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Research Interests

1. Control of Semi-Autonomous Systems
2. Control of Dynamical Systems over Unreliable Networks
3. Synchronization of Dynamical Systems
4. Bilateral Teleoperation

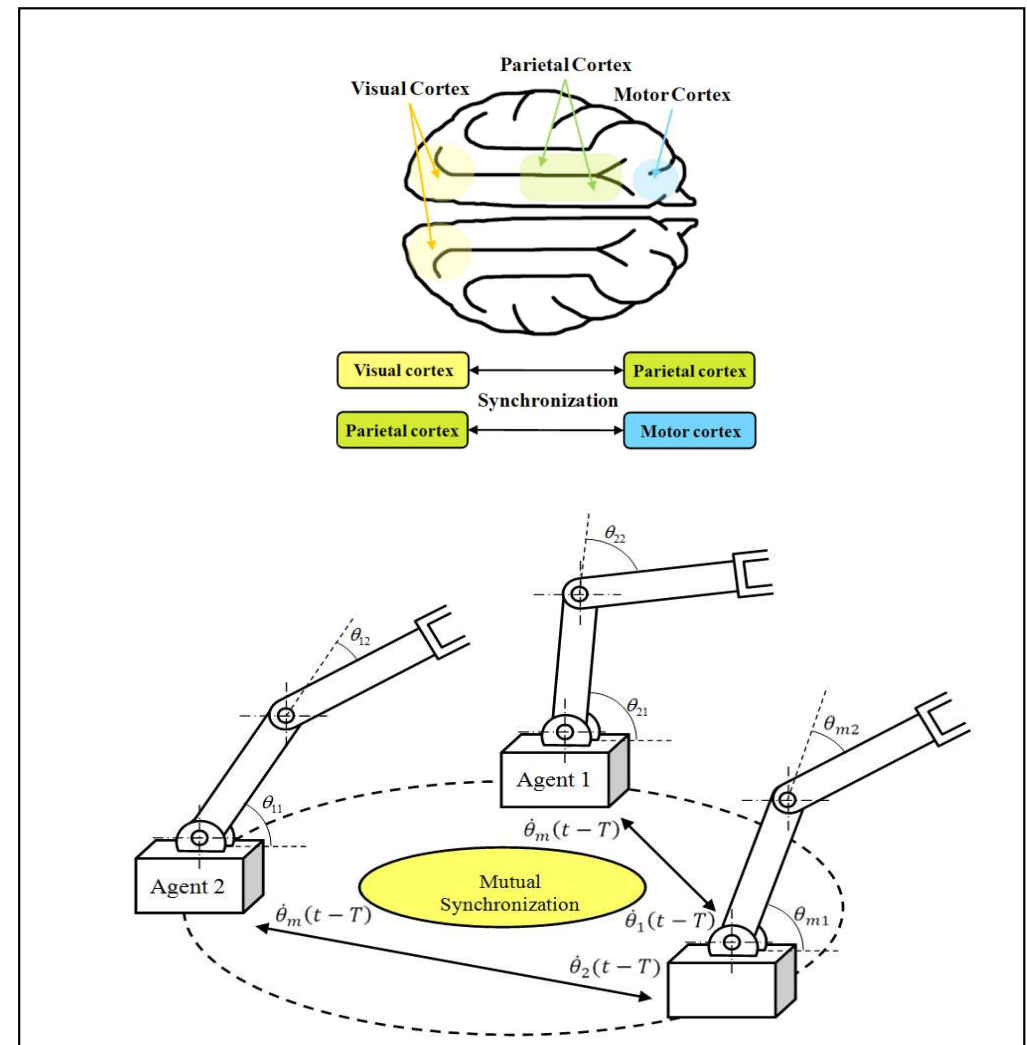
Teaching

1. *ENME 462* Vibrations, Controls and Optimization II : Spring 2008, Spring 2009.
2. *ENME 605* Advanced Systems Control: Fall 2008

Bioinspired Control of Semi-Autonomous Systems

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- Human in the loop is critical in many important areas such as healthcare applications
- Distributed synchronization and network control are key enablers in a semi-autonomous system
- The robot control literature, except for the specific problem of teleoperation, does not adequately address sensing and actuation delays
- Important to study interplay of synchronization, network control and human decision making



Zero-Lag Synchronization in Brain and in Robots

Societal Implications

- Healthcare applications
- Remote exploration and manipulation
- Pedagogical advancements

Accomplishments to Date

- Preliminary results in distributed synchronization
- Preliminary results in network control of robots

Challenges

- Understanding the underlying dynamics and control mechanisms in key “network motifs” discovered by system biologists
- Apply the understanding to develop robust and modular semi-autonomous systems

5/10/20 Year Vision

- Five Years: Discovery of new control paradigms for semi-autonomous control
- Ten Years: Reliable and trustworthy semi-autonomous systems
- Twenty Years: Reliable and trustworthy autonomous systems