

# Warren Kozak

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## EDUCATION

### Carleton College

September 2023 – June 2027

*Bachelor of Arts in Computer Science, Mathematics; Cumulative GPA: 3.9/4.0*

*Northfield, MN*

- Relevant Coursework: Discrete Math, Advanced Software Design, Programming Languages, Introduction to Computer Systems, Robotics, Parallel and Distributed Systems, Multivariable Calculus, Linear Algebra, Ordinary Differential Equations, Computational Linear Algebra

## RESEARCH EXPERIENCE

### Northwestern University (THILT Lab)

July 2025 – August 2025

*NSF REU Undergraduate Researcher*

*Evanston, IL*

- Prototyped wearable devices for use in swimming using a Seeed Studio nRF52840 Sense
- Optimized data logging with FreeRTOS, increasing IMU sample rate from 25 to 50 Hz for more reliable data
- Utilized a Mahony filter algorithm to generate quaternions from 6-axis IMU data to detect device orientation
- Developed an LSTM model to classify IMU data into stroke categories, achieving an accuracy of 95%
- Presented data logging and LSTM classification findings at the 2025 Carleton College Undergraduate Research Symposium

## INDUSTRY EXPERIENCE

### Garmin

June 2026 – August 2026

*Embedded Software Engineering Intern*

*Olathe, KS*

- Incoming Embedded Software Engineering Intern for Summer 2026 on GNSS Platforms Team

### Hildebrand Technology

June 2024 – August 2024

*Summer Intern*

*London, UK*

- Developed a Python-based Home Assistant integration utilizing MQTT and REST APIs to process real-time IoT energy data for Hildebrand Glow devices

## SELECTED PROJECTS

### Multi-Agent Robotic Pursuit & Evasion | ROS2, Gazebo, Python

April 2026 – Present

- Simulating multi-agent robotic pursuit and evasion with ROS2 and Gazebo with artificial potential fields
- Writing a short technical report highlighting our approach and findings

### N-Body Physics Sim | C++, Raylib, AGAMA

March 2026 – Present

- Implementing an n-body physics simulator with raylib graphics
- Utilizing Barnes-Hut algorithm to increase simulation efficiency together with Verlet integration

### T5-Harmony Music Generation | Python, T5-Base, PyTorch

September – November 2025

- Fine-tuned a seq2seq T5-Base LLM on 30,000+ songs to understand and generate symbolic music
- Evaluated model output using quantitative metrics and human evaluation
- Authored a formal technical report detailing training approach and results

## TECHNICAL SKILLS

**Languages:** C++, C, Python, Lisp/Scheme,  $\LaTeX$

**Robotics & Embedded:** ROS2, FreeRTOS, Arduino, PlatformIO, MQTT

**Simulation & ML Libraries:** Gazebo, TensorFlow/Keras, AGAMA, NumPy, pandas

**Developer Tools:** UNIX/Linux, Git/GitHub, Docker, Neovim

## LEADERSHIP & ACTIVITIES

### CS Course Staff | Carleton College

September 2025 – Present

- Evaluating and providing technical feedback for student submitted work in Discrete Math and Algorithms

### Team Captain & Academic All-District | Men's Varsity Swim & Dive

September 2023 – Present

- Leading daily captain's practices during the off-season, helping coaches coordinate and lead team
- Swam at 2025 MIAC Championships, achieving all-MIAC in the 200 medley and freestyle relays