



MULTI-SOURCE MULTI-MODALITY SENSOR FUSION TECHNIQUES FOR INTELLIGENT PERSISTENT SURVEILLANCE SYSTEMS

Intelligent Persistent Surveillance System (IPSS) can be defined as the autonomous or (semi-autonomous) monitoring of behavior of targets of interests (TOIs) humans, objects, processes or phenomena via a network of single/multi-modality sensors (digital cameras, infrared cameras, acoustic, seismic, etc.), where these behaviors are tested and verified against predefined (expected or desired) norms of patterns and trends. Our interests and motivations in this area stems from three main aspects: First, interests in large-scale sensor networks have been expanding due to rising concerns in homeland security, battle-field intelligence, network-centric surveillance systems and other civilian domains such. Second, hardware technology is coping with the needs stemming from these demanding applications in the form of cheap, efficient and miniaturized smart sensors. On the other hand, software technology is still behind and is highly pressured and motivated to catch up with these demands by introducing effective, efficient and smart concepts, models, and techniques that capitalize on the current available resources and push technology for future horizons. Third, the state of the art technology of Surveillance Systems has not yet matured to the level that can handle multi-modality multi-source data/information fusion.

Our research objective to develop a suitable framework for improvement of situational awareness by alignment, association, and correlation of data and information from multi-modality multi-agent (physical or biological) sensors. For this purpose, we have developed an *Energy Logic Fusion Engine* model that enables context-based mapping sensor data to perceptual situational awareness via energy-based ontology-driven aggregation of sensory information.

Applications of this technology include: Military facility surveillance, IR Military night Surveillance, Spatio-temporal statistical events and analysis, airport security, virtual fence surveillance, mass transport stations, border security for homeland security, facility surveillance etc. Furthermore, the theoretical fusion framework facilitates Fast Utilization of Sensory Information Over Network (FUSION©) and Joint Directors of Laboratories (JDL). For additional information, please contact us.

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