

SIMULATED ROBOT SOLUTIONS



Robotics Simulation Software Integration

Team Members:

Bob Davis, Richard Gomes and
Brenton C. Kemmer II

Faculty Advisor: Jim Devaprasad**Project Sponsors:** Applied Manufacturing
Technologies (AMT), Lake Superior State
University (LSSU) and DELMIA Corporation**Industrial Customer Contact:**

Philip Gilbert-Senior Engineer (AMT)

Presentation: 1:30 p.m., CAS 123**Demonstration:** 3-3:45 p.m., CAS 125 Annex

A research project was conducted on the application of a new Windows-based robotic simulation software package provided by the DELMIA Corporation. Integration of this software offers transitional challenges to companies like AMT, who currently use DELMIA's older UNIX-based simulation package. SRS has aided in the validation of this software through real-world applications, educational development and robotic calibration.



SUPERIOR WORKCELL AUTOMATION TECHNOLOGY

S.W.A.T. Automated Processing of Brake Cores

Team Members:

John DeRosia, Ron Hins, Patrick Murphy,
Chris Romig, Jason Schopp and Adam Smith

Faculty Advisor: Dr. Nael Barakat**Project Sponsor:**

DANA Brake Parts / Canada (Sudbury, Ont.)

Industrial Customer Contact: Martin Castillo**Presentation:** 3 p.m., CAS 123**Demonstration:** 1:30-2:15 p.m., CAS 122

An Automated Robotic Workcell Prototype was designed and developed for DANA Brake Parts/Canada. It will reduce the number of human operators in a hazardous environment as well as labor and production costs resulting in an increase of production while maintaining better quality.

The following students, who have or will be completing their senior design projects through cooperative education employment at various industries, participated with this year's teams during the fall 2003 semester:

ECS: Vesa Luomaranta

ITS: Kevin Luft

MSE: Nicole Peterson

The School of Engineering and Technology is comprised of the following disciplines:

- Computer Engineering
- Electrical Engineering
- Mechanical Engineering
- Manufacturing Engineering Technology
- Engineering Management

All of the senior engineering and technology students at Lake Superior State University are required to complete a challenging senior design project.

The students work in teams and use a composite of their technical and general education courses to successfully complete these projects.

Each project requires a detailed technical engineering analysis and is a challenging and realistic experience for our senior graduates. The intention of the senior design project is to provide valuable engineering experience that will help the team members gain employment in industry.

More project information can be seen at:

http://engineering.lssu.edu/Students/03_04/

THE SCHOOL OF ENGINEERING & TECHNOLOGY

presents the

Class of 2004 Senior Design Project Presentations and Demonstrations



Friday • April 30, 2004
1:30 p.m. - 4:30 p.m.

in the

Center for Applied Science
and Engineering Technology



**Lake Superior
State University**



**ENERGY
CONVERSION
SYSTEMS**

Energy Conversion Laboratory Trainer

Team Members:

Matt Fitchett, Lester Jensen, Andy Ryneerson,
Gary Van Sickle and Grant Wood

Faculty Advisor: Paul Duesing

Project Sponsor: Lake Superior State University

Industrial Customer Contacts:

Dr. Matthew Carroll and David McDonald

Presentation: 2:15 p.m., CAS 123

Demonstration: 3:45-4:30 p.m., CAS 122

ECS has developed, in cooperation with Lake Superior State University, an energy conversion laboratory trainer. The trainer will enhance the laboratory experience in mechanical and electrical engineering. It will also allow the faculty of LSSU to stress the teaching of fundamental engineering concepts in thermal-fluids, power generation, and heat transfer.

**ENDFORMER PROTOTYPE
INDUSTRIAL CONSULTING**



Tube Endformer

Team Members:

Michael Bunker, Tony Prevo, Ryan Risley,
Ben Skupien, Brad Sochacki and Seth Timm

Faculty Advisor: Jon Coullard

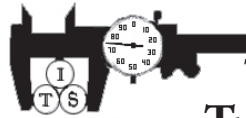
Project Sponsor: Aggressive Manufacturing
Innovations Industries

Industrial Customer Contact: Jim Klopfenstein II

Presentation: 3 p.m., CAS 212

Demonstration: 1:30-2:15 p.m., CAS 122

A Tube Endforming Machine was designed and built to form the ends of steel tubes up to a 1-inch diameter in a variety of shapes used mainly by the automotive industry. The machine utilizes a PLC to control the pneumatic, hydraulic, and safety systems to ensure a quality endformed tube. The machine will be used as a prototype design for subsequent machines to be built by AMI.



**INDUSTRIAL
TOLERANCING SYSTEMS**

Tube End Measurement System

Team Members:

Erin Becker, Ryan Earegood, Gary Gazankas,
Caleb MacDonald, Dave McAulay and
Lucas Smart

Faculty Advisor: David McDonald

Project Sponsor: Tenaris Algoma Tubes

Industrial Customer Contacts:

James Kucher and Marcos Franco

Presentation: 3:45 p.m., CAS 212

Demonstration: 2:15-3 p.m., CAS 122

A tube end measurement system was developed by ITS that will determine at what point the tube transitions from out of specifications to within tolerance. The machine movement will be controlled by a PLC and the measurement taken by lasers will be acquired using a data acquisition system.

**MOUNTAIN SIMULATION
ENGINEERING**



Brake Component Testing Systems

Team Members:

Matthew Gibbs, Michael Hilderley,
Anthony Pink, Seth Reenders,
Jeremy Wilhelm and Eric Wuchte

Faculty Advisor: Dr. Abhiman Hande

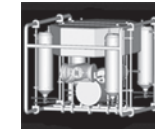
Project Sponsor: Continental Teves, Inc.

Industrial Customer Contact: Bob Andersen

Presentation: 1:30 p.m., CAS 212

Demonstration: 3-3:45 p.m., CAS 120

Two separate brake component testing systems were designed and built for Continental Teves. The systems, a force sensing hitch and a load simulating trailer, will be used to perform heat testing locally at the Brimley Development Center instead of the current location in Death Valley, California. The systems accurately represent the forces acting on an automobile as it climbs and descends a mountain.



RADAR
ROBOT FOR AQUATIC DEVELOPMENT AND RESEARCH

Remotely-Operated Underwater Vehicle

**ROBOT FOR AQUATIC
DEVELOPMENT AND RESEARCH**

Team Members: (seniors)

Claude Carrier and David O'Gorman

Faculty Advisor: Morrie Walworth

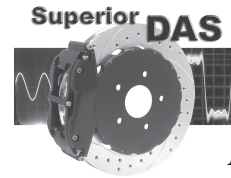
Project Sponsor: Lake Superior State University

Industrial Customer Contact: Morrie Walworth

Presentation: 2:15 p.m., CAS 212

Demonstration: 3:45-4:30 p.m., CAS 125 Annex

The team's goal was to build upon the success of last year's underwater robot, and produce a significantly enhanced ROV by re-designing many of the on-board systems as well as the user interface equipment to improve the ROV's usability and functionality.



**SUPERIOR DATA
ACQUISITION SYSTEMS**

Data Acquisition: Enhanced Vehicle Safety Testing

Team Members: (senior)

Adam Pagot

Faculty Advisor: Morrie Walworth

Project Sponsor: Continental Teves, Inc.

Industrial Customer Contact: Bob Andersen

Presentation: 3:45 p.m., CAS 123

Demonstration: 2:15-3 p.m., CAS 125

The SDAS team has produced a system for testing Continental Teves' automotive products. The system is designed to collect data from a variety of analog and digital sensors, then transfer it to a PC for display and storage.