**Transportation Infrastructure Assessment Techniques Using Ground Penetrating Radar**

The continuous monitoring of transportation infrastructure is necessary to maintain a durable and safe system. Many noninvasive techniques have been used including instrumentation, acoustic emission, infrared, and electromagnetic waves.Ground penetrating radar (GPR) technologybased onElectromagnetic waves,hasbeen used to assess the performance of transportation facilitiesfor the past three decades. After all this time, the main question remains: “How well does GPR work and under what conditions?” Results show that while GPR works well for some situations, itis not appropriate for others. GPR has been successfully used for bridge and pavement assessment, primarily for estimating layer thickness and localizing moisture accumulation within structure layers. However,GPR data interpretation is often difficult because the “images” obtained from GPR-reflected signals are dependent on thepriori unknown dielectric properties of structural materials. In addition, GPR cannot detect layer interfaces unless a significant contrast in the dielectric constants exists between the two considered materials. GPR data analysis can also be cumbersome and unreliable due to the large amount of data collected during the surveys. Various signal and data processing techniques have been developedto estimate the dielectric properties of surveyed structures from GPR reflected signals. These processing techniques have been successfully used to enhance the accuracy of GPR data interpretation results and to improve the quality of the GPR signal. Among his diverse research interests, Dr. Al-Qadi has been working on GPR research for more than two decades. He is currently working on utilizing GPR data to predict in-situ real-time asphaltic material density. Dr. Al-Qadi will discuss the recently developed techniques and their field application for quality control/quality assurance, predicting the layer thicknesses of pavement systems, detecting flaws,and predicting density of asphalt concrete.

Professor Al-Qadi is the Founder Professor of Engineering at the University of Illinois at Urbana-Champaign. He is also the Director of the Advanced Transportation Research and Engineering Laboratory (ATREL) and the founding Director of the Illinois Center for Transportation (ICT). Prior to that, he was the Charles E. Via, Jr. Professor at Virginia Tech. A registered professional engineer, Professor Al-Qadi has authored/ coauthored more than 550publications and has delivered more than 500presentations including numerous keynote lectures. He has received numerous awards including NSF Presidential Young Investigator Award, quadrennial 2002 IGS Award, 2007 ASCE James Laurel Prize. In 2010, he was elected as an ASCE Distinguished Member for his exemplary leadership and innovation in the civil engineering profession. Professor Al-Qadi is very active in his profession; he has chaired many technical committees in ASCE and TRB and organized/chairednumerous international conferences. He is an elected member of the ASCE Transportation and Development Institute (T&DI) Board of Governors and currently the President, and the Editor-in-Chief of the *International Journal of Pavement Engineering.*