Lucas Swierad

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EDUCATION

University of Michigan | Ann Arbor, MI **Dec 2026**

Bachelor of Science in Engineering (B.S.E), Computer Science and Robotics — GPA: 3.3/4.0

Relevant Courses: Intro to Machine Learning, Web Systems, Intro to Robot OS, Data Structures and Algorithms, Intro to Logic and Design

TECHNICAL SKILLS

Programming Languages: C+, Python, JavaScript, SQL, HTML/CSS, Verilog

Frameworks & Libraries: PyTorch, ROS, Flask, Jinja2, React.js, Node.js, Express.js, LangChain, scikit-learn, Pandas, Matplotlib

Tools & Platforms: Git, JWT, Gradio, SolidWorks, Figma, Streamlit

PROFESSIONAL EXPERIENCE

Instructional Aide (IA), ROB 204 – Introduction to Human-Robot Systems (Incoming January 2026)

- Assist with course instruction, including preparation of instructional materials and leading laboratory sections
- Support lectures, recitation sections, and assessment through grading and exam administration

PROJECTS

Semantic Book Recommender using LLMs | Personal **June 2025**

Technologies: Python, OpenAI, LangChain, Gradio, ML

- Created a semantic book recommendation engine using OpenAI embeddings to transform book descriptions into vector representations and retrieve similar titles via cosine similarity.
- Leveraged LangChain for LLM workflow orchestration and Gradio to deploy an interactive UI.

Replicating ChatGPT 2 | MDST **June 2025**

Technologies: Pytorch, Numpy, Pandas, LLMS, ChatGPT,

- Recreated a scaled-down version of OpenAI's GPT-2 architecture from scratch in Python, implementing key transformer components including multi-head attention, positional encoding, and layer normalization.
- Applied linear algebra and deep learning fundamentals to train and fine-tune the model on text datasets, gaining hands-on experience with tokenization, embeddings, and language modeling objectives.

Teleoperation Keyboard & MBot Driver | ROB320 **September 2025**

Technologies: C++, POSIX, Robotic Control, Signal Handling, Serialization, Networking (TCP sockets, client/server pub/sub)

- Implemented a command-line teleoperation system to drive the MBot Omni robot using keyboard input
- Implemented TCP socket-based communication drivers to interface a GUI with the MBot and RPLidar over a wireless network.

Web Systems Project | EECS485 **September 2025**

Technologies: Python, Javascript, HTML, CSS, Jinja2, Flask, React, AWS

- Built a dynamic full-stack Instagram-like web application with Flask, SQL, and Jinja2, implementing user authentication, post feeds, and database-backed interactions.
- Engineered a single-page React frontend that consumed a RESTful Flask API, enabling asynchronous data fetching, state management, and dynamic client-side rendering.

Dog Breed Classification | EECS445 **October 2025**

Technologies: Python, Javascript, HTML, CSS, Jinja2, Flask, React

- Implemented and trained convolutional neural networks (CNNs) in PyTorch to classify images from the Dogs dataset.
- Applied transfer learning using pre-trained models (e.g., ResNet) to improve accuracy and training efficiency.
- Analyzed model performance through metrics, visualization, and hyperparameter tuning to optimize generalization.

EXTRACURRICULAR EXPERIENCE

Michigan Data Science Team (MDST) **January 2025 - Current**

- Developed a machine learning model to predict flight prices using historical data using ML (Tabular) and Streamlit
- Replicated the LLM ChatGPT 2 from scratch in python using transformers and tokens.

Autonomous Robotic Vehicle **September 2025 - Current**

- Computer Vision and Machine Learning Team: implemented obstacle and lane detection algorithms and merged multi-camera views to support autonomous robot navigation through complex courses.