Data-driven Infrastructure Informatics in Intelligent and Resilient Cities

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The rapid revolution in sensing, computation, the internet of things, and mobile devices over the past two decades has provided exciting opportunities for integrated sensing networks in the urban environment and has created a path towards achieving resilient engineering systems. Embedded and interactive sensory networks can deliver comprehensive feedback about the true conditions of structures, and produce information that can assist the operation, maintenance, rehabilitation, and functionality of structures and infrastructure. Simultaneously, we live in a time where ubiquitous smartphones contain dozens of different sensors and empower the public to regularly "crowdsense" infrastructures. Mobile sensor data streams enable a unique potential to monitor infrastructure at rates and scales not possible in the past. The objective of this presentation is to provide a vision for how research in health monitoring techniques, sensor networks, machine learning, and the internet of things, supplemented by laboratory and field implementations, progresses to resilient and cooperative infrastructure systems in a smart and connected urban environment.

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