Non-Parametric Bayesian Filtering for Multiple Object Tracking

By Eric Richter

Shaker Verlag Dez 2012, 2012. Taschenbuch. Condition: Neu. Neuware - Advanced driver assistance systems increase the comfort, efficiency, and safety of nowadays and future automobiles. Especially if these systems need to derive a safety critical decision like an emergency brake they require a reliable and precise environment recognition in order to keep the false triggering rate close to zero. In this work, environment recognition means to recursively estimate both the time varying number of objects in a scene and their parameters like position and velocity-so called multiple object tracking. The thesis summarizes typical state of the art multiple object tracking approaches which classically consist of separate detection, observation association, and estimation stages. Often, the detection and association steps derive decisions which are hardly reversible during the tracking process. Additionally, the majority of current multiple object tracking systems insufficiently model the spatial extension of objects though high resolution sensors like laser scanner can observe it. The scope of this work is to overcome these limitations by integrating dynamic as well as a priori knowledge into one Bayes filter, which is implemented by a reversible jump Markov chain Monte Carlo sampling approach. By that, it is possible to track spatially extended objects...

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