FUTURe CITy – Seminar Series 2017-2018

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2:00 - 3:00 pm
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Big Data and its impact in the Design, Construction, and Operations of Smart Buildings and Smart Infrastructure Systems

Summary
It is certainly no surprise that construction and operations of buildings and infrastructure systems require a huge amount of information from specifications, plans, construction documents, inventory management, cost estimating, and scheduling, for the design and construction phase and maintenance records, inspections and sensor data for the operations phase. As the AEC industry adopts new computer technologies like laser scanners, sensor networks, RFIDs, digital cameras, among many other data acquisition technologies computerized construction/operations data are becoming more and more available. There exist numerous opportunities to exploit this vast amount of data. Unlike much previous data management research that has been successfully applied in several domains, in the AEC domain, however, the data are of multiple types and from many different sources, some with very low quality.

At the same time that we have increasing access to data, infrastructure systems, broadly defined to include buildings and other facilities, transportation infrastructure, telecommunication networks, the power grid and natural environmental systems will require more and more that engineers provide a continuous state awareness, assessment and proactive decision making for the complete life-cycle of the systems and processes they create. Such continuous state awareness and proactive decision making will allow these systems to be more efficiently and effectively managed in both normal and abnormal conditions.

There are many technological developments and research projects that already support, or begin to support this vision. At this talk professor Soibelman will introduce his vision and work developed within his research group with focus on the application and exploration of emerging Information and Communication Technologies (ICT), to a broadly defined set of buildings and infrastructure systems and associated processes, such as planning, design, construction, facility/infrastructure management, and environmental monitoring, so as to improve their sustainability, efficiency, maintainability, durability, and overall performance of these systems.

Biographical Profile
Professor Soibelman obtained his Bachelor and Masters Degrees from the Civil Engineering Department of the Universidade Federal do Rio Grande do Sul, Brazil. He worked as a construction manager for 10 years before moving in 1993 to the US where he obtained in 1998 his PhD in Civil Engineering Systems from the Civil and Environmental Engineering Department at the Massachusetts Institute of Technology (MIT).

In 1998 he started as an Assistant Professor at the University of Illinois at Urbana Champaign. In 2004 he moved as an Associate Professor to the Civil and Environmental Engineering Department at Carnegie Mellon University (CMU) and in 2008 was promoted to Professor. In January 2012 he joined the University of Southern California as the Chair of the Sonny Astani Department of Civil and Environmental Engineering.

During the last 20 years he focused his research on advanced data acquisition, management, visualization, and mining for construction and operations of advanced infrastructure systems. He published over 150 books, books chapters, journal papers, conference articles, and reports and performed research with funding from NSF (NSF career award and several other NSF grants), NASA, DOE, US Army, NIST, IBM, Bosch, IDOT, RedZone Robotics among many others funding agencies. He is the former chief editor of the American Society of Civil Engineers Computing in Civil Engineering Journal. In 2010 he received the ASCE Computing in Civil Engineering Award, in 2011 he received the FIATECH Outstanding Researcher Celebration of Engineering & Technology Innovation, or CETI, Award, and in 2013 he was elected an ASCE fellow. In 2015 he was selected by the Chinese Government as a 1,000 talent foreign scholar being appointed as a Chair professor at Tsinghua University, and in 2016 he was appointed as USC Viterbi Dean Professor, received the ASCE Construction Institute Construction Management Award, and received the ASCE Richard R. Torrens Award in recognition of his contributions as chief editor of the ASCE Journal of Computing in Civil Engineering.

His areas of interest are: Use of information technology for economic development, information technology support for construction management, process integration during the development of large-scale engineering systems, information logistics, artificial intelligence, data mining, knowledge discovery, image reasoning, text mining, machine learning, advanced infrastructure systems, sensors, streaming data, and Multi-reasoning Mechanisms.