

Intelligent Sensing and Sensor Web: Design and Deployment Experiences

Speaker: Dr. WenZhang Song, Assistant Professor of Computer Science at Washington State University

Abstract

NASA invests to develop smart "sensor web" to provide timely, on-demand data and analysis, and enable practical benefits for scientific research, national policymaking, economic growth, natural hazard mitigation, and the exploration of other planets in this solar system and beyond. An erupting volcano, like Mount St. Helens, provides a challenging environment to examine and advance sensor web technology. Various geophysical and geochemical sensors have been applied to study the various complex phenomena before or after eruptions (e.g., magma movements, lava dome collapse, ash fall, gas emission, pyroclastic flow, mud flow, landslide, etc). The crater at Mount St. Helens is a dynamic 3-dimensional communication environment, with batteries as the only reliable energy source. To determine an volcano events, it requires the correlation analysis among different sensors. In addition, the sensors can be destroyed occasionally by the eruption. Hence, an in-situ network shall be self-organizing and self-healing, and have the capability to optimize resources usage according to environment situations and network situations, e.g., situation awareness. In the talk, Dr. WenZhan Song will discuss the research challenges, system design and field deployment experiences of a smart sensor web for volcano monitoring.

Short bio

Dr. WenZhang Song is an Assistant Professor of Computer Science at Washington State University and Director of the SensorWeb Research Lab. He is currently principal investigator for a \$1.6M NASA-funded project on "Optimized Autonomous Space - In-situ Sensorweb", which involves computer scientists, earth scientists and space scientists from NASA Jet Propulsion Laboratory, USGS Cascades Volcano Observatory and Washington State University. He is guest editor of the Journal of Ambient Intelligence and Smart Environments - Special Issue on Wearable Sensors, and was chair, Workshop on Smart Sensing and Situation Awareness in Sensor Networks 2008. He serves on many program committees.

Dr. Song received PhD in Computer Science from the Illinois Institute of Technology in 2005 and was also a receipt of Best Oversea PhD Student award (40 in US) from China Ministry of Education in 2004. Before that, he was a Member of Technical Staff at Alcatel Shanghai Bell. His research spans distributed systems, wireless networks, sensor networks, peer-to-peer content networks and algorithm design, and has received over \$2 million funding support from NASA, USGS and Boeing. Dr. Song has published over 35 book chapters, conference papers (e.g., MOBICOM, INFOCOM, MOBIHOC) and journal articles (e.g., TPDS, JPDC, MONET, WINET, TOSN). His research on wireless network topology management was selected as one of the three best papers at the ACM MobiCom 2005.