Jonas Wagner

Curriculum Vitae

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Education

Since August 2020 — **University of Texas at Dallas**
PhD Mechanical Engineering
Concentration: Dynamic Systems and Controls
Overall GPA: 3.78

Sept 2016 - May 2020 — **University of Wisconsin - Platteville**
B.S. Engineering Physics and B.S. Electrical Engineering
Emphasis: Control Systems, Minor: Mathematics
Overall GPA: 3.37

Sept 2012 - June 2016 — **Oshkosh West High School**
B.S. Engineering Physics and B.S. Electrical Engineering
Emphasis: Control Systems, Minor: Mathematics
Overall GPA: 3.6

Sept 2014 - May 2016 — **University of Wisconsin - Oshkosh**
CAPP and Youth Option, (Calculus 1,2,3, Physics 1,2 and Comp Math)

Teaching Experience

Fall 2021 — **Teaching Assistant - Introduction to Mechanical Engineering I**
Mechanical Engineering, University of Texas at Dallas
Professors: Dr. Oziel Rios and Dr. Dani Fadda
- TA for 4 sections totalling more then 200 students
- Instructed students in person on weekly labs and assignments
- Graded weekly deliverable and answered any grading related questions

Aug 2020 - May 2021 — **Teaching Assistant - Introduction to Mechanical Engineering I & II**
Mechanical Engineering, University of Texas at Dallas
Professors: Dr. Oziel Rios and Dr. Dani Fadda
- Managed discussion forums to answer student questions and provide supplementary instruction
- Graded weekly deliverable and answered any grading related questions
- Communicated with students via email and MS Teams to assist in assignment related questions

Spring 2020 — **Lab Assistant - Introduction to Automatic Controls**
Electrical and Computer Engineering, University of Wisconsin Platteville
Professor: Dr. Mehdi Roopaei
- Supervised and instructed junior and senior engineering students in control labs
- Transitioned DC-motor control labs into virtual Simulink-based labs (still used today)
- Provided students with video lectures for completing lab assignments virtually

Fall 2019 **Lab Assistant - Introduction to Engineering Projects**
Electrical and Computer Engineering, University of Wisconsin Platteville
Professor: Dr. Mehdi Roopaei
- Assisted in teaching first year undergraduate students through the Electrical Engineering Module
- Guided students through a lab performing simple analysis and testing of amplifier circuits

December 2019 **Guest Lecturer - FEA Automation Workshop**
Engineering Physics, University of Wisconsin Platteville
Professor: Dr. Gokul Gopalakrishnan
- Hosted a workshop for senior engineering students for automating FEA testing using ANSYS workbench

July 2019 **Student Assistant - Online Course Development**
Center for Distance Learning, University of Wisconsin Platteville
Professor: Dr. Mehdi Roopaei
Assisted in the development of course materials for the online graduate course:
Engineering 7310 - Control Systems Engineering I

Fall 2016 - Spring 2020 **Robot Design and Controls Mentor**
FIRST Robotics Competition Team 171, Platteville,WI
- Mentor High School students to design, built, and control robots for competition
- Teach fundamental math and physics concepts while inspiring students to pursue STEM careers
- Facilitate the logistics of traveling for competition and outreach events
- Restructured the club administration to allow expansion of the organization to additional STEM programs throughout the area K-12 education system

Computer Skills

Programming Experience

Basic C/C++/C#, Mathematica

Proficient Linux, Git, LaTeX

Advanced Python, numpy, matplotlib, MATLAB, Simulink

Engineering Tools

Proficient AutoCAD, ANSYS Workbench, Solidworks, Autodesk Inventor

Teaching Tools

Proficient Adobe Photoshop and Premier Pro, OBS Studio

Advanced eLearning/Blackboard, MS Outlook/Word/Excel/Teams/PowerPoint/OneNote

Relevant Coursework

Fall 2021 Engineering Optimization · Elementary Analysis I

Spring 2021 Nonlinear Systems · Convex Optimization · Dynamics of Complex Networks and Systems

Fall 2020 Linear Systems · Optimal Estimation & Kalman Filters · Probability & Random Variables

Spring 2020 Digital Signal Processing · Measurements and Instrumentation · Senior Design

Fall 2019 Discrete Time Controls · Electric and Magnetic Fields

Spring 2019 Modern Control Systems · Engineering Physics Sensors Lab · Analog Electronics

Fall 2018 Automatic Controls · Logic and Digital Design · Applied Mechanics

Spring 2018 Signals and Systems · Engineering Computation · Applied Optics

Awards

Spring 2021	UTD Mechanical Engineering - Outstanding Contributions to Undergraduate Education
Fall 2019	Undergraduate Research, Scholastic and Creative Activity (URSCA) Scholarship
Spring 2019	UW Platteville Protorype Hackathon - 3rd Place
Spring 2019	Foxconn Smart Cities Smart Futures Competition - Winner (Round 1 & 2) Honorable Mention (Round 3)
Spring 2019	Undergraduate Research, Scholastic and Creative Activity (URSCA) Scholarship

Publications

J. Wagner and M. Roopaei (2020). "Edge Based Decision Making in Disaster Response Systems". In: *IEEE - 10th Annual Computing and Communications Workshop and Conference*.

A. Fowler, E. Mutschelknaus, M. Roopaei, and **J. Wagner** (2019). "Learning in The Virtual Realm: A Platform for Immersive Engineering Education". In: *International Journal of Advances in Electronics and Computer Science (IJAECS)*.

Presentations

Development of a Real-time Object Detection Platform for UAVs (2019). UW-Plattevielle PSSPL and UT-Dallas CRSS Lab Seminar.

Modeling of Silicon Nanomembrane Pressure Sensors (2019). UW-Plattevielle PSSPL and UT-Dallas CRSS Lab Seminar.

Research-Focused Summer: A summary of a productive and eventful summer of research (2019). UW Platteville Engineering Research Seminar.

Improving Disaster Response with a Network of Unmanned Aerial Vehicles (2019). UW-Platteville Prototype Hackathon.

Posters

J. Wagner, D. Kelm, C. Shackett, N. Hemenway, and G. Gopalakrishnan (July 2019). *A Comparison of Modeling Methods for Silicon Nanomembrane Pressure Sensors*. Wisconsin Science and Technology Symposium.

J. Wagner and M. Roopaei (May 2019). *Computer Vision at the Edge with Jetson Nano*. Department of Engineering Physics Poster Session.

J. Wagner and M. Roopaei (April 2019). *Use of Multi-Agent Networks for Disaster Response*. University of Wisconsin System Symposium.

D. Kelm, **J. Wagner**, C. Shackett, N. Hemenway, and G. Gopalakrishnan (April 2019). *Modeling the Behavior of Silicon Nanomembranes in MEMS Sensors*. University of Wisconsin System Symposium.

A. Drees, **J. Wagner**, B. Thronson, N. Shannon, D. Rohr, B. Wisinski, A. Heuermann and G. Gopalakrishnan (January 2019). *Shape Based Separation and Manipulation of Micro and Nanoscale Objects*. Regional Materials and Manufacturing Network Conference.

Undergraduate Research Experience

Fall 2018 - Spring 2020

Projects Involving Machine Learning and Virtual Reality
Electrical and Computer Engineering, University of Wisconsin - Platteville
Advisor: Dr. Mehdi Roopaei

Disaster Response Applications (ML, Edge Analytics, and VR)
- Wrote several grant proposals (approx. $15 K awarded) that funded research into the use of ML and edge analytics within a multi-agent framework for disaster response
- Developed a virtual framework to develop and test an object detection algorithm
- Working on training a neural network using the Darknet framework to perform object detection on a custom database
- Submitted a manuscript detailing this virtual framework to the IEEE 10th Annual Computing and Communication Workshop and Conference

Computer Vision at the Edge on a Jetson Nano
- Explored the Jetson Nano Platform and worked within a Linux environment
- Used existing tools to connect a CSI camera and detect faces using Haar classifiers

Applying VR to Education
- Assisted in the preliminary development of a VR framework for distance education
- Assisted other students in creating a dynamic system visualization platform to provide students with an interactive environment to understand dynamic system modeling

Exploring Unity ML Agents
- Worked with Unity ML Agents to learn about ML and reinforcement learning methods
- Used pre-trained ML models and explored how well agents could perform the same objective in modified virtual environments

Spring 2019 - Spring 2020

Implementing K-Means and EM-Algorithm in MATLAB and Python
Electrical and Computer Engineering, University of Wisconsin - Platteville
Advisor: Dr. Hynek Boril

Learned about fundamental statistical modeling and ML techniques while also learning Python
- Implemented K-means Clustering and the EM-Algorithm to statistically model data
- Used Windows Subsystem for Linux and Midnight Commander to run Python naively

Fall 2018 - Summer 2020

Computational Analysis of MEMS Pressure Sensors
Engineering Physics, University of Wisconsin - Platteville
Advisor: Dr. Gokul Gopalakrishnan

Evaluated the limitations of different methods used for modeling the behavior of silicon nanomembranes for MEMS pressure sensing applications
- Focused primarily on automating the computation and analysis process
- Used ANSYS Workbench to perform FEM analysis on single crystalline silicon membranes under uniform pressure
- Used Python (NumPy and pandas) to automate data analysis
- Created plots to visualize data with matplotlib

June 2019

LabVIEW Programming of a Mobile Robot
Mechanical Engineering, University of the West of Scotland - Paisley
Advisor: Dr. Luc Rolland

Short-term study abroad research trip: Worked on developing a control algorithm for a sbRIO controlled robot that avoids obstacles and maps an environment autonomously

Graduate Research Experience

Summer 2020 - Present

Cyber Physical System Security - Theory, Simulation, and Implementation
Mechanical Engineering, The University of Texas at Dallas
Advisor: Dr. Justin Ruths

System Uncertainty within CPS Security Theory
- Working with LPV and Polytopic systems to expand security theory to more realistic systems

Simulation of Cyber-Physical Systems
- Developing Simulations of varying levels of complexity to model CPS and test theory

Physical Testbed Implementation of CPS Security Theory
- Developing a physical CPS testbed using industrial Emerson DeltaV PKController DCS

Industry Experience

May 2018 - Aug 2018

Summer Employee - Blown Film Department
Bemis Converter Films, Oshkosh, WI
- Helped operators of Blown Film Machines during 12-hour shifts
- Operated forklift to transport supplies and waste
- Filed reports to insure quality and accuracy of film composition

May 2017 - Aug 2017

Summer Employee - Press Department
Bemis Specialty Films, Oshkosh, WI
- Assisted in mounting for flexographic printing presses
- Operated Tug to transport flexographic press cylinders
- Organized mounting priorities for 12 machines during 12-hour shifts

Recent Volunteer Activities

Fall 2016 - Spring 2020

Robot Design and Controls Mentor
FIRST Robotics Competition Team 171, Platteville,WI
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- Restructured the club administration to allow expansion of the organization to additional STEM programs throughout the area K-12 education system

Dec. 2019 — **Event Volunteer - Toy Modification**
UW-Platteville Holiday Toy Hack

Oct. 2019 — **Virtual Reality Day for Kids**
Platteville Public Library

May 2018 — **Event Volunteer - Robotics Demo**
College of Engineering, Math, and Science Expo

Extracurricular Activities

Since 2020 — **FAE@UTD** - For Autistic Empowerment

Since 2021 — **Choir** - Credo Community Choir

2016 - 2020 — **FIRST Robotics** - FRC Team 171

2018 - 2020 — **Society of Physics Students**

2017 - 2020 — **Pioneer Maker Club**

2016 - 2020 — **Choir** - University Singers & Singing Pioneers