Andnet DeBoer

M.S. in Robotics, Northwestern University

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EDUCATION

Northwestern University *Evanston, IL*
Master of Science in Robotics (MSR) – *Courses: Robotic Manipulation, ML & Sensing, ROS2, Dynamics* *Expected Dec 2026*

Hope College *Holland, MI*
B.S. in Electrical Engineering & Computer Science *Graduated May 2025*

Study Abroad: Singapore Management University [AI, Spring 2023]; Technische Universität Berlin [Eng., Summer 2022]

PROFESSIONAL EXPERIENCE

Robotics Controls Engineer (Co-op & Intern) — Gentex Corporation *Zeeland, MI — Jun 2024 - May 2025*

- Reduced 6-DOF **ABB** robot cycle time by over 40% by optimizing paths utilizing simulation and **RAPID** code.
- Developed agile software with **C#** and **.NET Framework** focusing on continuous improvement for robot work cells
- Built a code converter in **Python** to transform ABB RAPID code to FANUC Karel code, accelerating robot integration

RD Electrical Engineering Intern — Stryker *Flower Mound, TX — May 2023 - Aug 2023*

- Designed an automated robotic system for V&V testing to meet stringent class II **FDA** medical device regulations.
- Automated 800+ hours of high-cycle testing using **Python & OpenCV**, saving over $40,000 in direct labor costs.
- Tuned **PID controllers**, performed tolerance analysis, and integrated linear actuators via serial communications.

Multi-Unit Robotics Researcher — Hope College *Holland, MI — May 2022 - July 2022*

- Developed algorithms with **ROS** for a multi-robot Turtlebot system to validate general purpose research platform.
- Integrated **Raspberry Pi**s into a distributed network, utilizing **xUbuntu** , **Python**, and high frequency ultrasonic sensors

Automation Engineering Co-Op — Peloton, Inc. *Otsego, MI — Aug 2020 – Aug 2021*

- Programmed **FANUC** 6-DOF and MiR autonomous mobile robots for research on coordinated material handling tasks.
- Designed assemblies in **SolidWorks**; field-wired panels and programmed **PLCs/HMIs** for assembly machines.

PROJECTS

Robotic Manipulation with ROS2 *Fall 2025*

- Built a perception-to-action pipeline (**Python**, **OpenCV**, **ROS2)** for a PincherX 100 arm to identify and grasp targets.
- Developed a custom camera-to-robot calibration procedure to achieve high-accuracy 3D pose estimation.

Self-Playing Electric Bass Guitar (Capstone) *Jan - May 2025*

- Designed a self-playing bass with 12 actuators for automated picking and fretting, integrating a **Raspberry Pi** with custom mechatronics (**3D printed parts**, servos, solenoids) utilizing **I2C**, **PWM**, and **DIO** signals for control.
- Developed **Python** software to parse **MusicXML** into a timing matrix and built a **Flask** web app for user interaction.

Roadside Assistance Mobile App *Jan - Aug 2025*
Deployed a full stack roadside assistance app on **AWS**, leading an Agile team using **Flutter**, **SpringBoot**, and custom **APIs**.

TECHNICAL SKILLS

Languages	Python, C++, Java, MATLAB, RAPID, Karel
Robotics	ROS/ROS 2, PyTorch, SLAM, OpenCV, Control Systems, Motion Planning, Sensor Fusion
Software & Tools	Git, Docker, Linux, AWS, SolidWorks, ABB RobotStudio, Gazebo
Hardware	Intel RealSense, Raspberry Pi, Arduino, 3D Printing, DMM, ABB/FANUC/Franka Robots

PUBLICATIONS & AWARDS

- **GP-MARS (Multi-agent Robotic Systems):** Validated a general-purpose multi-agent research platform. *IEEE, 2025.*
- **VanPutten Engineering Design Award**, Hope College: Elected by faculty for exceptional skill in engineering design.

LEADERSHIP & VOLUNTEERING

International Project Chair — Engineers Without Borders (4 years) *Teodomiro, Ecuador — Kagarama, Rwanda*

- Led student teams in the technical design of water supply projects in Ecuador & Rwanda with a combined 1,800 beneficiaries