ASWIN BALASUBRAMANIAM

Email: aswinbala1996@gmail.com
LinkedIn: https://www.linkedin.com/in/aswinbala/
GitHub: https://github.com/aswinbala96

EDUCATION

2018-2020 **University of Cincinnati**, Cincinnati, Ohio
M.Sc. in Electrical Engineering
Advisor: Dr. Arthur Helmicki
GPA: 3.97/4.0

2014-2019 **University of Cincinnati,** Cincinnati, Ohio
B.Sc. in Electrical Engineering Technology
Graduated Summa Cum Laude with Honors
Minor: Economics
GPA: 3.93/4.0

PROFESSIONAL EXPERIENCE

12/2017 – 05/2020 **Research Assistant**
University of Cincinnati Infrastructure Institute, Cincinnati, OH, USA

- Working on a research project that investigates the applications of small unmanned aerial systems (sUAS) to inspect structure health and construction progress.
- Assisted in the inspection of bridges, buildings, and road constructions using sUAS as a part of this project for Ohio Department of Transportation.
- Generated efficient flight plans using various research and photogrammetry tools to construct high-quality 3D models and orthomosaics to augment the inspection process for inspectors.
- Developed an Android application to generate efficient instructions to plan sUAS flight plans as per user requirements.
- Aided in designing and developing a remote one-stop system to store and stream sUAS videos and plan efficient flights for sUAS.

05/2017 - 08/2017 **Co-op Project Engineer**
Mitsubishi Electric Automotive America, Mason, OH, USA

- Worked with a team that manufactures starters for Mitsubishi and other car manufacturers.
- Assisted engineers at the manufacturing line of starter parts.
- Aided in troubleshooting machines operated using PLCs and sensors on the manufacturing line.
- Generated CAD drawings for replacement parts on the manufacturing line. Programmed and installed new PLCs and hardware during manufacturing line upgrades

01/2016 - 05/2016 & 08/2016 - 12/2016

Co-op Project Engineer
Intelligrated®, now a part of Honeywell®, Mason, OH, USA

- Assisted in designing warehouse automation electrical system schematics, layouts and power line drawings for clienteles that included -- -Walmart, Amazon, UPS, Target, and Dollar Tree.
- Hands-on experience with industry-grade hardware and software tools that monitor and assist in building electrical systems.
- Assisted in designing power systems for customers like Amazon and UPS in multiple cities.
- Installed electrical equipment and conducted on-site commissioning and troubleshooting.
- Worked with industrial software like AutoCAD electrical, WAGO checkout tool and Profitrace tool.

06/2015 - 07/2015

Summer Intern
Danway LLC, Dubai, U.A.E.

- Compiled sales and purchase orders in Excel.
- Read and studied electrical layouts and power distribution drawings of electrical devices.
- Assembled electrical devices on panel rails based on electrical schematics.
- Learned the assembly of LV and MV panels and function of devices in them.

05/2015 - 05/2015

Summer Intern
Al Ghail Power Plant, Ras Al Khaimah, U.A.E.

- Learned the functionality and working of a power plant.
- Assisted in the daily inspection of the plant.
- Documented and tracked power supply and consumption to and by customers. Interacted with and monitored the plant's systems using HMI and ladder logic programming

08/2015 - 12/2015 & 08/2017 - 12/2017

Peer Tutor
Learning Assistance Center University of Cincinnati, Cincinnati, OH, USA

- Facilitated a learning environment for one-on-one tutoring in 1000+ level STEM courses.
- Assisted students with study techniques that would result in improved academic performances.
- Participated in seminars to increase skills related to communication, teamwork, professional profile building, and leadership.
- Completed Level 1 College Reading & learning Association's (CRLA)'s international tutor training program certification.

DESIGN PROJECTS

Independent Study

Automatic Detection and Classification of Concrete Cracking

- Developed an algorithm that detects and classifies concrete cracks.
- The algorithm was implemented using the MATLAB environment and utilizes OTSU thresholding and morphological operations to detect cracks that cover more than 5 pixels in an image.
- The code classifies cracks as transversal, longitudinal or diagonal and estimates their length and thickness.

Intelligent Systems (EECE 6036)	**Supervised Classification of Handwritten Digits using the MNIST dataset** - Implemented and trained a multi-layer feed forward network to detect various handwritten digits using the MNIST dataset. - The network was trained using back-propagation with momentum and achieved a 95% hit rate.
Senior Design Project (ELTN 40112)	**Mission Box** - Designed and built a portable hardware console that would aid the Ohio Department of Transportation's UAS center to monitor and record sUAS video feed for surveillance and inspection missions. - The system will aid users to record, stream and store sUAS videos locally and online.
Senior Design Project (ELTN 4012)	**Mission Planner Android Application** - Android application built to complement the mission box project, that allows users to create plans for the sUAS that automates flights to capture images as per their requirements. - Application was designed to improve the functionality of DJI GS Pro flight planning application by allowing users to specify mission requirements (e.g. mapping a building, bridge, or construction site). It also generates a step-by-step instruction manual that would allow users to program plans on the DJI GS Pro application efficiently. - The application allows users to plan missions that would aid in bridge, facility and construction site inspection, displays detailed information about popular sUAS camera systems and access to multiple calculators pertaining to photogrammetry mission planning.
UAVs for Urban Development (AEEM 3077)	**Aether: Swarm Drones for Search & Rescue (Business Model)** - Designed a business model that used UAVs to aid in search and rescue missions. - Generated a business model, conducted customer surveys, generated an economic model, developed concepts for air operations and presented a detailed operational concept.
Advanced Microsystem Design (EECE 6038C)	**Mini 2D CNC Plotter** - Designed and built a prototype mini CNC plotter using Mikromeida PIC24 Development Board, stepper motors and servo. - The final device automated neat hand-written notes/drawings.
Embedded Systems (ELTN 3042C)	**T-Rex Jump Survival of the Fittest** - Replicated the TRex jump game available on Chrome using the 8051 microcontroller, LCD, piezo buzzer and pushbuttons. - The code for the game was written in Embedded C. - The pushbuttons allowed the users to interact with the game while the piezo buzzer created sound effects to augment the users gaming experience.

Engineering Models 2 (ENED 1091)

MATLAB Graphing Calculator

- Developed a graphing calculator using the MATLAB environment.
- Utilized the GUI functionalities available on MATLAB to design and program the calculator.

CONFERENCE PROCEEDINGS & PRESENTATIONS

27th ASNT Conference 2018

Venkatesh, C., **Balasubramaniam, A**., Kumar, R., Brown, B., Norouzi, M., & Helmicki, A., (2018) "Construction Site Evaluation Employing 3D Models using UAV imagery". Paper presented at the 27th ASNT Research Symposium

IEEE STRATUS Conference 2019

Balasubramaniam, A., Identifying and Quantifying UAV Camera Limitation: Case Study using DJI XTR Camera. Case study presented at 2019 IEEE STRATUS Conference

PUBLICATIONS

MS Thesis 2020

Balasubramaniam, A., Applications of Small Unmanned Aerial Systems (sUAS) and Photogrammetry to Monitor and Inspect Structural Health and Construction Sites

ODOT Manual 2020

Balasubramaniam, A., Helmicki, A., Hunt, V., & Brown, B. (2020) Standard Operating Procedure (SOP) for Construction Site Mapping and Producing their accurate 3D Model Representation

ODOT Manual 2020

Balasubramaniam, A. Helmicki, A., Hunt, V., & Brown, B. (2020) Standard Operating Procedure (SOP) for Mapping Structures (Bridges and Buildings) and Producing their accurate 3D Model Representation

EXTRACURRICULAR ACTIVITIES

2015-2017

Hyperloop UC

Graphics Designer (2015), Transponics Engineer (2015-16), and Electronics Lead (2017)

- Assisted in designing the electrical system of the team's vehicle.
- Tested LiPo batteries and industrial grade sensors under vacuum conditions.
- Designed PCB shields for Arduino and those necessary for sensor and device integration. Assisted in assembling the electronics by soldering and crimping various battery and sensor cables.
- Researched and implemented circuit protection methods to prevent circuit failure and suppress fire hazards.
- Assisted and oversaw installation of the electrical system on the vehicle to ensure conformance to design and equipment specifications.
- Delegated testing and manufacturing responsibilities to members in the electronics sub system.

2014-2018

University of Cincinnati Quiz Club

Treasurer/Co-Founder (2014-16), President (2017-18)

- Organized themed based trivia events across the university and collaborated with various groups on campus to host events.
- Managed finances for the club, and organized weekly trivia events for members of the club

2017-2018 **University of Cincinnati IEEE Chapter**
Secretary
- Recorded meeting minutes and sent meeting notices to members
- Organized and conducted a workshop on the basics of PCB designing and manufacturing

2017-2018 **University of Cincinnati Engineering Diplomat**
- Aided in mentoring exchange students from UC's sister university Chongquing University helping them adapt to the university and college life in general.

2014-2015 **University of Cincinnati Racial Awareness Pilot Program (R.A.P.P.)**
- R.A.P.P. is a nine-month intensive program conducted at the University of Cincinnati that discusses various social factors like race, gender, sexuality, religion, socioeconomic status and other factors that influence a person's identity.
- Our activities involved discussing various social factors as a whole group, while discussing case studies as a small group to emphasize on points that resonate with others.

AWARDS & RECOGNITION

2014-2019 **University of Cincinnati International Outreach Scholarship**

2014-2019 **University of Cincinnati Global Scholarship**

2014-2019 **Alpha Lambda Delta National Honors Society**

2014-2019 **Dean's List College of Engineering and Applied Sciences**

2015-2019 **University of Honors Program**

2019 **Senior Design Project Honorable Mention**

2019 **Graduated Summa Cum Laude with Honors and top of the 2019 technology major class**

SOFTWARE SKILLS

- MS Office 365
- C++
- Matlab & Simulink
- Adobe Illustrator
- Adobe Photoshop
- Adobe After Effects
- Lego NXT-G
- AutoCAD
- Visual Basic Application
- Python
- CADSoft Eagle
- NI Multisim
- Verilog
- ArcGIS
- Mitsubishi PLC Tools
- Pix4D Mapper
- Android Studio
- RS Logix
- LaTEX
- QGIS
- Microstation
- LabView
- Context Capture
- R
- SQL

Reference List

Dr. Arthur Helmicki **Email:** helmicaj@ucmail.uc.edu

Work Phone: +1513-556-6069

Dr. Victor Hunt **Email:** huntvj@ucmail.uc.edu

Work Phone: +1 513 556 3687