A U S H A N G

FREIE UNIVERSITÄT BERLIN

Fachbereich Mathematik und Informatik

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D I S P U T A T I O N

Mittwoch, 12. November 2014, 14.00 Uhr

Ort: Raum 051, Institute für Informatik, Takustr.9, 14195, Berlin

Disputation über die Doktorarbeit von

Herrn Yubin Zhao

Thema der Dissertation:

Adaptive Particle Filters for Wireless Indoor Target Tracking

Thema der Disputation:

Particle filter and its applications

Die Arbeit wurde unter der Betreuung von **Prof. Dr. M. Kyas** durchgeführt.

Abstract: Particle filter (PF), which is also denoted as sequential importance sampling (SIS) algorithm, is a Monte-Carlo (MC) method. The basic idea is generated by von Neumann and Ulam since 1946. Nowadays, it becomes a popular computational algorithm. If the transition model is based on the Markov chain, it is also named Markov chain Monte-Carlo (MCMC) method. It is a recursive Bayesian filter using the MC simulations. The key idea of PF is to employ a randomly generated samples (also denoted as particles) with associated weights to represent the posterior probability density function (PDF) of the state. Then, the state is estimated according to the samples and associated weights. As the number of samples becomes very large, the represented PDF is equivalent to the usual continuous posterior PDF. Although PF is a suboptimal solution, it is suitable to solve the problems in the nonlinear non-Gaussian systems, where the optimal solutions are too complicated to be used. It is also adaptable to fuse multiple information in the complicated environment. Therefore, it is widely used in many research areas, e.g. image processing, wireless localization and radar tracking.

This presentation provides an overview of the PF algorithm. The basic idea, major calculation steps and variations and improvements of the PF are introduced. The applications of weather prediction and received signal strength (RSS) based target tracking. The current issues and future research directions are also illustrated in this topic.

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

Interessierte werden hiermit herzlich eingeladen

Der Vorsitzende der Promotionskommission
Prof. Dr. M. Kyas