

Title: The Under-Appreciated Relationship Between Resilience and Forensic Engineering

Abstract: Forensic engineering is often thought of as a process that begins when an event or failure occurs. As individuals and society seek to recover from the event, assessments seek to quantify how resilient the system that failed was and importantly, how to re-build to avoid similar failures in the future. Within this context, forensics tend to follow the event and resilience seeks to plan for the future. This lecture revisits the relationship between resilience and forensic engineering and seeks to illustrate how forensics can enhance resilience and vice versa. Specifically, the lecture will illustrate classical reactive resilience based on a range of post-event observations including earthquakes, tsunamis, floods, and debris flows and use this to distinguish the difference between reactive resilience from predictive-adaptive resilience. The lecture will illustrate the critical inter-relationship between forensics and resilience using perhaps the most famous and long duration resilience case history of all, that of the Leaning Tower of Pisa.

Bio: Dr. J. David Frost is the Higginbotham Professor of Civil Engineering and a Regents' Entrepreneur at the Georgia Institute of Technology. He obtained BA and BAI degrees in Mathematics and Engineering from Trinity College, Dublin, Ireland and MS and PHD degrees in Civil Engineering from Purdue University, West Lafayette, Indiana, USA. Throughout his research and teaching career, Frost has studied natural and man-made disasters and their impacts on infrastructure with a goal to understand how to improve their resilience at multiple scales using digital data collection and analysis systems. He is President of the Geosynthetic Institute at Georgia Tech and was elected Vice-President for North America of the International Society for Soil Mechanics and Geotechnical Engineering at ICSMGE 2026 in Vienna. Apart from his academic activities, he is co-founder of 2 software companies that were derived from his research activities and he holds numerous patents. He is a member of the US National Academy of Inventors.

