

Localization of Passive UHF RFID Labels Using An Unscented Kalman Filter with Relative Position Information

Theresa Nick, Jürgen Götze, TU Dortmund University, Dortmund, Germany
Werner John, System Integration Laboratory, Paderborn, Germany
Gerhard Stöner, Deutsche Post AG, Darmstadt, Germany

Summary

The localization of objects equipped with passive UHF RFID labels using the Received Signal Strength Indicator (RSSI) values is investigated. An Unscented Kalman Filter (UKF) is used for the localization of the object. Adding (N-1) additional tags with known relative position to the object (relative to its main tag), this information can be incorporated into the UKF resulting in an Unscented Kalman Filter with relative position information (UKF_{rp}). Simulation results based on measured RSSI values show that the usage of relative positioning leads to an increase in localization accuracy especially when few antennae are used.