



FERRIS STATE UNIVERSITY

College of Engineering Technology

COMPUTER NETWORKS AND SYSTEMS

&

ELECTRICAL/ELECTRONICS ENGINEERING TECHNOLOGY

SENIOR DESIGN PROJECTS PRESENTATIONS

APRIL 26, 2019



FERRIS STATE UNIVERSITY

IMAGINE MORE

Welcome to the 28th annual Senior Projects Presentations of the Computer Networks & Systems and Electrical/Electronics Engineering Technology programs.

These presentations represent the culmination of many hours of inspiration, design, construction, then troubleshooting, and redesign. Throughout this process the students have experienced many emotions from frustration to excitement as they got certain sections of their project working. Unfortunately the excitement diminished as they had to incorporate project management skills into their project. These skills include all the paperwork of developing a schedule, creating a budget, assigning tasks, and monitoring the progress.

Please enjoy the presentations today as the students share their excitement about their projects.

“I believe that education is all about being excited about something. Seeing passion and enthusiasm helps push an educational message.” - Steve Irwin

Thank you all for coming today,

Steve Johnson, Professor

PRESENTATIONS

- 1. YIELDING ELECTRICAL ENERGY TODAY.**
- 2. AUTOMATED AEROPONICS GREENHOUSE.**
- 3. AUTOMATED CAR STORAGE SYSTEM.**
- 4. CONNECTED CAFFEINATION CREW.**

YIELDING ELECTRICAL ENERGY TODAY

Advisor - Warren Klope

With the ever-increasing demand for green energy sources, more renewable energy sources are required. While there are many out there such as, air and hydro, energy is everywhere waiting to be harnessed, but using this energy to create electricity can prove difficult. Gravitational pull is one of the most common forces on this planet. People and countries throughout the world have begun harvesting this force to create electricity.

The goal of our project is to harness the gravitational pull between you and the ground to create a walking power supply. This can be done several ways. However, our original design will attempt to use piezo electronic crystals to generate 3 Watts of power (100mA and 30V) to charge a phone, and while the phone is not being charged, it will charge a bank of capacitors which will act as a battery.



Scott Leyder – is from Ewart, Michigan, graduated from Ewart High School in 1990. Scott is a Senior at Ferris State University majoring in the Electrical/Computer Networks and Systems (ECNS) program, with a minor in Information Security and Intelligence Networks (ISIN). Scott enjoys spending time with family and friends, helping to foster creativity and ingenuity in his four children, learning about masonry heating options for efficient heating sources and uses, outdoor activities, and general eclectic learning through life. Scott has an inner passion for inventing, updating, or repurposing things with the end goal of enhancing all our lives.



Calvin Meyer – “Opportunities are normally disguised as hard work, so most people do not recognize them” -Ann Landers. Most of the things in life worth having are not easy to obtain. I enjoy rolling up my sleeves and getting dirty. I am outgoing, and not afraid to take on problems or to ask questions. I consider myself more social then the stereotypical engineer, but you can always find me where the problem is because I enjoy solving them. I am not afraid to make mistakes because you learn more from then than anything else, but I love it when a plan comes together.



Cody Smith – is from Mayville, Michigan and graduated from Mayville High School. Cody is a senior in Computer Networks and Systems. At a young age, Cody started messing with computers and electronics. In High School Cody attended the Tuscola County Technology Center studying Computer Technology. During his time at Ferris, Cody has been a student computer technician and the film/ technology coordinator for the Ferris Football team. Cody enjoys tinkering with all types of electronics and computers at home. After graduating in May, Cody plans to work on becoming a Systems Administrator.

AUTOMATED AEROPONICS GREENHOUSE.

Advisor - Murry Stocking

The purpose of the Automated Aeroponics Greenhouse (AAG) is to automate and simplify an aeroponics system to grow plants inside of a greenhouse or indoors. Aeroponics is a very difficult but efficient and effective way to grow indoor plants. Using a collection of sensors, microcontrollers, pumps, valves, and piping AAG will streamline the challenging process of using an aeroponics system. Having sensors to track plant nutrition as well as the greenhouse environment will allow AAG to be customizable to different plant needs, which can be controlled, monitored, and adjusted via a touchscreen interface. The microcontrollers while also monitoring the sensors will control the watering system which can be the most cumbersome part of an aeroponics setup. This will allow the average gardener to grow plants either indoors or in a greenhouse using the difficult, but efficient method of aeroponics.



Zachary Andersen – is from Lakeview, Michigan and graduated from Lakeview High School. He holds an Associates Degree in Electrical Engineering Technology from Montcalm Community College and is currently a senior in the Electrical/Electronics Engineering Technology program at Ferris State University. He interned at Logic Plus in Reed City, Michigan and will continue to work there once he graduates. In his spare time, he enjoys outdoor activities such as fishing, camping, and golf.



Dillon Bisbee-Rainey – was born in Petoskey, Michigan, and grew up in Boyne City, Michigan. He has five younger brothers in which he tries to set a good example for. He graduated from Boyne City High School in 2011. After graduation, he worked in an automotive factory for the following four years. With inspiration from his Engineering Grandfather, he decided to attend Ferris State University to become an Electrical/Electronics Engineer. Currently, Dillon is a senior working towards a Bachelor's degree in Electrical/Electronics Engineering Technology. In his free time, he enjoys video games, music, and hanging with friends and family.



Abdulaziz Buhmail – is from Dammam, Saudi Arabia. In spring of 2019 shall complete my bachelor's degree in Electrical / Electronic Engineering Technology 'EEET' I previously worked at the multi-national oil company Saudi Aramco as instrument repairman in process control system unit form 2010 until 2014 at the Shadgum Gas plant. I loved my job but, I know higher Positions won't be acceded without a degree. I earned many safety awards and recognition letters one of the requisitions from Aramco CEO Amine Alnasser. I love playing / watching soccer, playing video games, and traveling.



Raphael Heaston – was born and raised in Pontiac, Michigan and graduated from Pontiac Academy for Excellence. He is currently a graduating senior at Ferris State University receiving a Bachelor of Science in Electrical/Electronics Engineering Technology. This past summer he had the opportunity to intern with FCA as an Electrical Controls Engineer. While in school he joined the coldest fraternity of them all Alpha Phi Alpha Fraternity Incorporated. During his free time, he enjoys playing video games, researching, and studying to increase his knowledge for his future career job.

AUTOMATED CAR STORAGE SYSTEM

Advisor - Gareth Todd

The purpose of the automated car storage system was to create a system that is a more efficient use of time and space than that of a stand parking structure. The system allows for cars to be stored in a smaller footprint by eliminating the need for large amounts of space between vehicles. It also adds a level of protection for the users storing their cars. This is done by limiting access to the vehicles stored in the system. The storage system uses primarily industrial controls, including Allen-Bradley PLC and HMI, Balluff IO-Link enabled IO, and miscellaneous industrial sensors.



Fahad Alrajeh – is an international student from Saudi Arabia. He was born in a cold winter evening on January 4, 1993. Fahad graduated high school from Saudi Academic in Rabat, Morocco in 2010. During early 2010 Fahad went to a trip with the school to a plastic factory and he was hooked by how the controlling process was in the factory. Fahad decided to continue his education in United States majoring in Electrical Engineering. He has been in the United States for five years. Fahad is going to graduate in the spring of 2019 with a Bachelor of Science Degree in Electrical Engineering Technology.



Ahmed Alshammari – Ahmed is a senior in the Electrical & Electronics Engineering Technology program and will be graduating in August 2019, after completing his internship. He is from Saudi Arabia. Ahmed is hard working and enjoys learning new skills. Ahmed’s concentration has been focused on Industrial Automation.



Mohammed Bumozah – is a senior in Electrical Electronics Engineering Technology program at Ferris State University. I am from Saudi Arabia. I moved to the US in 2013 to get my degree from here. Before moving Here I used to work as an electrician at one of the largest company in Saudi Arabia. During the process of getting my degree here I have worked on some projects and successfully had them done on time and scope. First project I have worked on was audio amplifier. The second one was automated cars garage storage. In summer 2018 I have worked for Tuff Automation as an electrician and I have worked on 2 projects first one was half way through when I started working there and the second one I worked on it from the beginning all the way to the end of it. During that time I have build a good experience on building conveyor systems.



Alex Poll – was born and raised in Grand Rapids, MI. He went to Grand Rapids Christian High School. He gained a passion for electrical/electronic work by growing up taking apart the broken generator components his dad would bring home. This led to graduating from Grand Rapids Community College with an associate degree in Electrical/Electronic Technology before pursuing his bachelor’s degree at Ferris State University. He currently works as a Controls Engineer for a local company, Tuff Automation. He enjoys spending his free time with his wife and pets as well as working on projects around the house.

CONNECTED CAFFEINATION CREW

Advisor - Robert Most

The purpose of the Engineer's Coffee Pot is to allow a user to control the coffee brewing process to a higher degree than what is available in standard coffee pots. By using a web interface, the user can control exactly how they want their coffee to be made, when they want it made, and have the process almost fully automated for them. A hopper on top of the device feeds exactly the amount of coffee grounds needed directly into the brewing basket, a water pump automatically fills the reservoir to the desired level, and the heating element is powered for as long as is requested. All of the components are controlled by an Amazon Web Services-integrated Raspberry Pi that relays instructions to a PIC microprocessor which interfaces directly with all the devices used in the brewing process.



Sean Gray – born and raised in Saginaw, Michigan, graduated from Carrollton High School and is currently a senior at Ferris State University graduating with a Bachelor's degree in Computer Networks and Systems. He also served as the President of the Ferris chapter of the Institute of Electrical and Electronics Engineers (IEEE) from 2017-2018. In his free time, Sean enjoys cooking, kayaking, camping, and other outdoor activities. Sean currently works as a Student System Administrator with the Ferris IT department, and plans to pursue Systems Administration as a career after graduation.



Jacob Hovey – is from Beal City, Michigan where he graduated from Beal City High School in 2015 while dual-enrolling at Mid-Michigan Community College. He is working on a Bachelor of Science degree in Electrical/Electronics Engineering Technology (EET) and plans to graduate in fall of 2019. He was the president of the Institute of Electrical and Electronics Engineers (IEEE) chapter at Ferris from 2017 to 2019. In the summer of 2017, he interned for Newport News Shipbuilding as an test engineering intern, and plans to work as an embedded systems engineer after graduation.



Jacob Leonard – graduated from Reed City High School in 2015 and plans on graduating from Ferris State University in the winter of 2019. He is majoring in Computer Networks & Systems and Electrical Engineering Technology. As a hobby, he enjoys experimenting with new technologies. Examples include: Amazon Web Services, Virtual Private Networking, Linux Operating Systems, Internet of Things, and coding in general. According to legends, he never leaves the Swan Technical Building, and drinks a pot of coffee per day. He plans on pursuing a career in industrial automation with an interest in industrial networking with ethernet.



Andrew Reyburn – is a graduate of the Computer Networking Engineering bachelor's degree, as well as the Electrical/Electronics Engineering degree. He has a strong passion for designing network systems, high level programming of microcontrollers and embedded systems, and connecting diverse systems to make communication happen. From a young age, beginning with connecting Macbook Duos via basic LAN communication, it was the exploration and optimization of networks that inspired him the most. He enjoys redesigning and creating new connected systems at home, involving everything from adblocking network filters to home network video streaming servers.

**EET/CNS
FACULTY AND STAFF**



**Gareth Todd, Professor
Program Coordinator**



**Jeff Pedelty
Equipment Technician**



**Steven Johnson
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**Warren Klope
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