



北京大學
Peking University

报告地点： 王克桢楼1003

时间: 2月20日 13: 30-15: 00

腾讯会议ID: 312-744-959

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COOL RESEARCH

系列报告第四讲

报告人：吴均峰（香港中文大学（深圳）
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报告题目：State Estimation in
Robotics

Control, Optimization, Operations research, and Learning (COOL) Research Seminar是由北大工学院相关领域的几位老师发起，旨在为国内外青年学者提供一个交流平台，分享和探讨最新最有趣的研究成果，促进领域内和跨领域沟通学习，推动前沿理论的发展。





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State Estimation in Robotics

摘要： We first consider the range-based localization, hoping that as the number of sensors increases, the estimate converges to the true position with the minimum variance. We show that under some conditions on the sensor deployment and measurement noises, the LS estimator is strongly consistent and asymptotically normal. However, the LS problem is nonsmooth and nonconvex, and therefore hard to solve. We then devise realizable estimators that possess the same asymptotic properties as the LS one. These estimators are based on a two-step estimation architecture, which says that any square-root m -consistent estimate followed by a one-step Gauss-Newton iteration can yield a solution that possesses the same asymptotic property as the LS one. We then investigate planar pose estimation using only range measurements and study the estimators' statistical efficiency. We prove the excellent property of a two-step scheme, which says that we can refine a consistent estimator to be asymptotically efficient by one step of Gauss-Newton iteration. Grounded on this result, we design the GN-ULS estimator and evaluate it through simulations and collected datasets.



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报告人简介： Junfeng Wu received the B.Eng. degree from the Department of Automatic Control, Zhejiang University, Hangzhou, China, and the Ph.D. degree in electrical and computer engineering from Hong Kong University of Science and Technology, Hong Kong, in 2009, and 2013, respectively. From September to December 2013, he was a Research Associate in the Department of Electronic and Computer Engineering, Hong Kong University of Science and Technology. From January 2014 to June 2017, he was a Postdoctoral Researcher in the ACCESS (Autonomic Complex Communication nETworks, Signals and Systems) Linnaeus Center, School of Electrical Engineering, KTH Royal Institute of Technology, Stockholm, Sweden. From 2017 to 2021, he was with the College of Control Science and Engineering, Zhejiang University, Hangzhou, China. He is currently an Associate Professor at the School of Data Science, the Chinese University of Hong Kong, Shenzhen. His research interests include networked control systems, state estimation, and wireless sensor networks, multi-agent systems. Dr. Wu received the Guan Zhao-Zhi Best Paper Award at the 34th Chinese Control Conference in 2015. He is a senior member of IEEE. He will serve as an associate editor for IEEE Transactions on Control of Network Systems from 2023.

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