



Automated Braking Innovations

Brake Pedal Testing System

Members:

Riley Lytwynec, Benjamin Newland, Danial Rutkowski, and Nick Sadro

Faculty Advisors:

Prof. Dave McDonald
Mr. David Leach

Company: Continental

Industrial Contacts:

Mr. Dan Goodrich
Mr. Travis Smith

Presentation: 2 pm | CAS 212
Demonstration: 2:30 pm | CAS 106C

Team Automated Braking Innovations (ABI) is designing and building an automated brake pedal applier for Continental Automotive's hardware-in-loop systems. Currently, Continental uses these hardware-in-loop systems to test brake systems, but the system must have a human operator to apply the brake pedal. Team ABI's unit will be used to automate the brake testing process by controlling the position of the pedal and how much force is applied.



Adexobot-Vision Integration Solution

Versatile Robotics Grocery Bagging System

Members:

Rob Kalinski, Josh Nelson, Brian Parkham, Nathan Shoudy, and Dion Tchokreff

Faculty Advisors:

Prof. Jim Devaprasad
Dr. Paul Weber

Company: Advenovation

Industrial Contact: Mr. Adil Shafi

Presentation: 2:30 pm | CAS 212
Demonstration: 3 pm | CAS 125

Team Adexobot - Vision Integration Solution (A-VIS) has been tasked with developing a proof-of-concept system to mimic an automated grocery bagger. The bagger consists of a robot working with a machine vision system and a versatile gripping device. This robotic bagging system will handle a variety of household items such as grocery boxes, cans, and bottles. This project will provide an automation solution that is unique to the robotics industry in its versatility and simplicity of use.



Laser Control Solutions Self-Leveling Mill Head

Members:

Jacob Clark, Logan Cowley, Josh Houska, Steven Jacobs, and Eric Stephan

Faculty Advisor:

Dr. David Baumann

Company: Mactech

Industrial Contacts:

Mr. Sam Schammel
Mr. Paul Rulach
Mr. Joel Wittenbraker

Presentation: 3 pm | CAS 123
Demonstration: 3:30 pm | SmartZone

Team Laser Control Solutions (LCS) is working alongside Mactech On-Site Machining Solutions to develop and test a real-time self-leveling system for their Large Diameter Facing Machine (LDFM). The LDFM is used to machine large diameter flanges (6'-18') for the oil, marine, and power industries. The goal of this project is to reduce overall machining tolerances from .015" to .005" using a laser measurement system and a custom designed control loop.



Locomotive Onsite Communication Initiative Loci Automation

Members:

Ronald Biron, Stephanie Peck, Niels-Erik Ravn, and David Vikken

Faculty Advisor:

Dr. Joe Moening

Company: Essar Steel Algoma, Inc.

Industrial Contacts:

Mr. Denis Cesarin
Mr. David Clingen

Presentation: 2 pm | CAS 123
Demonstration: 2:30 pm | CAS 125

Team Locomotive Onsite Communication Initiative (LOCI) has thoroughly tested a radar based position sensor to be implemented in a proximity warning system for the locomotives (loci) used in the coke making process at Essar Steel Algoma Inc. The primary goal of this project was to determine if the position sensor could operate through steam, snow, ice, as well as under other harsh environmental conditions. This project is phase one of a longer term project of completely automating the loci.



Marine Refueling Concepts Liquefied Natural Gas Bunkering Barge

Members:

Robert Klein, Steven Krentz, Tyler Pavelich, Michael Richardson, and Spencer Thomas

Faculty Advisor:

Dr. Robert Hildebrand

Company: Moran Iron Works, Inc.

Industrial Contact: Mr. Victor Ruppert

Presentation: 1:30 pm | CAS 212
Demonstration: 2 pm | CAS 120

Team Marine Refueling Concepts (MRC) conducted a feasibility study and conceptual design of an LNG (liquefied natural gas) bunkering barge, for Moran Iron Works of Onaway, which would refuel an anticipated fleet of Great Lakes vessels operating on LNG fuel. Design efforts focused on economic scaling of the barge, layout of refueling tanks and equipment, and capsizing stability in Great Lakes waves, allowing for LNG sloshing in tanks, the latter phenomenon studied by simulation and wave tank experiments.



Railway Automation Solutions

Robotics Fluid Dispensing with Machine Vision

Members:

Kevin Danhof, Randy Gee, Taylor Heath, Karl Larsen, and Levi Marchetti

Faculty Advisor:

Jon Coullard

Company: Pre-tec

Industrial Contact:

Mr. Jeff Johnston

Presentation: 1:30 pm | CAS 123
Demonstration: 2 pm | CAS 124

Team Railway Automation Solutions (RAS) designed and implemented a robotics workcell to simulate the dispensing of Spikefast, a wood filler product, into railroad ties. A Motoman robot, using custom end of arm tooling and a machine vision system, locates the positions of spike holes on railroad ties as they move by on a continuous conveyor. This project serves as a proof of concept for future development of a wood product dispensing system in the railroad industry.

Solar Film Innovations



Solar Film Innovations Window-Based Photovoltaic Systems

Members:

Greg Balcom, Victor Duffrin, Brandyn Everest, Mitchell Paradis, Apurv Shanker, and Randi Sims (co-op student, fall 2013)

Faculty Advisors:

Dr. Jaskirat Sodhi
Dr. Paul Weber

Companies:

3M, Little Traverse Conservancy

Industrial Contacts:

Mr. Tim Hebrink
Mr. Charles Dawley

Presentation: 3 pm | CAS 212
Demonstration: 3:30 pm | CAS 212

Team SFI designed and built two window-based solar systems, utilizing 3M Brand Prestige Series Window Film to reflect near infrared light onto photovoltaic cells. This not only allows for increased power output, but also provides room temperature and shading control while allowing visible light through the window. The first system is an improvement on a previous senior project, and replaces an entire window. The second system is a new design, which replaces window-mounted blinds.



Industrial Technology Directed Senior Project

Member: Brian Horn

Faculty Advisor: Jeff King

Customer: LSSU

Industrial Contact: Dr. Joe Moening

Presentation: 3:30 pm | CAS 123

Demonstration: 4 pm | CAS 125

This project updates lab equipment (Part Checker) for the EGRS365 course to use a current generation Allen-Bradley PLC and HMI. Determining hardware, ordering and implementation of the hardware, and testing the updated equipment are required for completion of the project.



ENGINEERING HOUSE

Faculty Advisors:

Dr. Joe Moening
Dr. Jaskirat Sodhi

Presentation: 2:30 pm | CAS 212

Demonstration: 3 pm | CAS 310

The Engineering Living Learning Community (Engineering House) designed and built a 3D printer at a significantly lower cost than LSSU's current 3D printer. The new device will be used to print souvenirs for Robotics summer camps. Many avenues were explored to reduce the component cost as well as the operating costs. Off-the-shelf components were used where possible, with remaining components machined by the students.

Welcome to the School of Engineering & Technology

■ 1:30 p.m.

Presentations:
CASET 123 Team RAS
CASET 212 Team MRC

■ 2:00 p.m.

Presentations:
CASET 123 Team LOCI
CASET 212 Team ABI

Demonstrations:
CASET 120 Team MR C
CASET 124 Team RAS

■ 2:30 p.m.

Presentations:
CASET 123 Team A-VIS
CASET 212 Engineering House

Demonstrations:
CASET 106C Team ABI
CASET 125 Team LOCI

■ 3:00 p.m.

Presentations:
CASET 123 Team LCS
CASET 212 Team SFI

Demonstrations:
CASET 310 Engineering House
CASET 125 A-VIS

■ 3:30 p.m.

Presentations:
CASET 123 Brian Horn

Demonstrations:
CASET 212 Team SFI
SmartZone Team LCS
The SmartZone building is located at 2345 Meridian Street

■ 4:00 p.m.

Demonstration:
CASET 125 Brian Horn

Students will be available throughout the afternoon for informal demonstrations and questions.
The Engineering Living Learning Community House (Chippewa Hall) will be open for tours.

2013-14 Senior Projects Faculty Board Members

This group serves as advisors, overseers, and guides to help the teams through their overall process:
Jim Devaprasad (chair), David Baumann, Jon Coullard, Robert Hildebrand, Jeff King, David McDonald, Joe Moening, Jaskirat Sodhi, and Paul Weber

Special thanks to Eric Becks, Laura Bofinger, David Leach, and Jeanne Shibley

The School of Engineering & Technology comprises the following disciplines:

- Computer Engineering
- Electrical Engineering
- Electrical Engineering Technology
- Industrial Technology
- Manufacturing Engineering Technology
- Mechanical Engineering

All of the Lake Superior State University senior engineering and engineering technology bachelor's students are required to complete a challenging senior design project. The students work in multidisciplinary teams and use a composite of their technical and general education courses to successfully complete these projects.

The intention of the senior design project is to provide valuable engineering experience that will help students transition from academia to industry or graduate school. Each project requires a detailed technical engineering analysis, development and follow-through to provide a realistic experience for our graduates.

For more information about LSSU's School of Engineering & Technology
www.lssu.edu/eng or 906-635-2207



The School of Engineering & Technology

presents the

Class of 2014 Senior Design Project Presentations & Demonstrations



Friday • May 2, 2014
1:30 p.m. - 5:00 p.m.

in the

**Center for Applied Science and
Engineering Technology**