

Sensor Selection and Information Fusion in Sensor Networks

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This talk will address two important problems in the general area of sensor management and information fusion. In dynamic environments, the selection of the most useful sensors is critical in reducing costs associated with data collection and processing. Many sensor selection algorithms exist for opportunistic sensing, and popular strategies include information driven approaches. The main idea is to select the sensors that can provide the most useful information, which is measured by entropy or mutual information. This talk will discuss our recently proposed *posterior* Cramer-Rao lower bound (PCRLB) based approaches to solve sensor management problems, by controlling the PCRLB of target state estimation. Both unconditional as well as conditional PCRLB based approaches will be described. The second problem to be discussed is that of information fusion that efficiently exploits the synergy between disparate sources of information. Disparate information arises due to different sensing modalities, sensor placement or viewing angles. Typically, dependence between sensor data is neglected. The choice of an appropriate correlation measure to capture dependence is critical for fusion as this dependence is the driver for enhanced system performance. This talk will describe some of our ongoing work on the application of copula theory for information fusion and inference in sensor networks.