

Call for Papers
IEEE Signal Processing Society
IEEE Journal of Selected Topics in Signal Processing
Special Issue on Distributed Processing in Vision Networks

Technological advances in the design of image sensors and embedded processors have facilitated the development of efficient embedded vision-based techniques. Design of scalable, network-based applications based on high-bandwidth data such as images requires a change of paradigm in the processing methodologies. Instead of streaming raw images to a powerful, central processing unit, in the new paradigm each network node utilizes local processing to translate the observed data into features and attributes, which are shared with other network nodes to make a collaborative deduction about the event of interest. Many novel application areas in smart environments such as patient and elderly care, ambient intelligence, multimedia and gaming can be enabled by such distributed processing approach to algorithm design for image sensor networks.

To fully utilize the efficiencies offered by the new paradigm, it is necessary to consider its ramifications on the design of the hardware, in-node processing, and collaboration mechanisms. This raises issues on the effective ways of collaboration and levels in which data can be exchanged between the nodes. In addition, effective local processing methods based on opportunistic use of information acquired from the scene or received from other nodes need to be investigated. Joint estimation and decision making techniques need to be developed taking into account the processing capabilities of the nodes as well as the network bandwidth limits and application latency requirements. Spatiotemporal data fusion algorithms employing information obtained by the network across the dimensions of space, time, and feature levels and the impacts of the various cost and efficiency tradeoffs need to be examined against the requirements of the application.

The goal of this special issue is to provide insight into the design methodologies for vision networks from a distributed signal processing perspective. Original papers, previously unpublished and not currently under review by another journal, are solicited that cover one or more of the following topics:

- Spatiotemporal data fusion techniques for image sensor networks
- Multi-camera detection and tracking algorithms
- Distributed and joint estimation methods
- Probabilistic data exchange and decision fusion
- System architecture and hardware platforms for distributed image sensing and processing
- Collaborative algorithms for embedded processors
- Protocols for sharing estimates and attributes between network nodes
- Applications of distributed image sensors in smart environments

Prospective authors can find submission information at <http://www.ece.byu.edu/jstsp>, and are advised to follow the Author's Guide for the formats of manuscripts submitted to the IEEE Transactions on Signal Processing as detailed at <http://ewh.ieee.org/soc/sps/tsp/>. The manuscripts will undergo peer review process.

Submission deadline: **October 31, 2007**
First round of reviews completed: December 20, 2007
Revised manuscripts due: February 5, 2008
Second round of reviews completed: April 5, 2008
Final manuscripts due: May 1, 2008

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