BRUCE PODWAL SEMINAR SERIES
CIVIL ENGINEERING DEPARTMENT
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Smart Sensor Technologies for Structural Monitoring

Yi Bao, Ph.D, Associate Professor
Department of Civil, Environmental and Ocean Engineering
Stevens Institute of Technology, Hoboken, NJ 07030

Abstract

The aging civil infrastructure faces many challenges such as climate change and increasing human activities. Maintenance and rehabilitation of the aging infrastructure are major financial burdens. Infrastructure condition monitoring tasks can detect anomalies at early stages to avoid catastrophic consequences and enable cost-effective rehabilitation. Recent advances in sensing technologies and machine learning have offered innovative solutions to improve sustainability, resilience, and intelligence of infrastructure. This presentation will discuss recent development of distributed fiber optic sensors, ultra-wideband (UWB) sensors, computer vision, and machine learning approaches for intelligent monitoring of civil structures and materials in normal and harsh environments. This presentation will cover fundamental knowledge about the sensing principles and measurement technologies as well as representative applications of the technologies.

Biographical Notes

Yi Bao is an Associate Professor in the Civil, Environmental and Ocean Engineering Department and directs the Smart Infrastructure Laboratory at Stevens Institute of Technology. His research interests include smart sensors, materials, structures, robots, and machine learning for improving the sustainability, resilience, and intelligence of civil and energy systems. His research has been funded by government agencies such as NSF, NOAA, USDOT, DOE, DOD, USDA, nonprofit organizations such as ACI, and private companies such as the NEC Labs and Sto Corp. Dr. Bao has led multiple multi-institute million-dollar research projects, which were rated "Effective" in project reviews. Dr. Bao serves as the Associate Editor for multiple journals such as ASCE's Journal of Bridge Engineering and an Editorial Board Member for over ten journals. To date, Dr. Bao has authored over 180 peer-reviewed journal papers with over 7000 citations and h-index of 52. Since 2022 he has been ranked as a Top 2% Highly Cited Scientist by Stanford University. He has received many awards and honors such as the 2022 Best Paper Award from the journal of Engineering Structures.

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