Collaboration and Control in Networked Systems

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ABSTRACT:

A traditional scenario in systems and control engineering involves a single system to be controlled (the plant) and an associated controller.
The controller is designed to achieve some desired performance or behavior from the plant. Many modern scenarios involve a network of many plants which need to be simultaneously controlled to achieve some common objective or behavior. Examples include formation flying of unmanned air vehicles; sensor networks; communication networks; next generation traffic control system and decentralized resource allocation among many users. In these scenarios there is not a single controller but each plant has an associated controller. Also, each plant does not communicate with all of the other plants but with just a few neighboring plants. So a single centralized controller cannot be used. This gives rise to a network graph which describes the communication structure associated with the plants. This talk presents some basic results and some recent results on collaboration and control in networked systems.

BIOGRAPHY:

 Dr. Corless received his B.S. degree in mechanical engineering from University College, Dublin, Ireland in 1977. He obtained his PhD degree in mechanical engineering from University of California, Berkeley in 1984. After that he joined Purdue faculty of School of Mechanical Engineering. Dr. Corless' research interests are in the area of dynamics, control systems and automative systems. Dr. Corless received W.A. Gustafson Teaching Award in 2003 and 2009 and C.T. Sun Research Award in 2011.