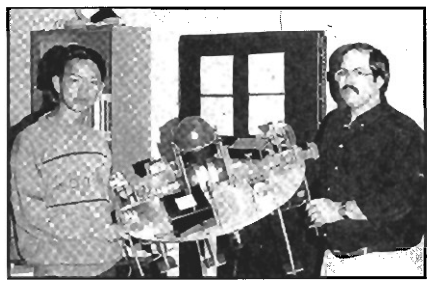
Center for Self-Organizing Intelligent Systems

Mission

To develop a world leadership position in neural networks and fuzzy inference machines (fuzzy logic) while helping Utah companies develop marketable products in these new intelligent systems technologies.

INTELLIGENT SYSTEMS TECHNOLOGY:

"Intelligent Systems" is a new term used to describe the result of combining two similar but distinct technologies of neural networks and fuzzy logic. Neural networks consist of massive parallel interconnections of simple computing elements, called artificial "neurons," which mimic the ability of the brain and its central nervous system to learn and to generalize from past experience. Fuzzy inference machines are similar to neural networks but they attempt to emulate the reasoning process fundamental to human intelligence. The approach taken by the Center for Self–Organizing Intelligent Systems (CSIS) is to combine fuzzy logic with neural networks, achieving an intelligent system which retains the distinct advantages of the two individual technologies, while eliminating their shortcomings.



Dr. R. Fullmar and graduate student S. Kuntanapreedor with the Center's 3-axis small satellite simulator, used for intelligent control system design projects.

The Center

According to the Market Intelligence Research Co. (MIRC), the worldwide market potential for embedded intelligent control systems alone is projected at a figure close to $7 billion by 1995. Although basically a U.S. invention, successful Japanese products ranging from VCR controllers to washing machines provide convincing justification for the accuracy of the MIRC projection. The basic CSIS objective is to assist Utah industry in entering this market by identifying and developing marketable products based on intelligent systems technology, as well as developing applications to enhance the competitiveness of the manufacturing process itself. The Center includes faculty and talented graduate engineering students from Utah State and Brigham Young Universities. This combination provides a broad spectrum of engineering talent and specialties, ranging from control systems to irrigation engineering, which enables CSIS to achieve its goals.

George Powell, SOIS Center Associate, with the Russian MARS 96 Robotic Rover.

INDUSTRIAL COLLABORATION:

- Manufacturing industries as diversified as Bourns Inc., Hercules Inc., and Geneva Steel can use our technology to improve product quality, reduce defects, and increase efficiency.
- Utah companies such as Parvus Inc. and Omnidata International can use our technology to develop specific new markets and products.
- CSIS faculty and students are actively working directly with Campbell Scientific's engineering and management personnel in a flagship project to transfer intelligent controller technology over to Campbell in the form of marketable open channel and pressurized flow irrigation control system products.
- Projects involving voice input data acquisition systems, autonomous control of micro–robotic vehicles, fault detection, and error diagnostic systems are getting underway.

For more information, please contact:

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