



北京理工大学

数学与统计学院学术报告

Nonlinear Filters and Neural Networks with Recursive Structure

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摘要: Filter is a subject about the estimation of a stochastic dynamical system based on a sequential of noisy observations. When it comes to systems with high-dimensionality and high-nonlinearity, the performance of classical filtering algorithms is often unsatisfactory, either in accuracy or in computational efficiency. With the development of artificial intelligence (AI), whether and how AI can solve nonlinear filtering problems has become a hotspot issue for both researchers and practitioners. In this talk, I will present the relationship between nonlinear filters, especially the Yau-Yau nonlinear filtering algorithm, and neural networks with recursive structure, and discuss the capability of this kind of neural networks to solve nonlinear filtering problems, especially in the case of systems with high-dimensionality and high-nonlinearity. The contents of this talk are based on the joint work with Dr. Xiuqiong Chen, Dr. Yangtianze Tao and Prof. Stephen S.-T. Yau.

报告人简介: 孙泽钜, 北京雁栖湖应用数学研究院 (BIMSA) 助理研究员, 2025年毕业于清华大学数学科学系, 师从丘成栋教授, 获理学博士学位。主要研究方向为非线性滤波理论、随机控制、及其与人工智能的结合。曾获北京市优秀博士毕业生、清华大学优秀博士毕业论文、博士研究生国家奖学金, 主持首批国家自然科学基金青年学生基础研究项目 (博士研究生)。研究成果发表于《IEEE Transactions on Automatic Control》、《Automatica》等期刊, 合作出版专著1部。

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