

## **Challenges In Distributed Structural Health Monitoring And Control**

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With sensors becoming smarter embedded with local computation abilities and commonplace, there has been a growth in their use for structural health monitoring (SHM). The use of sensors for structural monitoring, unlike some other sensing tasks needs significant domain knowledge, which computation and control researchers are not known to have. To meet the objectives of SHM in an optimal and efficient way, a comprehensive approach to the SHM is necessary, requiring experts from several domains. For example, in a typical SHM system, the goal is to track potential changes in structural service condition (e.g. crack, corrosion, concrete spalling, etc.) on physical structures and trigger an early alert of changes detected to enhance safety. The way sensors are currently deployed today is operated in a centralized, global way, making them vulnerable to malicious attack and system failure. A sound approach to achieving this goal needs experts from civil, structural, mechanical, and electrical engineering communities to address various aspects of the problem including data acquisition, compression, aggregation, damage detection, system identification, and distributed sensing and computation in a scalable fashion. This paper would be part of a special session on distributed sensing and control for Smart SHM where specific computation challenges in distributed estimation and control as it applies to SHM would be highlighted. The goal is to facilitate a synergy in approaches to enhance smart SHM.