Advances in embedded computing, sensing, and ubiquitous communication has created the possibility of building sentient spaces - physical spaces where situation monitoring using sensors (such as distributed video cameras) is used to create awareness of the environment and activities which, in turn, can be used to build a variety of new functionalities/applications and/or bring improvements to the system/applications.
Sentient technologies benefit variety of domains including infrastructure surveillance, intelligent work spaces, smart homes, and crisis response where a mobile infrastructure can be formed using adhoc networks on-the-fly to enable response personnel to monitor crisis sites.

Our goal in the SATWARE project is to build middleware and data management technologies for sentient spaces with the specific objective to:
(a) provide a powerful programming environment to build sentient applications
(b) support adaptivity to dynamically evolving application needs,
(c) support robustness in presence of physical changes in environment (e.g., drift in camera parameters), and
(d) empower applications to model and and reason with privacy issues related to data capture.
The key intuition behind the approach SATWARE takes to achieve its objectives is that the data captured by sensors is subject to the semantics and constraints posed by the real-world and its processes. Such semantics can be exploited for variety of purposes from interpreting sensors data, scheduling resources, calibration/recalibratoin of sensors, to reasoning about privacy of data capture. SATWARE provides mechanisms to explicitly represent semantics, as well as, supports mechanisms to learn semantics from data. It also supports mechanisms to use the semantics to achieve aforementioned objectives. Additionally, semantics explicitly represented/captured enable application programming at a more abstract level instead of requiring an application writer to deal with sensors, sensor and network heterogeneity, etc.

Satware has been deployed over the Responsphere infrastructure at UCI that consists of over 200 video cameras distributed inside 2 buildings (Donald Bren Hall that houses the school of Information and Computetr Science and the Calit2 building), as well as, significant portion of the outdoors.
Satware has been used to build sentient applications including surveillance, situational awareness applications, as well as intelligent office spaces with pervasive services such as location monitors