

**ME Seminar** 



## **Cohesive Decentralized Control of Networks** with Delays

## Dr. Anuj Tiwari, University of Washington, Seattle-USA ABSTRACT

Cohesion in networks during transitions from one consensus value to another, i.e., the ability of agents to respond in a similar manner during the transition, can be as important as achieving the new consensus value. Existing decentralized network control strategies mainly concern with the convergence speed to the final consensus value. However, even with increased convergence speed, the level of cohesion loss during transitions can be large. This loss of cohesion during transition (and tracking of varying consensus values) can be alleviated using a recently developed delayed self-reinforcement (DSR) approach. However, the current DSR-based approach assumes ideal conditions with agents having instant access to neighbor information – without network delays arising during sensing or communication between neighbors, as well as computation of control actions of each agent, which can cause instability. In this talk, I will present my work on addressing the issue of cohesive transitions in networks with delays.

## **ABOUT THE SPEAKER**

Anuj Tiwari received the B.Tech. degree in Civil engineering from IIT Guwahati in 2017 and the Ph.D. degree in Mechanical Engineering department at University of Washington, Seattle, WA, USA in 2022. He is currently a Postdoctoral Scholar at University of Washington Seattle. His research focuses on distributed control of networked multi-agent systems, with a particular emphasis on cohesive network transitions, where each agent in the network moves similarly. His research includes theoretical developments for maintaining stability in higher-order agents in presence of delays and applications to cohesion in connected vehicles, and advanced composite prototyping and flexible manufacturing.



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