

Sensing and Information Extraction

Abstract

Sensors are widely used in almost any engineering system involving information flow and processing. Typical applications of these systems include control and health monitoring. In some designs, the information – or signals provided by the sensors – can be directly used. In other designs, however, signal processing is required before the desired information can be extracted by the sensors. The most commonly encountered example is sensor calibration. A more complex example is deriving the aircraft airspeed using a pitot tube. Before airspeed information can be extracted, a formula must first be applied to the collected raw sensor data, specifically the measured dynamic pressure. The information extracted from the raw sensor data can be more complex, at times involving additional dynamic or stochastic processes. One example is health monitoring, an application which utilizes both raw sensor data and a dynamic model in order to extract an internal property of a system.

This special session will cover a combination of each of the following topics:

- 1) **Sensor design:** A range of sensor types exists for various electrical, optical, and mechanical applications.
- 2) **Information extraction:** This topic focuses on how to extract useful or desired information from raw sensor data. Methods include any signal processing, either in the time or frequency domain, discrete or continuous, deterministic or stochastic, and algebraic or dynamic. Techniques such as Kalman filter or adaptive estimator can also be adopted for information extraction.
- 3) **Sensing fusion:** If multiple sensors are used, a sensing fusion algorithm can be implemented to extract better information by utilizing sensor redundancy. Both sensor design and the fusion algorithm can be addressed.

The deadline for submission of your contribution will be **November 29, 2013**. Both short and long papers will be considered. All submissions will be reviewed. In case of **short papers**, please submit **a summary of less than 1,000 words**. In case of **long papers**, please submit **a full paper of less than eight pages**.

If you are interested in this topic, please check the homepage of the ISFA 2014 by the following URL: at <http://www-dsc.mech.eng.osaka-u.ac.jp/ISFA2014/index.html>

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