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Computation of Association Probabilities for Single Target Tracking with the Use of Adaptive Neuro-Fuzzy Inference System

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Abstract: In this study, a simple method based on the adaptive neuro-fuzzy inference system (ANFIS) is presented for computing the association probabilities. The computed association probabilities are used to track the single manoeuvring target in the cluttered environment. A hybrid learning algorithm, which combines the least square method and the backpropagation algorithm, is used to identify the parameters of ANFIS. The tracks estimated by using the method proposed in this study are in very good agreement with the true tracks. Better accuracy with respect to the well known nearest neighbour Kalman filter and probabilistic data association algorithms is obtained.

Key Words: Target tracking, data association, ANFIS, neuro-fuzzy inference system