

**McLeod Institute of Simulation Sciences,
California State University, Chico**

Annual Report, July 2005

MISS Center Reference Data

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Director: Dr. Roy E. Crosbie, rcrosbie@csuchico.edu
Director Emeritus: Dr. Ralph C. Huntsinger, drralph@csuchico.edu

Research Activities and Projects

High-Speed Real-Time Simulation of Power Electronic Systems
Category: Industry/Military
Supported by the Office of Naval Research 2004-2007

Simulation of Autonomous Underwater Vehicles
Category: Industry/Military
Jointly with the University of South Carolina and the University of Glasgow
Supported by the Office of Naval Research 2005

USE-ME United States Europe Mobility in Education
Category: Education/Training/Support
Jointly with the University of Nebraska-Lincoln, Old Dominion University, the University of Hamburg, the University of Glasgow, and the Technical University of Vienna
Supported by the Fund for the Improvement of Post-Secondary Education (FIPSE) of the US Department of Education and by the European commission 2000-2005

USE-eNET United States Europe e-Learning Network
Category: Education/Training/Support
Jointly with the University of Nebraska-Lincoln, the University of Alabama at Huntsville, the University of Hamburg, the University of Glasgow, the Budapest University of Technology and Economics, and the University of Aarhus.
Supported by the Fund for the Improvement of Post-Secondary Education (FIPSE) of the US Department of Education and by the European commission 2005-2006

Educational Activities

MISS-Chico continues to offer a MS program in Simulation Sciences in which students from any undergraduate major can construct a program which has a designated core in modeling and simulation combined with courses appropriate to their undergraduate major and a project or thesis in modeling and simulation. Graduates from the program have included majors in Electrical and Computer Engineering, Mechanical Engineering, Mathematics, Physics, Biology, Chemistry, Marine Engineering etc.

MISS-Chico personnel are active in the SCS Workforce Development and M&S Curriculum activities.

Publications

Crosbie, R.E., J.J. Zenor, R. Bednar, D. Word, N. Hingorani, and T. Ericson, *High-Speed, Scalable, Real-Time Simulation Using DSP Arrays*, Presented at IEEE/ACM Parallel and Distributed Simulation Workshop, Kufstein, Austria, 2004.

Crosbie R.E., J. J. Zenor, D. Word and N. G. Hingorani, *Fast Real-Time DSP Simulations for On-Line Testing of Hardware and Software*, Presented at the Summer Computer Simulation Conference, Society for Modeling and Simulation International, San Jose, July 2004.

Crosbie, R.E., and N.G. Hingorani, *High-Speed, Real-Time Simulators for Engineering Design*, Presented at the Advanced Engineering Design Conference, University of Glasgow, September 2004.

Simulation Tools and Labs

The main focus of current research is on high-speed real-time simulation. The Real-Time Simulation Laboratory houses the facilities that support this research. Currently two specially adapted PC systems are equipped with real-time simulation processors consisting of an array of 4 Analog Devices digital signal processors. A third system is expected to be completed by the end of August 2005. Plans are also in hand for the acquisition of an RT-LAB real-time processing system from OPAL-RT that will eventually be interfaced to one of the dsp systems.

The Virtual Test Bed (VTB) simulation environment developed at the University of South Carolina, Matlab and Simulink are the main simulation tools in current use.

Center Highlights

Dr. Roy Crosbie retired as a full-time CSU, Chico faculty member in July 2004 but continues with a part-time appointment as MISS Director and PI on the ONR and FIPSE projects. He was recently honored as Outstanding Project Director by the CSU, Chico Research Foundation.

Dr. Ralph Huntsinger, Director Emeritus, holds a faculty appointment at the Technical University of Bialystok in Poland. He is also the editor of a column on simulation languages in the SCS Modeling and Simulation magazine.

A completely redesigned website is nearing completion. The current website, which had been created and maintained by the volunteer efforts of a succession of MISS students, was proving difficult to maintain and many of its features are out of date. The new website has been designed and built by Paul Lowe a CSU, Chico undergraduate and MISS associate. The new website is planned to be in operation by the end of August.

Exchanges and Visits

Prof. Dr. Dietmar Moeller from the University of Hamburg for 2 short visits in 2004/5

Dr. Roy Crosbie to the University of Glasgow and the University of Alabama, Huntsville for short visits.

Dr. Ralph Huntsinger to the Technical University of Bialystok and INSA-Rouen.