



Type-2 Fuzzy Kalman Hybrid Application for Dynamic Security Monitoring Systems based on Multiple Sensor Fusion

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Abstract— Multiple sensors fusion plays a major role in situation awareness, especially in modern dynamic security monitoring and tracking applications. In this paper, we focus on a specific effective set of complementary sensors [Laser (for speed measurements), Sonar (for space scanning) and RF (for access rights)]. A novel multi-agent system is obtained by fusing the above types of sensory data taking advantages of similarity and complementarity concepts. Furthermore, Kalman Filter is utilized to track next state estimates of agent(s) in uncertain environment. Finally, our proposed system transforms system state to be able to make a security awareness decision, using type-2 fuzzy logic system to handle exhibited uncertainty, for asset scenery under surveillance. It is shown that the system performance can exhibit promising improvements for this dynamic security monitoring situation as a result of using the above complementary heterogeneous set of sensors.

Index terms: Sensor Similarity, Sensor Complementarity, Type-2 Fuzzy.