As networks become ubiquitous in many areas of engineering and sciences, it has become of paramount importance to examine how the network and its structure affect the dynamic properties of the overall system, such as its stability, controllability, performance, and robustness, both in the random and deterministic settings.

Our work in this area is focused on examining fundamental aspects of networked dynamic systems with applications to:

1. networked robotics: ground, atmospheric, and space
2. semi-autonomy, mixed human-autonomous networks; see youtube video
3. security and robustness of networked systems
4. influence structure on social networks
5. design and analysis of energy networks
6. modeling and control of biological networks

Our group not only aims to contribute to the theoretical foundations of networked dynamic systems, but also pave the way for computational approaches to understand, analyze, and synthesize dynamic networks in a number of applications of current interest.

Some of our recent projects include:

Beyond Linear Consensus

AdvectionConsensusFlowChart.png

Controllability and Observability

socialCartesianProductFull.png

Network-of-Networks

concept1.png

Semi-Autonomous Consensus

pictorialSummary.png