On the Role of Common Knowledge in Decision Making Over Networks

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ABSTRACT: We discuss the role of common knowledge/common information in decision making over networks. We present the "common knowledge/common information methodology" and show how it can be used to solve a broad class decentralized control/dynamic team problems that arise in networks (e.g. communication networks, sensor networks, networks of UAVs, networks of robots, networked control systems, etc) and were previously unsolved.

We consider a multiple access communication network with non-classical information structure; we use the common information methodology to develop an algorithm that achieves full throughput and an average delay that is linear in the number of users.

BIOGRAPHY: Demosthenis Teneketzis received his Ph.D from MIT. Currently he is Professor of Electrical Engineering and Computer Science at the University of Michigan, Ann Arbor. His research interests are in stochastic control, decentralized systems, queuing and communication networks, stochastic scheduling and resource allocation, discrete event systems, and mathematical economics.