Towards Automated Information Factories

Aris M.Ouksel

University of Illinois at Chicago
aris@uic.edu

Abstract.

 There has been a growing trend toward the automated generation of massive data at multiple distributed locations, leading to a future of computing that is data-rich, heterogeneous, distributed, and rife with uncertainty. Examples include systems to monitor the physical world, such as wireless sensor networks, and systems to monitor complex infrastructures, such as distributed Internet monitors. This trend will likely continue. Most information available today on the Internet is fabricated by human data entry. While such this type of information will continue to be produced, it will be only a small fraction of the volume of information generated by automated factories. This trend raises a number of key questions: How to fuse, process, reason with and analyze this tremendous amount of automated data streams? How to integrate raw information with high-level information available in traditional media and reason about uncertainty? How to recognize emergent communities of users in this new scenario? How to reason about security in an uncertain data environment?

Our talk will focus on information-generating factories in networks of fixed and mobile heterogeneous smart sensing devices. Our goal in this area is to develop a unified model, which captures the characteristics of both the new information generating factories and the traditional information available in the cyberspace, including distribution, heterogeneity, self-emergence, dynamic resource management, reaction to complex chains of events, continuous evolution, context-awareness, and uncertainty.