Anna Novak

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Education

University of Michigan — Ann Arbor, MI
Bachelor of Robotics, — *May 2026*
Bachelor of Computer Science — 4.0 GPA

Experience

Instructional Aide — January 2023 – Present
ROB 101: Computational Linear Algebra — *Ann Arbor, MI*

- Assist students struggling with linear algebra and programming in Julia by asking leading questions and clarifying lecture explanations to help them fully learn the material.
- Chosen to help train new Instructional Aides for the course offering at other colleges and universities due to my ability to explain topics in depth, provide useful feedback, and stay organized.

FIRST Robotics Programming Mentor — September 2022 – Present
FRC Team 6861 — *Livonia, MI*

- Guide freshmen through the process of programming, testing, and debugging a robot to successfully play the season's game and be a strategic alliance member.
- Created a self-paced Java curriculum introducing new team members to fundamental programming concepts to ensure students of many backgrounds share a common base knowledge.
- Developed curriculum for a workshop teaching elementary school students programming through Python Turtle in an interesting way that inspired students to pursue programming.

Projects

Robot Motion Control | *C, Jetson, Pico*

- Implemented odometry and kinematics on MBot using Pico board to control motors and Jetson to control overall movement.
- Tuned PID controller for smoother driving and adjusted robot's characteristic values for accurate driving.

Content-Aware Image Resizing | *C++*

- Developed program to shrink images in PPM format to any desired size without cropping.
- Implemented seam-carving algorithm to analyze the image's matrix representation to find and remove the least important pixels based on the differences between neighboring pixels.

Robotic Fish | *C++, Java, Arduino*

- Built robotic fish with 3D-printed body, Arduino, and servo-controlled tail that successfully swam in a water tank.
- Collaborated with 4 other group members and coordinated helpful organization and communication.
- Programmed the swimming methods on the Arduino and simulated testing ocean chemical levels using Java.

Zoo Logistics Optimization | *C++*

- Optimized zookeeper's path by finding a minimum spanning tree between habitats using Prim's algorithm.
- Solved the Travelling Salesman Problem using the branch and bound solution to find optimal canal path to provide water to all habitats.
- Determined efficient heuristic to find nearly-optimal canal paths to scale up for use on larger zoos.

Bible Verse Linker | *Javascript*

- Created Google Apps script to find Bible verse references in a Google Doc and insert hyperlinks leading to the verse in an online Bible.
- Utilized RegEx and string manipulation to search the document for references.

Relevant Coursework

Computer Science: Data Structures and Algorithms, Intro to Computer Organization, Discrete Math
Robotics: SLAM & Navigation, Robotics Mechanisms, Human-Robot Systems, Logic Design

Technical Skills

Languages: C++, C, Python, Java, Julia, Javascript
Tools: Git, Arduino, Command Line