

Passive Clock Synchronization for Sensor Fusion

The fusion of data from different sensors implies that their data are brought into a consistent time frame. Unfortunately, direct synchronization is not supported by most sensors. Mere timestamping when new data enters the system does not suffice because varying system and network load (especially when working with non-real-time operating systems) often falsify the measured time. This can lead to vast errors in the fusion process.

On the other hand, many sensors have their own time system and send their timestamps along with the sensor data. These timestamps are usually more accurate, which can be exploited in order to improve the timestamps created in the local system. Olson presented an approach that uses this information to improve the timing accuracy of the system.

I give a brief overview of the algorithm and show its performance on our own data. The jitter of different data sets can follow a characteristic distribution, which is not addressed by his solution. Our idea is to analyze this distribution and use it to define a linear filter model that predicts the offset between local and remote clock. I present the concept and hopefully some first results.