

Environmental Engineering Seminar

The Department of Civil and Environmental Engineering presents



Dr. James Tsai
Professor, Georgia Tech

Date: September 15, 2017

Time: 3:00-4:00 pm

Place: WPH B27

Smart Cities Transportation Asset Health Condition Assessment and Management Using Emerging 3D Technologies and Artificial Intelligence

Roadway infrastructures, including pavements, bridges, and signs are deteriorating rapidly due to material aging, improper usage, harsh environments, and damages resulting from natural or man-made hazards. With the advancement of sensor technologies, it become feasible to collect the large-scale in-field detailed infrastructure data, such as 3D pavement surface data, using high-performance cameras, lasers, LiDARs, and Inertial Navigation System (INS) to gain better insight understanding of the large-scale in-filed infrastructure behavior. An intelligent sensing system will be presented, using 2D Imaging, Laser, LiDAR, and GPS/GIS Technologies with artificial intelligent and pattern recognition to automatically detect pavement surface distress, including rutting, cracking, raveling, etc. along with an innovative crack fundamental element (CFE) model that is a topological representation of cracks to support crack classification, diagnosis, and intelligent pavement management. Cases of automatic roadway health condition assessment and intelligent infrastructure management will also be presented.

About the Speaker

Dr. James Tsai is a professor in the School of Civil and Environmental Engineering and an adjunct professor in the School of Electrical and Computer Engineering at Georgia Tech. After working as a senior research engineer in the Center of GIS at Georgia Tech for 10 years, Dr. Tsai has joined the faculty in School of Civil and Environmental Engineering in 2007 as an Associate Professor. Dr. Tsai has received his Ph.D. and MS degrees from Georgia Tech in 1994 and 1996 respectively. Dr. Tsai's research focuses on the development of spatial information and sensing optimization (SISO) methodologies, using 2D imaging, 3D LiDAR, and GPS/GIS technologies along with artificial intelligence and pattern recognition. Dr. Tsai was selected as a Chinese Changjiang Scholar in 2009, one of the most prestigious scholar's honor awarded by the Chinese government, in recognition of his research on applying sensor and information technology to infrastructure management. His research project, "Implementation of automatic sign and pavement condition evaluation on Georgia's interstate highways", sponsored by the Georgia Department of Transportation (GDOT) has been competitively selected to receive the 2017 AASHTO High Research Value Award.