

Surafel Anshebo

Blacksburg, VA • Surafela@vt.edu • +1 (540) 558-3768 • Surafeltesfaye.github.io

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

- Implemented a Dockerized simulation environment for ArduPilot SITL, integrated with Flask.
- Built ground and air risk map using Leaflet.js and QGIS for Beyond Visual Line of Sight (BVLOS) simulations.
- Developed and deployed flight management software adhering to Association for Uncrewed Vehicle Systems International (AUVSI) standards, incorporating flight requests, pre/post-flight procedures, and safety reporting system.

COCA COLA BEVERAGES

Line process engineer

Dec 2018 - Dec 2023

- Maintained compliance with Safety, Health, Environment, and Quality (SHEQ) standards.
- Developed an optimized level control system for the fuel and condensed water return tanks of 8-ton boiler, enhancing operational efficiency, improving safety, and achieving annual cost saving by \$12,000.
- 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, 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 in MATLAB.

Flood mapping, search and rescue operation using S50 drone

Nov 2022

- Mapped areas that are prone to flood hazard using aerial image using QGIS
- 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](https://doi.org/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.