Stochastic Vehicle Routing for Max Entropic Surveillance

Prof. Francesco Bullo
Mechanical Engineering
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Aula 0.2, DEI

About the speaker

Francesco Bullo is a Professor with the Mechanical Engineering Department and the Center for Control, Dynamical Systems and Computation at the University of California, Santa Barbara. His research interests focus on network systems and distributed control with application to robotic coordination, power grids and social networks. He is the coauthor of Geometric Control of Mechanical Systems (Springer, 2004) and Distributed Control of Robotic Networks (Princeton, 2009); his Lectures on Network Systems (CreateSpace, 2018) is available on his website. He received best paper awards for his work in IEEE Control Systems, Automatica, SIAM Journal on Control and Optimization, IEEE Transactions on Circuits and Systems, and IEEE Transactions on Control of Network Systems. He is a Fellow of IEEE and IFAC. He served on the editorial boards of IEEE, SIAM, and ESAIM journals and as 2018 IEEE CSS President.

Abstract

This talk discusses on the design of efficient surveillance and vehicle routing strategies for robotic networks in dynamic environments. We focus on how to search an area in a persistent manner – with minimal average time to detection, with unpredictable trajectories, and with optimally-partitioned workload among multiple vehicles. The technical approach is based on Markov chains, optimization methods, convexity properties, relaxations and coordination strategies.

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