FUDAN UNIVERSITY

Applied Math Ph.D. Seminar

Byzantine-Resilient Decentralized Resource Allocation

Speaker: Runhua Wang (Sun Yat-sen University)

Time: 2024-12-12, 16:10 to 17:00

Location: Rm 1801, Guanghua East Tower

Advisor: Qing Ling (Sun Yat-sen University)

Abstract: As networks scale up and computational tasks grow increasingly complex, decentralized resource allocation algorithms have garnered significant attention in fields such as smart grids, vehicular networks, and wireless sensor networks. However, the presence of malicious agents that deviate from the given algorithm protocol and broadcast random, incorrect messages to the network poses a significant challenge. Such malicious messages can easily disrupt existing resource allocation algorithms, leading to wrong resource allocation strategies. To address this, we characterize such malicious behavior using the classical Byzantine attack model and present a series of Byzantine-resilient decentralized resource allocation algorithms. We analyze the theoretical performance of the proposed algorithms and validate their Byzantine resilience through numerical experiments.