

学术报告会

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Bandit Algorithms for Channel Selection in Remote State Estimation

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摘要:

We consider a remote state estimation problem where, at each discrete time instant, a wireless sensor has several different communication channels to choose from. These channels are unreliable and introduce random packet dropouts in the communication between the sensor and the remote estimation system. To achieve satisfactory estimation performance, the best channel needs to be selected. A key difficulty of the situation at hand is that the channel dropout probabilities are unknown. We study the case where both learning of the channel reception probabilities and state estimation are carried out simultaneously. Methods for choosing the channels based on techniques for multi-armed bandits are presented and shown to ensure stability of the remote estimator. Furthermore, we define the performance notion of estimation regret, and derive bounds on how it scales with time for the considered algorithms.

简介:

Daniel Quevedo received Ingeniero Civil Electrónico and M.Sc. degrees from Universidad Técnica Federico Santa María, Valparaíso, Chile, in 2000, and in 2005 the Ph.D. degree from the University of Newcastle, Australia. He is Professor of Cyberphysical Systems at the School of Electrical Engineering and Robotics, Queensland University of Technology (QUT), in Australia. Before joining QUT, he established and led the Chair in Automatic Control at Paderborn University, Germany.

Prof. Quevedo's research interests are in networked control systems, control of power converters and cyberphysical systems security. He currently serves as Associate Editor for IEEE Control Systems and in the Editorial Board of the International Journal of Robust and Nonlinear Control. From 2015 to 2018 he was Chair of the IEEE Control Systems Society Technical Committee on Networks & Communication Systems.

In 2003 he received the IEEE Conference on Decision and Control Best Student Paper Award and was also a finalist in 2002. Prof. Quevedo is co-recipient of the 2018 IEEE Transactions on Automatic Control George S. Axelby Outstanding Paper Award. He is a Fellow of the IEEE.