Towards Autonomous Urban Infrastructure: Why and How

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SLH 102

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Abstract

The worldwide growth of urban population, climate change and resource constraints are driving a rethinking of the way we design, construct and operate the civil infrastructure that supports our cities, both new and old. Concurrently, recent advances in sensing and communication are allowing us to peer into urban phenomena and infrastructure in a dramatically different way. However, cost-effective and scalable solutions for these so-called "smart cities" remain challenging. In this talk, I will describe recent efforts by my group and colleagues at Carnegie Mellon University to address these scalability challenges through novel applications of sensing and machine learning. In particular, I will focus on indirect sensing techniques that allow us to extract granular information about infrastructure conditions at a reduced instrumentation/labor cost and describe two research projects in this domain: one on electricity demand disaggregation, and one on structural health monitoring.

Speaker Bio

Dr. Mario Bergés is an Associate Professor, at the Department of Civil and Environmental Engineering, at Carnegie Mellon University. Bergés studied under USC Sonny Astani Department Chair Lucio Soibelman when receiving his PhD at Carnegied Mellon University. His research interests are in making our built environment more operationally efficient and robust through the use of information technologies, so that it can better deal with future resource constraints and a changing environment. In other words, his interests lie in providing buildings, and otherman-made structures that support our urban environment, with the ability to sense, plan and act autonomously, just as many living organisms do.