FERRIS STATE UNIVERSITY

College of Engineering Technology

ELECTRICAL/ELECTRONICS ENGINEERING TECHNOLOGY

AND

COMPUTER NETWORKS AND SYSTEMS

SENIOR DESIGN PROJECTS PRESENTATIONS

APRIL 24, 2015

Welcome!

Welcome to the 24th annual Senior Projects Presentations of the Computer Networks and Systems and Electrical/Electronics Engineering Technology Department. We are pleased to welcome parents, prospective employers, students, prospective students, alumni, faculty, staff, and our industrial advisors. Without the support of all of you, today's presentations would not be possible.

This process started in the fall semester of 2014 when these students took our EEET-418 Project Management course. In this course they learned the theory and techniques of managing small and large scale projects. In the spring of this year in EEET-428, they undertook the task of creating, designing, developing, building, and testing their project. Working together as a team they developed a schedule, assigned tasks, and monitored the progress of their project. Today is the culmination of their efforts. Please enjoy the presentations and the results of our student's efforts.

"It isn't all over; everything has not been invented; the human adventure is just beginning."

— Gene Roddenberry

Thank you all for coming today,

Ron Mehringer, Professor

PRESENTATION SCHEDULE

8:30	KEYNOTE SPEAKER – *Michael Smith, Kendall Group*	12:00	LUNCH
9:00	Cellular Activated Power Strip	1:00	Autono-Mine
9:30	Automated Classroom and Lab Monitoring System	1:30	Bluetooth Trailer Lights
10:00	Moto Inertial Control System	2:00	Body Motion Charger
10:30	Room Scheduling Interface Appliance	2:30	Boundary Alert
11:00	MeterMaid	3:00	Home Energy Monitoring System
11:30	Special Presentations	3:30	Closing Presentations

CELLULAR ACTIVATED POWER STRIP (CAPS)

Advisor: Gary Todd

The purpose of the Cellular Activated Power Strip (CAPS) is to control the power to a device via text messaging. Once the CAPS receives the activation command, it will activate the switch that powers any device that is connected to it. Once the switch is activated, the CAPS will then send back a confirmation text telling the user that the device has been turned on. After a set amount of time, the CAPS will automatically deactivate the device.

Skylar Fersch was born in Calgary, Alberta, Canada, and moved to the USA at the age of 10. He graduated from Manton Consolidated High School in 2010. He is working on a Bachelor's in Electrical/Electronics Engineering Technology at Ferris State University.

Cody Lockman is from Wyoming, Michigan, and graduated from Godwin Heights High School. Cody is a senior in the Electrical/Electronics Engineering Technology Program at Ferris State University. He enjoys playing with cars, hanging with friends and family, and hunting and fishing.

Tommy Reed was born in Libertyville, Illinois. He graduated from high school at Oakridge Public Schools. He is working on a Bachelor of Science degree in Electrical/Electronics Engineering Technology at Ferris State University and plans to graduate in fall of 2015. His interests are playing airsoft, riding motorcycles, and video games.

AUTOMATED CLASSROOM AND LAB MONITORING SYSTEM (ACALMS)

Advisor: Debbie Dawson

The Automated Classroom and Lab Monitoring System (ACALMS) is an idea that was created out of the desire to improve current attendance practices and laboratory availability at the College of Engineering Technology (CET) on the main campus of Ferris State University (FSU). The purpose of ACALMS is to streamline and improve the attendance and lab monitoring systems. The core components of the ACALM System are a short range Radio Frequency Identification (RFID) receiver attached to a microprocessor/controller. These components interface with a dedicated internal database to determine access level for students and track attendance.

Marc Mancini was born in Oakville, Ontario in Canada where he graduated from Humber College of Technology's Electrical Engineering and Control Systems Diploma program with honors. Currently, he is a senior in the Electrical/Electronics Engineering Technology program at Ferris State University with a 3.8 GPA. In his spare time, Marc enjoys building and tinkering with computers, listening to music, and playing video games. He had his internship at Symtech Innovations where he had worked on AutoCAD schematics of building electrical systems. Marc wants to find a career in electrical engineering with the latest technology back in Canada.

Michael Anthony Rigoulot was born in Fort Lauderdale, Florida. He moved to Michigan when he was young and played varsity sports in high school and graduated from Pinckney Community High School. After high school, he started college at Washtenaw Community College where he received his first degree. Then he transferred to Ferris State University to work toward a Bachelor in Electrical/Electronics Engineering Technology. In his spare time, he enjoys all sports, video games, and working with computers as well as other electronics. He is currently finishing his degree and hopes to find a job in his field.

Scott Wehrle is an Electrical/Electronics Engineering Technology major and holds an Associate's degree in Industrial Electronics Engineering Technology from Ferris State University. He also holds two Associate degrees from Alpena Community College in the fields of Utility Technology and Electrical Maintenance Technology. Scott is the proud father of two beautiful daughters (7 & 15) as well as a 1 year old baby boy. He works as a Controls Engineer for Logic Plus in Reed City, Michigan.

MOTO INERTIAL CONTROL SYSTEM (MICS)

Advisor: Steve Johnson

MICS is an embedded control system that automates a motorcycle's turn signal system. This automated system is designed to help keep motorcycle riders from forgetting to deactivate a turn signal. An inertial measurement unit calculates the roll angle (tilt) of the motorcycle during a turn, and a control system determines when the turn is complete. After a turn is complete, the control system deactivates the turn signal. With MICS, a motorcycle rider no longer has to remember to deactivate a turn signal.

Alex Arent is a senior in Ferris State University's Electrical/Electronics Engineering Technology program. At an early age, Alex became curious about how TVs, radios and other electronics worked and enjoyed spending countless hours tearing them all apart. This curiosity led Alex to pursue a degree in Engineering/Electronics Technology. When not in school, Alex loves being outdoors. Some of his favorite outdoor hobbies are fishing, mountain biking, and kayaking.

David Hearn was born and raised in Grand Rapids, MI. After graduating from Jenison Public High School in 2009, he attended Grand Rapids Community College to determine his career path. After graduating from GRCC in 2012, he transferred to Ferris State University. David is currently a senior in the Electrical/Electronics Engineering Technology program and is also earning a minor in Mathematics. In his free time, he enjoys playing guitar, woodworking, motorcycles and the outdoors.

Irnes Konjaric was born in Bosnia and Herzegovina. He moved to the USA 15 years ago with his family. The main reason his family moved to the USA was to pursue better opportunities in life and education. Irnes is a senior in the Electrical/Electronics Engineering Technology (EEET) program and has an Associate Degree in Industrial Electronics Technology. In his free time, he enjoys being active, taking motorcycle trips, and expanding his knowledge of technology.

ROOM SCHEDULING INTERFACE APPLIANCE (RSIA)

Advisor: Robert Most

The purpose of this project was to create a small display to place on the outside entrance to a conference room that provides the scheduling information for the room. The Room Scheduling Interface Appliance (RSIA) has the ability to schedule a meeting in the room via scanning the employees ID badge which can be either RFID or barcode technologies. Microsoft Exchange Calendaring and Resources will be used to keep track of the scheduling information. By providing scheduling from the room, RSIA gives employees flexibility and mobility. This device is programmed with Monodeveloper, using C# and the GTK# library. The project runs on a Raspberry Pi B+ board with an attached LCD touch screen display, camera, and RFID reader.

Cody Clark grew up in Lowell, Michigan, and graduated from Lowell High School. He also graduated from Kent Career Technical Center's Information Technology program during his junior and senior year of high school. Cody currently works for the Enterprise Applications and Services Department for Ferris State University as an Active Directory and Office 365 administrator. He is graduating from Ferris State University with a Bachelor of Science degree in Computer Networks and Systems and a minor in Computer Science.

Brandon Scott grew up in Niles, Michigan, and graduated from Brandywine High School in 2010. He is currently a senior at Ferris State University, pursuing a Bachelor of Science degree in Computer Networks and Systems, while also pursuing a minor in Computer Science. In 2013, Brandon earned his CCNA certification and plans to continue the certification trail past graduation. He was the vice president of the Institute of Electrical and Electronics Engineers (IEEE) chapter at Ferris in 2014. Since May, 2014, Brandon is a part-time Information Systems Intern at Pridgeon and Clay in Grand Rapids, MI.

John Snider grew up in Mecosta, Michigan, and graduated from Chippewa Hills Public Schools. He works for Big Rapids Public School District as the Assistant Technology Director. He was married in 2013 to Angela Clementshaw and is a new father. He intends to graduate Ferris with a Bachelor's degree in Computer Networks and Systems.

Craig Watz is a senior dual majoring in Electrical/Electronics Engineering Technology and Computer Networks and Systems programs. He has an Associate degree in Mechanical Engineering Technology. Craig grew up in Bay City, Michigan, and graduated from Garber High School. He was the president of the Institute of Electrical and Electronics Engineers (IEEE) chapter at Ferris in 2014 and the Secretary of IEEE in 2013. He has recently interned at Quicken Loans in Detroit, MI as a Data Center intern. He is currently the Student Manager/Audio Visual Coordinator at Ferris State's University Center. Craig enjoys riding his motorcycle and spending time with friends.

METERMAID
Advisor: Jeff Pedelty

MeterMaid is a convenient parking meter system for both the customer and parking officials. This parking meter system is able to detect a vehicle in a parking location and cross references this with payment information to determine a parking violation. A warning message can be sent to the customer when a violation is about to occur using information entered during the payment process. This allows the customer to use the web-based payment method to remotely add more time as needed. When a parking location is in violation, a notification is sent to parking officials to handle at their discretion.

Adnan Althbyty was born in Saudi Arabia. He is a senior in the Electrical/Electronics Engineering Technology program at Ferris State University and plans on graduating in the spring of 2015. He received his Associate Degree in Industrial Engineering Technology from the College of Engineering Technology. Adnan has worked at different companies such as Sasakura and Femco. Before he came to the United States, he worked as a Precision Instrument Technician at the Saline Water Conversion Corporation Company (SWCC). In his free, time he enjoys working out and reading.
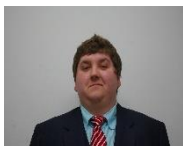
Michael J. Gerritsen is a Computer Networks and Systems (CNS) senior from Lapeer, Michigan. He graduated from Lapeer West High School and, inspired by his family, pursued a Bachelor of Science degree in CNS. Upon graduation, he is looking forward to a long career in the computer networking and related industries.

Travis Nederhood is an Electrical/Electronics Engineering Technology (EEET) student with a strong emphasis in industrial controls. Travis grew up in McBain, MI where his interest in electronics began with tearing apart his first Walkman and reconstructing it. He is scheduled to graduate with a Bachelor's degree in EEET from Ferris State University in the fall of 2015. In his free time, Travis enjoys guiding white water rafts and mountain tours, as well as staying current with the latest in wilderness medicine.

Brian A. Welch is pursuing his Bachelor's Degrees in both Computer Networks & Systems and Electrical/Electronics Engineering Technology. He is from South Boardman, MI, and graduated from Forest Area High School as Salutatorian in 2009. Brian has worked in oil & gas drilling as a shop-hand and rig-hand since he has been old enough to work. He also completed an internship this past summer in the IT Department of Acrisure in Caledonia, MI. He will return to Ferris State University this fall to complete his EEET degree.

# AUTONO-MINE
Advisor: Robert Most

The purpose of this project is to create an autonomous vehicle that can be used in hazardous conditions such as land mine detection. This project will serve as a cheaper solution for removing land mines in a combat setting. The Autono-Mine mine eliminator will maneuver around obstacles without running into them by using ultra-sonic sensors. The microprocessor chip that is used in this project is the "Light Blue Bean" by Punchtrough. It is used for controlling the car and also for monitoring the sensors. To detect a land mine, three inductive proximity sensors are mounted in the vehicle.

Jim Froehlich was born in Detroit, Michigan, and graduated from Fraser High School. He is a senior in the Electrical/Electronics Engineering Technology program at Ferris State University and plans on graduating this spring 2015. Jim has received a job at Logic Plus in Reed City as a controls engineer. He enjoys tinkering on his trucks and playing sports.

Travis Stevens graduated from Pinckney Community High School in 2011. While in high school, Travis was in the Robotics Program for four years and competed twice nationally in the Skills USA Robotics Competition. After graduation, he immediately started in the Electrical/ Electronics Engineering Technology program at Ferris State University. In his free time, Travis likes hunting, fishing, and inventing.
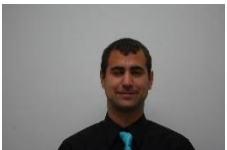
Dylan Thelen is from Dewitt, Michigan, and graduated from St. Johns High School in 2011. Dylan is a senior in the Electrical/Electronics Engineering Technology program at Ferris State University. He enjoys keeping up with the latest gadgets, hunting, tubing, playing disc golf, and video games. Dylan recently accepted a position at Gentex Corporation in Holland, MI.

BLUETOOTH TRAILER LIGHTS
Advisor: Gary Todd

The purpose of this project is to replace the wires between the main vehicle and the lights on an attached trailer. The unit will also allow the lights to be easily moved to different trailers. The main controller will be connected to the trailer electrical port on the towing vehicle. Each taillight will be powered by a battery and solar panel. The main controller and taillights will be connected by a wireless Bluetooth.

Ahmad Alghamdi is an Electrical/Electronics Engineering Technology (EEET) student who enjoys spending his free time working on cars, repairing computers and operating systems. He is from Saudi Arabia where he earned an Associate's Degree in Industrial Electronics and Control from Riyadh College of Technology in 2008. He is enthusiastic to work on and learn more about electronic devices while working toward his Bachelor's degree.

Ahmad Alotaibi is a Computer Networks and Systems (CNS) student in his senior year at Ferris State University. He was born in Jeddah, Saudi Arabia and has lived in various countries. Ahmad loves modifying the structure of PC applications for specific purposes. He also likes to troubleshoot and fix devices including hardware or software. He is eager to expand his knowledge and build his experience in his chosen field of study at Ferris State University. Therefore, he will pursue an advanced degree in a computer-related major in the near future.

Ryan Ritter is a senior in the Electrical/Electronics Engineering Technology program. He received his Associates from Grand Rapids Community College before transferring to Ferris State University. He completed his internship at Complete Automation Resource and plans to graduate fall 2015 with a Bachelor of Science Degree.

BODY MOTION CHARGER

Advisor: Murry Stocking

The purpose of this project is to capture unused energy and convert it to positive and useful energy. This device can be used to charge a phone battery or a backup battery. This device is worn by the user and uses the movement of the leg while walking. As the user's leg moves, the device will generate power to charge a battery. A small linear generator uses springs and a cylindrical magnet that moves forward and backward as the user's leg moves. This device has a backup battery, so that, even if the user doesn't have a device connected to the charger, it will charge the backup battery. The user can use the backup battery to power the phone even when there is no movement.

Abdulrahman Alshammari was born in Hafr Albatin, Saudi Arabia and has been in the United States for three and a half years. He is hardworking and enjoys successfully completing a difficult task. He received his Associate Degree from Hafr Albatin Community College in Saudi Arabia. He came to the United States to complete his education and earn a Bachelor of Science degree. He worked for one year with Maaden Phosphate Company in 2010. His favorite sports are playing soccer, swimming, and travelling. He will be graduating in the spring of 2015.

Mohammed Alshammari is from Saudi Arabia. He is a senior student earning a Bachelor Science Degree in Electrical/Electronics Engineering Technology. He received his associate degree from HBCC/KFUPM in Saudi Arabia in 2010. Mohammed has a full scholarship from his government and has attended Ferris since 2012. Mohammed is the president of Saudi Students Organization at Ferris State University and is working with the international office at Ferris State University as a student ambassador. He likes watching soccer games and enjoys spending his free time with friends, playing cards, watching movies, and using his computer. Mohammed has 8 siblings.
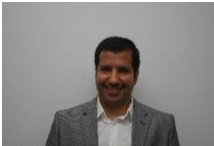
Mubarak Alshammari is from Saudi Arabia. He is studying Electrical/Electronics Engineering Technology (EEET) at Ferris State University. He chose that major because he loves mathematics and physics. He has an Associate Degree from King Fahd University of Petroleum and Minerals with the same major. He did his internship at SABIC Company, which is one of the biggest companies producing petrochemicals in the world. His job was to solve product development and maintenance issues. This is his last semester at Ferris and he will graduate in May. He is a member of the Muslim Student Organization.

Sultan Alshammari is from Saudi Arabia. Smart and kind is how his family describes his personality. He is a social person, and he always likes to make friends from different nationalities. He has a diploma from King Fahad University for an Electrical and Electronic Engineering Technology. He was a technician at Ma'aden Phosphate Company for two years with experience in field work, especially power and control engineering. He excels in Math and Physics and is a professional technical writer with different styles of writing reports. He is an athletic person and his favorite sport is soccer. He has been at Ferris since the fall 2012 semester and will graduate in spring of 2015 with a Bachelor of Science Degree in Electrical/Electronics Engineering Technology.

BOUNDARY ALERT
Advisor: Steve Johnson

The purpose of this project is to create a hardware device that has the ability to track a person or object via GPS location. This will be very useful for any person that requires close monitoring. People needing to be tracked can simply wear the device that is battery powered and, at any point in any location, the person wearing the device can be found using a cellphone. This device can also be used to alert the user when the device moves out of boundaries that were set up by the user. A notification will appear on the user's cellphone with the current location of the device.

Trent Garland was born in West Branch, Michigan, and graduated from Ogemaw Heights High School. He is a senior in the Electrical/Electronics Engineering Technology Program at Ferris State University. In his spare time, Trent enjoys experimenting with the latest technologies along with playing video games and bowling. He recently interned at Firstronic LLC in Grand Rapids, Michigan, as a Wave Technician.

Daniel Pawlak was born in Troy, Michigan, and graduated from Troy Athens High School. He is a senior in Electrical/Electronics Engineering Technology (EEET) at Ferris State University. During Daniel's free time, he enjoys being in his shop where he makes boxes and bowls out of wood. When he is not in his shop, he is playing golf or prototyping electronics. Daniel is currently seeking an internship and job opportunities in the Industrial Automation Controls field.

Zach Weaver is a senior in the Electrical/Electronics Engineering Technology program. He graduated from Grand Haven High School in 2010. During his free time he enjoys video games and other activities that include doing almost anything with his friends. He has held a position at GHSP in Grand Haven, Michigan, as a Test Lab Engineering Assistant.

HOME ENERGY MONITORING SYSTEM (HEMS)
Advisor: Warren Klope

The Home Energy Monitoring System (HEMS) is a convenient way to keep track of your heat and electrical usage and losses. This system provides feedback necessary for the homeowner to make energy efficient home repairs or upgrades. Once installed, HEMS will log temperature data and electrical usage data, which is uploaded to a database. HEMS will then display this information to the user via a webpage. This system is especially useful to homeowners attempting a cost benefit analysis for home enhancements.

Kyle Foster was born in Traverse City, Michigan. He is a returning student with an Associates in Maritime Technology from Great Lakes Maritime and a Bachelor of Science in Business Administration from Ferris State University. Before enrolling at Ferris State University, Kyle worked on Great Lakes bulk freighters for over six years in various positions ranging from third Assistant Engineer to first Assistant Engineer. Kyle is also an Engineering Superintendent at Grand River Navigation. He is currently working on his Bachelor of Science degree in Electrical/Electronics Engineering Technology with a focus on Industrial Automation.

Martin Kucharek was born in Gaylord, Michigan, and graduated from Gaylord High School in 2008. He is currently a senior in the Electrical/Electronics Engineering Technology program at Ferris State University and will graduate in December 2015. He enjoys fishing, outdoors and designing electrical circuits.

Eric Misiak was born in Bay City, Michigan, where he graduated from John Glenn High School. Eric is a senior in the Electrical/ Electronics Engineering Technology program and will graduate at the end of the Spring 2015 semester. His interests include playing music, building and fixing electric guitars and amplifiers, and designing simple circuitry. Eric works as an SLA Facilitator and tutor and loves helping out fellow students.

EET AND CNS FACULTY and STAFF
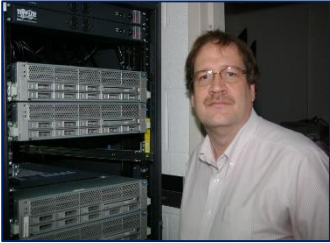
Steve Johnson

Sandy Kerridge

Warren Klope

Ron Mehringer

Bob Most

Jeff Pedelty

Murry Stocking

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Thank you for Coming!