INSTITUTE FOR FUTURE TECHNOLOGIES
An NJIT-BGU Partnership

אוניברסיטת בן-גוריון בנגב
Ben-Gurion University of the Negev

NJIT New Jersey Institute of Technology

CIVIL & ENVIRONMENTAL ENGINEERING SEMINAR SERIES

Igal Shobet
Professor
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Advanced methods for the maintenance of municipal infrastructure systems

At a time of worldwide infrastructure renewal of infrastructure systems for the delivery of needed societal services, the condition and sustainability of existing often aging and failing systems are largely ill-defined in fragmented enterprise systems. Additionally, safe, and risk-informed streamlined planning and excavation of underground utilities is of critical importance, as it is an area that has traditionally led to the highest delays and cost overruns in highway and municipal construction. Research activities of NJIT and BGU researchers aim at delivering sustainable optimal infrastructure solutions by using data and AI driven processes as well as advanced contracting and work implementation mechanisms and rules. This presentation first introduces the concept, dimensions, and current practices of bundling, and then it reviews capital improvement alternatives in water distribution systems. Second, optimization models for bundle definition and investment scheduling are presented along with a proposed stochastic predictive methodology for advanced project bundling and work packaging. Third, a case study for a stormwater drainage system performance analysis is presented in response to a multi-year history of rainfall events. A probabilistic model and a failure model are derived, leading to the identification of the areas in need for a range of measures in preventive maintenance, monitoring, and capital improvement.

Thursday, December 9th, 2021 | 10:00 AM ET | 5:00 PM Israel
Click Here: Zoom Meeting Link

The research activities of Prof. Igal Shohet (b. 1959) cover a broad range of topics including Extreme Events Engineering and Management, Critical Facilities Maintenance and Management, Construction Engineering and Management, and Automation in Construction. After studying a B.Sc. in Civil Engineering focus on Structural and geotechnical Engineering, Professor Shohet carried out his M.Sc. in Construction Management, and D.Sc. in Civil Engineering on Robotics in Construction. All degrees were at the Technion – Israel Institute of Technology. In 2004 Professor Shohet joined the founders of the Department of Structural Engineering at Ben-Gurion University; he is the head of the Construction Management Program since its establishment and the deputy-chair of the department between 2005-2019. The Department and its study program were evaluated by an International Advisory Committee of the Israel Council for Higher Education to equal the top level Civil Engineering Institutions in the Western Hemisphere. Professor Shohet's Facilities Management models are widely implemented in Healthcare and Critical Infrastructures in Israel and abroad. Prof. Shohet published more than 50 publications in peer-reviewed journals and more than 100 publications in international and national conference proceedings. Professor Shohet Scopus H-Factor is 22 and Google-Scholar-H-Factor is 26. His present research is carried out in risk management, disaster resilience, and Extreme Events Engineering and Management in Critical Infrastructures. Igal serves as editorial board member and editor in Applied Sciences and International Journal of Strategic Property Management. Professor Shohet has been awarded the honor of outstanding contribution to the Civil Engineering Community in Israel by the Israel Association of Civil Engineers (2017) and as Honorary Professor at ChaoYang University of Technology, Taiwan.

Fadi Karaa is an Associate Professor and Director of the MSCE, MS Critical Infrastructure Systems (CIS) and MS EnE Programs in the Department of Civil and Environmental Engineering at NJIT. After a career in academia and industry, he joined NJIT in 2006 and founded the inter-disciplinary MS in CIS. Dr. Karaa has expertise in the areas of construction management and infrastructure performance management and decision support systems, particularly for water, wastewater, and fiber optic/ITS facilities networks. Dr. Karaa's research has been funded by NSF, the New Jersey Department of Transportation, the US Army Corps of Engineers, RITA/University Transportation Center, the New jersey Department of Environmental Protection and others, and led to the development and implementation of methodologies, processes and systems for water distribution and wastewater asset management decision support systems, dam safety management and inventory and location decision models for ITS underground utilities. He has also led a large multi-disciplinary research project related to post-Sandy improved resilience from flooding of the Meadowlands in NJ. He holds a MS and PhD in Civil Engineering, and well as a MS in Management (MIS and Finance) from MIT.

Rayan H. Assaad is currently an Assistant Professor at the Department of Civil and Environmental Engineering at NJIT. Dr. Assaad's research interests include applied machine learning; infrastructure asset management of above and underground systems; sustainability, resilience, and environmental impacts of infrastructure facilities; and modeling, simulation, and optimization of infrastructure and construction operations. Dr. Assaad previously worked as a project manager, and he has authored and co-authored two book chapters and more than 30 peer-reviewed journal and conference papers. At NJIT, his research lab focuses on smart cities and intelligent infrastructure systems; innovative facility maintenance, repair, and rehabilitation; and next-generation technologies.

Dr. Shabtai Isaac is an expert in automation and robotics in construction. Dr. Isaac's research focuses on the development of models and tools for planning and managing construction projects and has been published in over 50 journal and conference papers. Recipient of a number of research grants, including a grant from the European Commission for the development of Net Zero Energy settlements. Member of the board of directors of the International Association for Automation and Robotics in Construction and officer of the European Council on Computing in Construction.