Surafel Anshebo

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EDUCATION

VIRGINIA TECH **May 2023 – Present**

Master of Science, Mechanical Engineering

ABABA SCIENCE AND TECHNOLOGY UNIVERSITY **2013 - 2018**

Bachelor of Science, Mechanical Engineering

PROFESSIONAL EXPERIENCE

VIRGINIA TECH

Graduate research assistant **May 2023 – Present**

- Developed a BVLOS (Beyond visual line of sight) flight simulator using Python, Docker, Leaflet, and Dronekit-Python, enabling mission planning and flight risk assessment.
- Provided guidance to up to 50 students for drone technology and flight operations classes through office hours. Assisted with coursework, assignments and projects.

COCA COLA BEVERAGES

Line process engineer **Dec 2018 - Dec 2023**

- Maintained compliance with Safety, Health, Environment, and Quality (SHEQ) standards.
- Optimized overall Equipment Efficiency (OEE) by understanding the structure of all machines to detect abnormalities and conduct Root Cause Analysis (RCA) on different breakdowns using SAP.
- Maintained 90% Machine efficiency (ME) and 85% Unconstrained system line efficiency (USLE) ensuring operational reliability.

SKILLS

- **Software:** Python, C++, MATLAB, ROS, Flask, Docker, OpenCV, Dronekit-Python, SolidWorks, QGIS, SAP
- **Hardware:** Raspberry Pi, STM32, Arduino, Vicon motion capture, 3D Printing
- **Certifications:** Part 107, SolidWorks Associate (CSWA)
- **Selected coursework:** Applied Linear Control, Computer vision, Advanced Mechatronics, Computation for Data Science

PROJECTS

Vicon motion capture for an indoor flight **Nov 2024**

- Conducted system calibration to minimize tracking errors, ensuring millimeter accuracy in position estimate.
- Implemented an extended Kalman filter (EKF) for sensor fusion enabling precise position and altitude estimate.
- Deployed ROS nodes on a Raspberry Pi companion computer to handle communication between the motion capture system and Pixhawk flight controller.

Full state feedback control using pole placement **Dec 2023**

- Optimized system dynamics using pole placement techniques, ensuring stable descent.
- Developed closed loop control using linear-quadratic regulator (LQR) and Luenberger observer for accurate trajectory tracking with 5% settling time in 3 seconds.

Flood Hazard Mapping and Drone-Based Life-Saving Vest Delivery System **Nov 2022**

- Mapped areas that are prone to flood hazard using aerial image using QGIS and designed a gripper in SolidWorks to be mounted on S500 drones used for delivering lifesaving vests.

PUBLICATION

- D. Aggarwal**, S.T. Anshebo,** K. Kochersberger, A.L. Abbott. "Comparative Study of Vision-Based Methods for Real-Time Traffic Monitoring," *XPONENTIAL 2024 Conference*, pp. 68–79. DOI: 10.52202/075106-0004**.**

LEADERSHIP

AMERICAN SOCIETY OF MECHANICAL ENGINEERS

TREASURER **May 2024 - Present**

- Maintain financial records and ensure that all accounts and records are maintained in accordance with the school and ASME policies.