

# Consensus in Networked, Distributed Agents

Networked Control Systems Laboratory

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**Multi-Agent Consensus:** Research focus is on the development of an autonomously-learned communication language among distributed agents. Symbols are anchored directly in the environment by having agents assign symbols to any distinct specimen in the environment that they are able to sense. Agents start with no previous knowledge of the environment. Agents then perform a classification and consensus routine in order to come to approximate agreement on specimen-symbol relationships.

**Multi-Agent Communication:** Robot-to-robot communication is implemented using line-of-sight IR communication using our custom-designed turret for K-Team® Khepera robots. Differentials in infrared reception of communication along with the strength of the signal allow for mathematical identification of the source of the transmissions. Design focus is on the development of a 7-robot hardware testbed with flexible functionality.

**Multi-disciplinary Research:** Understanding how multi-agents communicate and reach consensus and how this communication evolves over time requires multi-disciplinary research in control systems, digital electronics, communication theory, linguistics, and software programming.

