Summary for the Second Paper

Lin Huang (lh2647)

To realize the ADAS, sensor configuration is an urgent problem to be considered. The paper presents a track-to-track fusion approach which can be used in the fusion-level processing of the architecture. The key of such kind algorithm is whether it can maintain a steady global track and the ability to deal with asynchronous. S2G and S2S are the two common fusion strategies, and the paper emphasis on the former one for the absence of predefined fusion cycle and its memory. Three algorithms are presented. AKF is taking a new track update for updating the state and covariance, however CI is trying to retain consistency instead of making explicit interpreting. And the put forward IMF algorithm is fusing using new information into the global track which can effectively decorrelate. What is important is to prove what the paper said and its method, thus three experiments have been done. Firstly, a simulation of an overtaking maneuver is done based on the three algorithms. Two important index RMSE and NEES are introduced which can evaluate the position and velocity accuracy and track consistency. From the result, we can find the IMF has the least error and relatively consistency estimate. By contrast, AKF performed worst in this two index. Also, the simulation is used to evaluate the fusion strategies. Both RMSE and NEES indicate the negative effects of an S2S fusion and the similarity between IMF and low level CKF, which is known to be most accurate fusion method. Furthermore, the result from practical test also showed IMF’s ability to retain a stable global track. Thus, both the better performance of IMF than other methods in simulation and practical application, and its similarity to the most accurate method CKF make IMF the best method of track-to-track fusion in high-level sensor data fusion architecture.