

DON WIJESINGHE

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- Extensive undergraduate research experience in robotics and programming.
- Successful teaching assistant for four years with experience in interacting, teaching and mentoring students.
- Experience in leadership roles and organizing mechanical engineering related events.

EDUCATION

Midwestern State University, Texas

Wichita Falls, TX

Bachelor of Science: Mechanical Engineering (ABET Accredited)

Minors: Math and Computer Science

GPA: 3.929/4.000

UNDERGRADUATE RESEARCH

Designing and Constructing a Humanoid Robot to Perform Gait Motions- Advisor: Dr. Yu Guo

[Awarded \$5,000 – Senior Design (ongoing Fall 2019- Spring 2020)]

- Leading a team of four senior engineering students in designing and implementing an autonomous humanoid.
- Completed structural design of a 25-DOF humanoid on SolidWorks.
- FE Analysis was performed using ANSYS for static and transient conditions. This was done to realize acceptable Factor of Safety for the system components undergoing the highest amount of stress.
- Considered the system as an inverted pendulum to determine the zero-moment point. This was done to balance the system during gait motion.

FPAA-Based Implementation of Non-Linear Oscillatory Circuits- Advisor: Dr. Yu Guo

[Awarded \$2,000 – EURECA Grant (Summer-Fall, 2019)]

- Designed the Van der Pol non-conservative non-linear damping oscillator on the Anadigm designer software by logically analyzing the second order nonlinear differential equation.
- Designed the physical circuit for the Van der Pol oscillator.
- Performed numerical analysis for the model on MATLAB using 4-ODE Runge Kutta method.

Building an Object Recognition Model Using TensorFlow- Advisor: Dr. Eduardo Colmenares

[Spring 2019]

- Tf.data API was utilized to reduce training time and improve performance by the implementation of Prefetching and Parallelized Data Transformation methods specifically for a dual core processor.
- Experimented with max pooling, custom filter sizes and dropout layers to analyze its effect on predictions.

Building a 2-DOF Non-Linear Oscillatory Circuit Model – Advisor: Dr. Yu Guo

[Awarded \$1,000 – EURECA Grant (Spring 2019)]

- Designed the Duffing oscillatory circuit on the Anadigm designer software to be analyzed using a Field programmable analog array board (FPAA).

UAV-Based Remote Terrain Search & Rescue with Payload Delivery Using Object-Based Image Analysis Advisor: Dr. Yu Guo.

[Awarded \$1,000 – EURECA Grant (Fall 2018)]

- Built and tested a quadcopter equipped with facial recognition, SLAM, and payload delivery capabilities.
- Utilized simultaneous localization and mapping (SLAM) via an onboard vision system for autonomous navigation.
- Utilized the L1 adaptive control design process as opposed to PID control for stability.

Puerto Rico Power Project – Advisor: Dr. Yu Guo

[Awarded \$2,000 – McCoy Engineering Grant (Spring 2018)]

- Built a solar-powered generator that could be deployed in power ridden disaster zones.
- Utilized 56 18650 Li-ion cells in a 4S14P configuration to store energy. (Spot welded and assembled the pack)
- With the attachment of a 136W 24V solar panel, the generator can run essential electrical devices such as a mini fridge, stove and LED bulbs continuously depending on the availability of sunlight.
- Device was shipped to a home in Puerto Rico that was in dire need of electricity with the help of a local volunteer.

Gear Transmission Consisting of Two Planetary Gear Systems Linked by Chains – Advisor: Dr. Guy Bernard

[Awarded \$2,000 – UGROW Grant (Summer 2018)]

- Utilized a mathematical approach to find gear ratio combinations in the system that was analyzed.
- Discovered a mathematical relationship between the gear ratios which resulted in obtaining simpler equations.

Search and Rescue Drone Fleet Using Neural Networks – Advisor: Dr. Yu Guo

[Awarded \$1,500 – EURECA Grant (Fall 2017)]

- Designed software capable of facial recognition for 3DR Solo drone to aid in search and rescue missions.,
- Utilized the OpenCV library to implement facial recognition capability.
- Logistic regression was performed by using missing person's image to train the neural network.
- Thermal imaging system was designed to allow drone to engage in search and rescue missions at night.

Autopiloting a Drone Using Computer Vision – Advisor: Dr. Yu Guo.

[Awarded \$1,500 – EURECA Grant (Spring 2017)]

- Built software capable of flying the 3DR Solo drone safely by avoiding obstacles to reach a target destination.
- Programmed software to use video feed from onboard GoPro to perform image analysis and object recognition and then provide feedback to drone's control system to maneuver itself.
- Utilized OpenCV to use image analysis and object recognition.
- Designed and 3D printed housing model using SolidWorks to include a Raspberry Pi onboard that would execute auto piloting software to command drone's flight pattern.

PRESENTATIONS

National Conference on Undergraduate Research

The University of Central Oklahoma, (2018)

Search and Rescue Drone Fleet Using Neural Networks.

University of Memphis in Tennessee, (2017)

Auto Piloting a Drone Using Computer Vision.

ASME E-Fest West: Pomona California, (2018)

Puerto Rico Power Restoration Using Renewable Energy.

Undergraduate Research and Creative Activity Forum (MSU Texas)

Autonomous Humanoid Robot (November 2019) | FPAA-bases implementation of nonlinear oscillatory circuits

(November 2019) | Experimental Study of a Van Der Pol Oscillatory Circuit (August 2019) | UAV-Based Remote

Terrain Search & Rescue Missions with Payload Delivery Using Object-Based Image Analysis (November 2018) | Gear

Transmission Consisting of Two Planetary Gear Systems Linked by Chains (November 2018, June 2018) | Puerto Rico

Power Restoration Using Renewable Energy (April 2018) | Search and Rescue Drone Fleet Using Neural Networks

(November 2018) | Auto Piloting a Drone Using Computer Vision (April 2017)

North Texas Area Student Conference (MSU Texas)

Design and Implementation of an Object Recognition model using TensorFlow (2019) | UAV-Based Remote Terrain

Search & Rescue Missions with Payload Delivery Using Object-Based Image Analysis (2018) | Search and Rescue Drone

Fleet Using Neural Networks (2018) | Auto Piloting a Drone Using Computer Vision (2017)

TEACHING AND WORK EXPERIENCE

The University of Texas at Dallas, Texas

Teaching Assistant

Fall 2020 – Present

- ☐ Teaching Assistant for Circuits and Applied Electronics course (Fall 2020).
- ☐ Performed in-class lab experiments and provided help and guidance for the weekly lab sessions.
- ☐ Teaching Assistant for Topics in Mechanical Engineering course (Spring 2021-Present)
- ☐ This involves providing students with help related to Machine Learning. Currently this has ranged from preprocessing data to training Shallow Machine Learning models for Deterministic Forecasting.
- ☐ The Teaching Assignments included grading coursework.

Midwestern State University, Texas

Teaching Assistant

Fall 2019 – Spring 2020

- ☐ Teaching Assistant for the Measurements and Instrumentation course.
- ☐ Perform laboratory experiments and provide help and guidance for the weekly lab sessions.
- ☐ Grading homework and laboratory reports.

Tutor & Grader

Spring 2017 – Spring 2020

- ☐ Tutored a variety of mathematics courses from basic algebra to calculus III and differential equations.
- ☐ Tutored Chemistry I, Physics I and II, and all Engineering courses.
- ☐ Tutored computer science courses: Computer Science 1, Data Structures and ADT, OOP, Discrete Structures and Analysis, and Advanced Structures and Algorithms.
- ☐ Graded homework for the Engineering department and Mathematics department faculty.

Engineering Lead Mentor

Fall 2018 – Spring 2019

- ☐ Provide guidance to the newly appointed mentors.
- ☐ Organized and coordinated mentoring related activities and events.
- ☐ Spearheaded the **Engineering Week** event.

Engineering Mentor

Fall 2017 – May 2018

- ☐ Mentored incoming freshman on how to tackle their first year in college.
- ☐ Organized activities & events to help freshman settle in such as graduate school tours, company visits, game nights and team building exercises.

Learning Community Tutor

Fall 2018

- ☐ Learning community is a pilot program designed to support and tutor engineering freshmen with Pre-Calculus.
- ☐ Took initiative in implementing this program and provided math help as the sole tutor.

SKILLS

Languages/Technologies:

- ☐ Proficient in C++, Python, MATLAB, R.
- ☐ Familiar with Java, HTML5.
- ☐ Experience with OpenCV, SFML libraries.
- ☐ Developing Neural Networks using the TensorFlow library.

Computer-Aided Design: SolidWorks.

FE Analysis: SolidWorks, ANSYS

HONORS & AWARDS

Hardin Scholarship Finalist: 2019

Introduced as one of the Four Finalists for the Hardin Scholar award during the Honor's Banquet of 2019. Hardin Scholar is Midwestern State University's most prestigious award for academic excellence.

Pi Mu Epsilon (Mathematics Honor Society): April 2019

Mathematics Honors at MSU for achieving an average of a letter grade of A or B for all mathematics courses.

Undergraduate Research:

Most creative poster UGRCA MSU Texas Poster presentation (Fall 2017) - UAV-based Remote Terrain Search & Rescue & Payload delivery via Image Analysis.

President's List: Fall 2016, Spring 2018, Fall 2018, Spring 2019, Fall 2019.

LEADERSHIP

Midwestern State University, Texas

2019-2020 Pi Mu Epsilon President: Accepted the role as President to conduct and organize events related to Texas Tau Pi Mu Epsilon mathematics honor society.

2019 Engineering week: This event was dedicated to showcase several engineering projects with the aim of attracting students to consider a future education and careers in engineering. This event also focused on celebrating and encouraging women in engineering.

- ☐ Lead planner and organizer of event.
- ☐ Provided guidance to mentor team to complete assigned tasks.
- ☐ Designed the flyer and posters for event.
- ☐ Invited graduate students to demonstrate past senior design projects.
- ☐ Planned and coordinated to secure a date, venue and time for event.
- ☐ Requested and granted permission to display unique engineering designs as well as a working 3D printer at event.
- ☐ Ensured the safety of engineering designs being transported to and from event.
- ☐ Designed an interactive mechanical crane and catapult for the event.

VOLUNTEERING

Team Lisa (2019)

Addressed Midwestern State University's Rotaract Club and members of the Wichita Falls Rotaract Club to raise contributions and support the mother of a fellow engineering student undergoing chemotherapy for breast cancer.

Midwestern State University, Texas

YES Camp (2018)

Volunteered as a chaperone for the Young Engineer Summer camp, a weeklong program for high school students with the aim of recruiting prospective students from the state of Texas and surrounding states.