Special Issue

Fuzzy Logic and Kalman Filters Applied in Robotics and Process Control

Message from the Guest Editors

The extended Kalman filter has been widely used for more than five decades using probabilistic techniques. This algorithm provides an accurate state estimation by fusing incoming information from internal and external sensors and adjusting appropriately the uncertainty matrices of the initial state estimation and of the process and observation models. However, the conventional Kalman filter has problems when dealing with asymmetric process and observation noises; it generates accumulative errors when probability distributions are propagated through non-linear equations and does not work properly in the presence of inaccurate models as those obtained from human experience. In such a way, fuzzy logic shows a complementary way to cope with uncertainty, so the combination of fuzzy logic and the Kalman filter has been widely used for the last few years in several ways: This Special Issue addresses innovative solutions in the field of state estimation and sensor fusion that combine fuzzy logic with Kalman filters, including applications from robotics to process control.

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