



# FERRIS STATE UNIVERSITY

---

College of Engineering Technology

**COMPUTER NETWORKS AND SYSTEMS**

&

**ELECTRICAL/ELECTRONICS ENGINEERING TECHNOLOGY**

**SENIOR DESIGN PROJECTS PRESENTATIONS**

**APRIL 24, 2020**



# FERRIS STATE UNIVERSITY

*IMAGINE MORE*

Welcome to the 29th annual Senior Projects Presentations of the Computer Networks & Systems and Electrical/Electronics Engineering Technology programs at Ferris State University.

These presentations represent a small portion within the closing phase of Project management. Each student has progressed their project through the planning, executing, monitoring, and now are entering the closing phase. Each phase has involved many administrative duties from writing proposals; determining and handling risks, schedules, budgets, and change management; producing status reports, this presentation, and at the conclusion of this course delivering a final report.

Please enjoy the presentations today as each student highlights their particular discipline and skillset but please realize that there are many unseen aspects of these projects.

*“Management is, above all, a practice where art, science, and craft meet.” ~ Henry Mintzberg*

Thank you all for coming today,

Steve Johnson, Professor

## **PRESENTATIONS**

- 1. AUTOMATED WEATHER STATION**
- 2. PROJECT AUTOTUNE**
- 3. THE SMART RACK**
- 4. RECREATION AUTOMATION**

## **AUTOMATED WEATHER STATION**

The purpose of this project is to provide a way to gain an overview of the current weather conditions. The Automated Weather System (AWS) will also store previous weather conditions in a SQL server that can be accessed at any time via website. This project will incorporate a raspberry pi, Programmable Logic Controller (PLC), Human Machine Interface (HMI), multiple sensors, and a web server to run SQL on. The raspberry pi will take signals from each of the sensors and store the information in the SQL server while providing logical inputs to the PLC. The PLC will then do logical comparisons to determine the proper signal to be displayed based off the current weather conditions. The PLC will also reflect information and conditions from the National Weather Service Alert System.



**Dustin Childs** – was born in Fremont, Michigan, and graduated from Newaygo High School in 2014. He originally intended to get a degree in Radiography but realized that he wanted to do something not in the healthcare field and decided he would choose engineering. Now he is currently a senior in the Electrical/Electronics Engineering Technology (EET) program with a focus in Controls at Ferris State University and will graduate in May of 2020. Upon graduation he has accepted a job to work where he will be working in the Focused Improvement division to help identify losses and create programs to help visualize data to improve workflow. He is also in the 1436 Engineer Company out of Montague, Mi in the Michigan National Guard which he has been in since 2017. He enjoys programming, gaming on PC and PS4,



**Gerrit Lane** – Gerrit Lane is from Grand Rapids, MI, and graduated from Wellspring Preparatory High School in 2015. In his spare time, he likes to play video games, watch movies, and run a sound board for an RSO on campus. He currently works as a Technology Assistant at Big Rapids Public Schools where he also interned for a few different summers.



**Trenton LaVergne** – is from Lincoln, Michigan and is a 5th year senior in the Electrical/Electronic Engineering Technology Program here at Ferris State University. Before coming to Ferris State University, Trenton attended Alcona Community High School and Alpena Community College. Trenton is a hardworking student who strives to always do his best. Through all his schooling he holds an accumulative GPA of 3.8. In his free time, he enjoys playing all sports, video games, and simply being on a computer to get updates on the latest news in sports or anything else in the world. Trenton will graduate in May 2020 and plans to start his career in the automation industry

## PROJECT AUTOTUNE

The purpose of this project was to create a device that will make the process of tuning an electric violin much easier. All the user must do is select the cord they wish to tune and then play the violin. When the instrument is played, the device will compare the frequency of the violin to the frequency of the note the user selected. If the frequencies are different, the device will then turn the tuning knobs on the violin until the played note matches the desired note. This will help increase the precision by which the instrument can be tuned as well as make the tuning process much easier for beginners.



**Eric Braunz** – was born and raised near Grand Rapids, Michigan. After graduating from East Kentwood High School, he decided to pursue his talents with math and enter the engineering world. With his success in numerous AP courses from high school, Eric will be graduating a semester early next December. He is currently a junior. His passion for learning is always apparent, and it earned him the Student of the year award for the Industrial Electronics Technology program in 2019. He is always looking for ways to grow and improve, with whatever project he is working on.



**Nicholas Potgeter** – is from Cadillac Michigan and is currently a senior in Ferris' Electrical/Electronics Engineering Technology (EEET) program. Nicholas spent the past two and a half years teaching freshmen in the EEET program basic electronic circuits as a Structured Learning Assistance (SLA) Facilitator. Last year he participated in the National Collegiate Disc Golf Championships where Ferris sealed their third national title. His hobbies include basketball, disc golf, and working as an audio technician at his church.



**Nickolas Stratton** – grew up in McBride, Michigan and was valedictorian of his graduating class at Montabella High School in 2016. He earned his associate degree in Industrial Electronics Technology in 2019 and plans to graduate from Ferris State University with a bachelor's degree in Electrical/Electronics Engineering Technology in spring 2020. Nickolas completed an internship with Rexair in Cadillac, Michigan over the summer of 2019 and plans to return there after graduation for full-time employment.

## THE SMART RACK

The purpose of the smart server rack is to provide a server rack that can monitor itself and provide remote capabilities for the user while providing a mobile platform that is secure. This product is intended for use by entrepreneurs, small businesses, or any small-scale operation that needs their own data storage, website server, or any server ran service. Our product has the capability to monitor its internal heat and humidity giving the user awareness of its current state and being able to regulate its internal heat. We can maintain a lower price than our competitors using our small-scale approach.



**Ryan Daniel** – was born and raised in Mattawan, Michigan. He graduated from Mattawan High School in 2015. He shot skeet and sporting clays competitively as part of a scholastic league as well as participating in the school band. His interest in computers first began when a friend helped him to build his own computer. In his free time, he enjoys reading about new technology, playing and listening to music, and playing video games. He is a senior in the Electrical Computer Network System program and hopes to begin a career as a network or system administrator.





**Greg Doss** – was born in Wyandotte, MI and graduated from Riverview Community High school. He is a senior in Electrical & Electronics Engineering Technology, during his time at Ferris State University he has been apart of the club lacrosse team, Sigma Alpha Epsilon, and FIRST Robotics. During his free time, he likes to go outside usually going disc golfing, hiking, or tubing. He interned this past summer at Green Building Automation and is looking to start a career in industrial automation.

**Joshua Smith** – was born and raised in a small town in southern Michigan, Jonesville. After dual enrolling in high school and trying out the mechanical and welding fields, he decided to come to Ferris and eventually to pursue a B.S. degree in Computer Networks and Systems. Joshua is expected to graduate from Ferris May 2020. He completed his internship as a summer IT intern for a county government IT department. He worked on various projects under the IT director and was welcomed back the following winter to help complete more work. In his spare time, Josh enjoys golfing, hanging out with friends, and traveling to Las Vegas.

## RECREATION AUTOMATION

The purpose of this project is to implement an autonomous strike and ball zone simulator for the sport of baseball. Baseball is known as Americas past time and concern over the accuracy of the human eye in determining balls and strikes has been a controversial topic for quite some time now. Questionable calls have often cost teams wins, which is a big concern for not only the organizations with the coaches, players, and management but also with spectators of the sport. Implementing an autonomous strike zone will result in the elimination of this controversial topic. Using an autonomous strike zone can also help make umpires job a lot easier, as they can be more confident in there calls, and won't have to deal with the pressure of a heated manager/player or fan. Overall an autonomous strike zone can significantly help the accuracy of the game as we move forward with more technological advancements in culture.



**Paulina Cartes** – was born in Chile and moved to The USA 13 years ago. Paulina is a senior in the Electrical/Electronic program and has an Associate degree in Electronic Engineering Technology from Grand Rapid Community College where she also worked as a Chemistry, Calculus and Spanish tutor. In her spare time, she enjoys all outdoors activities.



**Thinkh Van** – was born in Danang, Vietnam. He moved to Grand Rapids, Michigan in 2013 and graduated from Grandville High School in 2014. He attended Grand Rapids Community College after that to determine the career path. He transferred to Ferris State University in 2017 to continue Electrical Engineer major. Thinkh is currently senior in the Electrical/Electronic Engineer Technology major. In the free time, he likes to read books, watch nature documentary, sing songs, and travel.



**Nick Vruggink** – was born and raised in Grand Rapids, Michigan and graduated from Grand Rapids Catholic Central in 2016. He earned his Associates in Applied Sciences Industrial Technology in the Fall of 2019 and plans to graduate this December with his Bachelors in Electrical/Electronics Engineering Technology. Nick plans on going into the industrial control industry. His interests are sports & hanging out with friends/family doing outdoor activities like fishing/hunting.

**EET/CNS  
FACULTY AND STAFF**



**Gareth Todd, Professor  
Program Coordinator**



**Jeff Pedelty  
Equipment Technician**



**Steven Johnson  
Professor**



**Warren Klope  
Director, Professor**



**Bob Most  
Professor**



**Murry Stocking  
Professor**