IEEE KITCHENER-WATERLOO

KW-IEEE Joint Chapter on Neural Networks/Signal Processing
And the Department of Systems Design Engineering Present

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" Technologies and Applications of Distributed Intelligent Systems "

Abstract: Most information and processing systems are based on centralized technologies and design principles in which the information and knowledge are centralized at strategic sites, with access, command, and control organized in client-server architectures. Centralized systems have many disadvantages that make them unsuitable for large-scale integration. By distributing implementation details of the logistical and integration requirements, it is possible to achieve greatly improved reliability, scalability, and security.

This lecture describes distributed system technologies and applications being developed in cooperation with Canadian industry and partners of the Holonic Manufacturing Systems Consortium, a major international project of the Intelligent Manufacturing Systems Program. Intelligent distributed systems are based on the use of cooperative agents, organized in hardware or software components, that each independently handle a small set of specialized tasks and cooperate to achieve system-level goals and a high degree of flexibility. Some recent applications of intelligent distributed systems will be described, including manufacturing scheduling, robotic finishing, utility monitoring, and energy resource management.

Biography:

William A. Gruver is a Professor of Engineering Science at Simon Fraser University where he directs the Intelligent Robotics and Manufacturing Systems Laboratory. He is also Chief Executive Officer of Intelligent Robotics Corporation specializing in the development and implementation of distributed automation systems. He received the PhD, MSEE, and BSEE degrees from the University of Pennsylvania and the DIC in Automatic Control Systems from Imperial College of Science and Technology. He has held research positions at the NASA Marshall Space Flight Center and the DLR German Space Research Center, and faculty positions at North Carolina State University and the University of Kentucky where he was the founding director of the Center for Robotics and Manufacturing Systems. His industrial experience includes senior management positions with General Electric Automation Europe and LTI Robotic Systems, a California based venture that he co-founded.

Dr. Gruver's research emphasizes intelligent systems, manufacturing automation, robotics, and sensor systems. He is the Technical Management Chair of the Holonic Manufacturing Systems (HMS) Project, an international consortium with participation from more than 40 companies and R&D organizations to develop and standardize holonic and multi-agent system technologies for manufacturing automation. Dr. Gruver is the President of the IEEE Systems, Man, and Cybernetics Society. He is an IEEE Fellow, an Associate Editor of the *IEEE Transactions on Systems, Man and Cybernetics,* and co-chair of the SMC Technical Committee on Distributed Intelligent Systems.

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