Colorado School of Mines
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Web site: http://www.mines.edu/Research/

Center for Automation, Robotics, and Distributed Intelligence (CARDI)

The Center for Automation, Robotics and Distributed Intelligence (CARDI) focuses on the study and application of advanced engineering and computer science research in neural networks, robotics, data mining, image processing, signal processing, sensor fusion, information technology, distributed networks, sensor and actuator development and artificial intelligence, to problems in environment, energy, natural resources, materials, transportation, information, communications and medicine. CARDI concentrates on problems that are not amenable to traditional solutions within a single discipline, but rather require a multi-disciplinary systems approach to integrate technologies. The systems require closed loop controllers that incorporate artificial intelligence and machine learning techniques to reason autonomously or in cooperation with a human supervisor.

Established in 1994, CARDI includes faculty from the Division of Engineering, departments of Mathematical and Computer Science, Geophysics, Metallurgical and Materials Engineering, and Environmental Science and Engineering. Research is sponsored by industry, federal agencies, state agencies, and joint government-industry initiatives. Interaction with industry enables CARDI to identify technical needs that require research, to cooperatively develop solutions, and to generate innovative mechanisms for the technology transfer. Enthusiastic and motivated students are encouraged to join CARDI for education and advanced research.

Background:
- Created in 1994
- Name changed from Center for Robotics and Intelligent Systems (CRIS) in Fall 1999
- Working towards a National Center on Intelligent Machine Systems for Hostile/Uncertain Environments
- Center hosted the 2004 International Japan-U.S.A. Symposium on Flexible Automation

Areas of Expertise:
- Neural networks
- Robotics
- Sensor/actuator development
- Artificial intelligence
- Smart Materials
- Intelligent Control
- Advanced Signal Processing
- Computer Vision
- Networking and distributed intelligence

Sponsoring Organizations:
- *Industrial and government agencies include:* National Science Foundation; DARPA; Lockheed-Martin; Cyprus/Amax; INEEL; Cooper; Colorado Advanced Technology Institute (CATI transferred to the Colorado Commission on Higher Education (CCHE) in 1999); etc.

Method of Technology Transfer:
- Works directly with industry leaders to better understand the engineering of machine automation
- Provides real-world work opportunities for students
- Provides workshops, symposiums, short courses, and special services
- Networks to an industrial expertise base
- Provides undergraduate and graduate minors in AI Robotics
- *Web site: http://www.mines.edu/research/cardi/*

Spin-offs / Contributions:
- Integration of technologies across different disciplines
- Advanced machine intelligence
- Reduced hazards, improved safety in hazardous occupations
- Education of a new generation of students

Contact CARDI Director, Dr. Kevin Moore, Engineering Division, (303) 273-3898, kmoore@mines.edu