 2022

Best Student Paper Award at the European Workshop on Structural Health Monitoring (EWSHM), Palermo, Italy, 2022

Charles Lee Powell Foundation Fellowship, 2018

Union Grants Commission (UGC) Fellowship by Govt. of India, 2015

Academic Appointments

Associate-in (course instructor), University of California San Diego, 2021-2022.

Assistant Professor, Civil Engineering, Assam Engineering College, Guwahati, India. 2018.

Prior Experience

Graduate Student Researcher, University of California San Diego, 2018-2022.

Assistant Project Engineer, Indian Institute of Technology Guwahati, 2017.

Graduate Teaching Assistant, Indian Institute of Technology Guwahati, 2015-2017.

Quality Control Engineer, Larsen and Toubro Construction, 2014-2015.

Languages

Hindi

Bengali

Publications

Datta D, Zare Hosseinzadeh A, Cui R, Lanza di Scalea F. High-speed 3D railroad tie deflection mapping in real-time using an array of air-coupled non-contact transducers. In: Rizzo P, Milazzo A. (eds) European Workshop on Structural Health Monitoring. EWSHM 2022. Lecture Notes in Civil Engineering. Springer, Cham 2022; 254: 895–904.

Zare Hosseinzadeh A, Datta D, Lanza di Scalea F. In-motion railroad tie deflection measurement via ultrasonic airborne sonar and computer vision techniques. Research in Nondestructive Evaluation 2022; DOI: 10.1080/09349847.2022.2136808

Datta D, Lanza di Scalea F. High-speed inspection of rails by passive ultrasonic monitoring. Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems 2022; 5(4) :041007.

Datta D, Dutta A. Structural health monitoring using improved subspace identification method by including rotational degrees of freedom. In: Dutta S, Inan E, Dwivedy S. (eds) Advances in Rotor Dynamics, Control, and Structural Health Monitoring. Lecture Notes in Mechanical Engineering. Springer, Singapore 2020; 215–226.

Mahato S, Datta D, Chakraborty A, Dutta A. PCA based condition assessment of RC framed building. In: Dutta S, Inan E, Dwivedy S. (eds) Advances in Rotor Dynamics, Control, and Structural Health Monitoring. Lecture Notes in Mechanical Engineering. Springer, Singapore 2020; 289–299.

Datta D, Dutta A. Comparison of black and gray box models of subspace identification under support excitations. Structural Monitoring and Maintenance 2017; 4(4): 365-379.

Presentations

Datta D, Zare Hosseinzadeh A, Cui R, Lanza di Scalea F. High-speed 3D railroad tie deflection mapping

in real-time using an array of air-coupled non-contact transducers. 10th European Workshop on Structural Health Monitoring (EWSHM), Palermo, Italy, 2022.

Datta D, Cui R, Batista I, Lanza di Scalea F. Application of a high-speed non-contact ultrasonic technique coupled with statistical data redundancy for rail inspection. International Workshop on Structural Health Monitoring (IWSHM), virtual, 2021.

Datta D, Cui R, Lanza di Scalea F, Wilson R. High-speed rail inspection by a non-contact passive ultrasonic technique. Transportation Research Board 100th Annual Meeting, virtual, 2021.

Datta D, Batista I, Zare Hosseinzadeh A, Lanza di Scalea F. High-speed inspection of rails by output-only ultrasonic monitoring. 48th Annual Review of Progress in Quantitative Non-destructive Evaluation (QNDE), virtual, 2021.

Peer Reviews

Transportation Research Records

Journal of Marine Science and Engineering

Applied Sciences