Ahmed Yesuf **Nurye**

System Engineer @ Northvolt · Robotics Enthusiast

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Summary

I'm currently pursuing my M.Sc. in Robotics and Automatic Control at Warsaw University of Technology. I'm a fast learner, possessing self-taught skills in Python, C++, MATLAB/Simulink, ROS2, software design and testing, along with proficiency in Git and Linux OS. I'm deeply passionate about the development of intelligent systems, particularly in the fields of deep reinforcement learning, computer vision, human-robot interaction, perception, localization, mapping, and planning.

Education

Warsaw University of Technology — *Warsaw, Poland*

M.Sc. in Robotics and Automatic Control | CGPA: 4.68/5.0 — *Oct. 2022 - Oct. 2024*

- Advisor: prof. dr hab.inż. Elżbieta Jarzębowska.
- Thesis: Mobile Robot Navigation in a Dynamic Environment.

Addis Ababa Science and Technology University — *Addis Ababa, Ethiopia*

B.Sc. in Electrical Engineering | CGPA: 3.96/4.0 — *Oct. 2016 - Sep. 2021*

- B.Sc. Project: Smart Irrigation System Powered by Dual Axis Solar Tracker.

Industry

Northvolt — *Gdańsk, Poland*

System Engineer | Model-based Design Verification and Validation Engineer — *Apr. 2024 - Present*

- Maintenance of model, software and hardware in the loop software.
- Develop test cases & perform unit testing for battery management system functions.
- Perform model-based verification and validation for battery management system functions.

New Era Research and Development Center — *Addis Ababa, Ethiopia*

Robotics Engineer Intern — *Apr. 2021 - Jun. 2021*

- Implemented various algorithms for mobile robot path planning (e.g., Bug1&2, Wavefront).

Projects

Deep Reinforcement Learning-Based Mobile Robot Navigation in a Dynamic Environment Using *ROS2* — *Warsaw, Poland*

Warsaw University of Technology | M.Sc. Thesis | Advisor: Prof. Elżbieta Jarzębowska — *Mar. 2024 - Oct. 2024 (expected)*

- Developing a deep reinforcement learning-based framework for mobile robot navigation in a dynamic environment using *ROS2* and Gazebo
- Main tools used: Python, PyTorch, ROS2 and Gazebo

Development of Kinematic Analysis Tool Using Absolute Coordinates — *Warsaw, Poland*

Warsaw University of Technology | Co-Advisors: Prof. Janusz Frączek & D.Sc. Marek Wojtyra — *Oct. 2024 - Jan. 2024*

- Developed a kinematic analysis tool using absolute coordinates for a general case planar multi-body system in MATLAB environment.
- Tested the implementation against results obtained from *MSC Adams* simulation software.

Six Degree of Freedom Serial Manipulator — *Warsaw, Poland*

Warsaw University of Technology | Advisor: Dr inż. Paweł Maciąg — *Feb. 2022 - Jun. 2022*

- Derived the analytical solution of the inverse kinematics of the robot arm.
- Performed both task space (using interpolation) and joint space (using *LSPB* and quintic polynomial) trajectory planning.
- Tested implementation on the actual hardware for a pick and place task.

Mobile Robot Navigation Using Wavefront Algorithm — *Warsaw, Poland*

Warsaw University of Technology | Advisor: Dr. Dawid Seredyński. — *May. 2022 - Jun. 2022*

- Implemented the wavefront algorithm using MATLAB
- Demonstrated the simulation for a youBot using CoppeliaSim

Controller Design Specification for a 6-DOF Serial Manipulator with a Two-State Gripper Endowed with Visual Perception — *Warsaw, Poland*

Warsaw University of Technology | Advisor: prof. dr hab. inż. Cezary Zieliński — *Feb. 2022 - Jun. 2022*

- Determined the internal structure of the agent and appropriate sampling rates of the agents' subsystems.
- Specified the general behavior of the virtual effectors and receptors.
- Defined the agents transition and terminal conditions governing its behaviour.
- Determined the structure of the *FSM* of the control subsystem invoking the defined behaviours.

Skills

Programming and Simulation Python, C++, MATLAB, Simulink, ROS, Gazebo, CoppeliaSim

Robotics & Learning Motion Planning, SLAM, Kinematic & Dynamic analysis, Multi-body systems, Control Theory, Machine Learning

Other Tools Linux, Shell (Bash/sh), Git, LaTeX, Microsoft Office

Soft Skills Excellent Communication, Time Management, Teamwork, Problem-solving, Presentation

Languages English (CEFR - Level C1), Amharic (Native)

Teaching

Addis Ababa Science and Technology University

2021 **Electrical Measurement & Instrumentation (*EEEg3153*)**, Teaching assistant

2022 **Introduction to Control System (*EEEg4155*)**, Teaching and lab assistant

Achievements & Volunteer Work

2024 **Mr Tomaka's Scholarship**, Warsaw University of Technology — *Warsaw, Poland*

2022 **Banach Scholarship**, NAWA - Polish National Agency for Academic Exchange — *Warsaw, Poland*

2021 **Gold medal**, Graduated with the highest honer (rank: 1/ 450) — *Addis Ababa, Ethiopia*

2019 **Charity Affairs Committee**, Served as core member of *AASTU* students union charity affairs committee — *Addis Ababa, Ethiopia*