中央研究院 資訊科學研究所
Institute of Information Science, Academia Sinica

Distinguished Lecture Series
Embedding Intelligence in Urban Infrastructure: Array of Things

Thursday, September 12, 2019 10:00am

Auditorium 106,
Institute of Information Science, Academia Sinica

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Abstract

There is a growing science community, spanning nearly every discipline, pursuing research related to the growth and operation of cities and the impact of such environments on the health and well-being of city dwellers. With input from scientists, policymakers, and residents of Chicago, Argonne National Laboratory and the University of Chicago created the Array of Things (AoT)—a new form of intelligent urban measurement system implemented in partnership with the City of Chicago. AoT provides data with greater spatial and temporal resolution than is currently available for understanding air quality, microclimate, vibration, noise, and other factors, providing measurements from hundreds of locations throughout the city. AoT devices include embedded, remotely programmable artificial intelligence capabilities—"edge computing"—to process images, sound, vibration, and other data within the installed devices, creating measurements that cannot be obtained from traditional sensor networks. These new forms of measurement range from the flow of people and vehicles through public spaces to the impact of rail crossings on emergency response. AoT is being implemented in a growing number of cities worldwide, and provides open and free data along with tutorials, data analysis tools, and application programming interfaces.

Biography

Charles Catlett is a Senior Computer Scientist at the U.S. Department of Energy's Argonne National Laboratory and a Senior Fellow at the University of Chicago's Mansueto Institute for Urban Innovation. His current research focuses on urban data analytics, urban modeling, and the design and use of sensing and "edge" computing technologies embedded in urban infrastructure. He is the principal investigator of the NSF-funded "Array of Things" (AoT), an experimental urban infrastructure to measure the city's environment with sensors and embedded ("edge"), remotely programmable artificial intelligence hardware. Operating at over 100 locations in Chicago, AoT is expanding to 200 during summer 2019. Catlett has served as Argonne's Chief Information Officer and before joining UChicago and Argonne in 2000, he was Chief Technology Officer at the National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign. From NCSA's founding in 1985 he participated in the development of NSFNET, one of several early national networks that evolved into what we now experience as the Internet. During the exponential growth of the web following the release of NCSA's Mosaic web browser, his team developed and supported NCSA's scalable web server infrastructure. He is the founding director of the Urban Center for Computation and Data at the University of Chicago and is a Computer Engineering graduate of the University of Illinois at Urbana-Champaign.

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