



Seminar Experience

ELECTRICAL & COMPUTER ENGINEERING

Friday, September 26 FIU Engineering Center

10:00—11:00 am

EC Room # 1107

www.ece.fiu.edu



“Multiobjective Control Architecture for Interconnected Multiagent Systems”

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ABSTRACT

Decentralized Networked Control Systems (NCS), such as remotely operated robotic systems, and groups of unmanned vehicles etc, employ exchange of information and control signals between individual systems. Today's NCSs enjoy popularity due to their decentralized control framework, and the effective use of the Internet to perform remote control functions. This research investigates consensus control of a large scale system represented as an interconnection of multiple multiagent systems, henceforth called platoons. The agents in each platoon are connected in their own communication network while only the platoon leaders are connected to global system level leader network. It is assumed that all agents are identical and are linear time invariant. For consensus control, we assume a two stage protocol: an intra-platoon protocol for platoon consensus, and an inter-platoon protocol for global system-wide consensus. The intra-platoon control is based on output information received from agents within the platoon while the inter-platoon control uses only output information of platoon leaders. We show that the system of multi-agent systems arrives at a collective consensus in the sense that each platoon arrives its own platoon consensus and at the same time all platoons collectively achieve global system-wide consensus. Simulation results are presented to illustrate the methodology.

BIOGRAPHY

Saroj Biswas is a Professor of Electrical and Computer Engineering specializing in control and optimization of dynamic systems, electrical machines and power systems, multiagent systems, and distributed parameter systems. His current research focuses on security of cyber-physical systems based on multiagent framework with applications to the power grid, and the development of an intelligent virtual laboratory for electrical machines. He has also developed a control theoretic framework for regulation of magnetic signatures. Dr. Biswas is the author or co-author of over 100 research articles in refereed journals or conferences, and has been involved with \$1.5M funded research from various industries and federal sources including NSF and ONR. He is an associate editor of Dynamics of Continuous, Discrete and Impulsive Systems, Series B, and is a member of IEEE, ASEE, and Sigma Xi.