Applying Neural Network to Multiple Sensor Fusion Algorithm

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ABSTRACT

In the multi-target tracking systems, there are many disturbances from the outside environments to influence the estimated correctness. Moreover, when a radar system tracks a large number of targets, it needs more powerful capability to keep the tracking process. Therefore, it is important to design a new structure for the radar systems to enhance the system performance. In this dissertation, a competitive Hopfield neural network (CHNN) algorithm is proposed to improve the tracking capability. This improved technique constructs of the Kalman filter, the extended multiple-model estimator, and integrates some related techniques. Moreover, in view of the lack dynamicity in a traditional fixed sensor system, an algorithm of tracking multiple maneuvering targets in a dynamic sensor system is proposed in this dissertation. The algorithm combines coordinate conversion logics and a multiple sensor data fusion for it to work in the dynamic sensor system. With the developed algorithm, the sensors can be installed in fixed or moving systems which will improve the tracking accuracy and reliability of radar surveillance. By this way, we can diminish the errors resulted from producing maneuvering targets, then, the systems will get the better tracking results.

Keywords : Multi-target tracking system、Competitive Hopfield neural network、Extended multiple-model estimator 、Multiple-sensor fusion.

Table of Contents

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