

Call for Papers

Journal of Selected Topics in Signal Processing



IEEE

Special Issue on Signal Processing for Situational Awareness from Networked Sensors and Social Media

Situational awareness is of great interest in security/surveillance, disaster management, environmental monitoring, etc. At the same time, distributed data sources are common today and generate a wealth of information, e.g., surveillance cameras, smartphones, parking occupancy sensors, RFID (proximity) sensors. However, there exists a gap between the wealth of distributed information captured and the understanding of a scene where the sensors are located. The goal of this special issue is an attempt at bridging this gap by bringing together various signal processing methodologies associated with such data analysis. Since situational awareness methods in practice today often combine sensor measurements with information gleaned from social media, this issue will consider both these information sources.

Challenges in information processing from large sensor networks are many - from the use of single sensors adapting internal or external parameters, to the cooperation of multiple sensors in a networked manner. Also, the amount of data that needs to be analyzed can be prohibitive, leading to various “big data” challenges. These challenges are particularly acute for video data, the main surveillance modality today, due to its sheer volume. Recent technological developments have also led to more efficient and robust sensors that more tightly couple the acquisition and analysis phases (e.g., network cameras, smartphones). This requires the development of algorithms, ideally implemented close to the sensor and which are specifically tuned to the characteristics of the sensors. Seeking solutions to the above challenges cannot be done without considering the usage of resources, such as energy consumption, communication bandwidth, computational power, etc. Finally, a very recent data modality, that is likely to play a significant role in the future, comes from social media in the form of text, images, videos, and sound recordings. The fusion of social media data with traditional surveillance streams is an uncharted, but potentially fertile, territory.

This special issue proposal is innovative because it aims to bring together, in one publication, novel research from diverse areas of signal processing with the common goal of exploiting “high volume data” collected daily for more efficient situational awareness. We will encourage submissions describing different approaches, both in terms of the number of sensors (networked vs. single), their types (network cameras, smart phones, radar, social media, etc.), data processing methodologies, and application domains. The fusion of data captured by different sensors or different platforms will be of great interest for the proposed issue as well. In order to clearly differentiate this issue from others in JSTSP, papers submitted **must** have a significant contribution to advancing the state of the art in situational awareness. Work with a variety of sensor modalities is welcome, including novel multi-modal fusion techniques.

A **list of topics** follows, but we will encourage additional topics falling within the purview of situational awareness.

- **Sensors:** Novel sensors, Sensing from mobile platforms (UAV, UGV, satellite, etc.), Beyond visual perception sensing (radar, hyperspectral, etc.)
- **Sensor networks:** Sensor network processing and control, Distributed detection, localization and tracking, Distributed machine learning for scene analysis, Multiagent coordination for wide-area coverage and analysis, Re-identification and network tracking, Network resource management, Information fusion over distributed sensor networks
- **System-level scene understanding:** Multi-modal fusion, Context-based object description and scene understanding, Event annotation, summarization and visualization, Inferring spatio-temporal, causal and contextual relations between events, Multimedia Analytics
- **Exploitation of social media for situational awareness:** Visual data analysis in large online repositories (e.g., YouTube, Instagram), Context analysis in social media (e.g., Twitter, Facebook, etc.), Fusion of sensor and social data

Prospective authors should visit <http://www.signalprocessingsociety.org/publications/periodicals/jstsp/> for information on paper submission. Manuscripts should be submitted using Manuscript Central at <http://mc.manuscriptcentral.com/jstsp-ieee>.

Dates

Paper Submission	First Review	Revision Due	Final Decision	Camera Ready	Expected Publication
1 March 2014	1 June 2014	1 August 2014	1 October 2014	15 November 2014	First half of 2015

Guest Editors

Amit K. Roy-Chowdhury, University of California, Riverside, USA; amitrc@ee.ucr.edu

Christian Micheloni, Università degli Studi di Udine, Italy; christian.micheloni@uniud.it

Janusz Konrad, Boston University, USA; jkonrad@bu.edu

Mohan S. Kankanhalli, National University of Singapore, Singapore; mohan@comp.nus.edu.sg

Pramod Varshney, Syracuse University, USA; varshney@syr.edu