KARISSA BARBU

PROFESSIONAL SUMMARY

- Hands-on experience in both software and hardware aspects of **Robotics**, **Computer Vision**, and **Human-Robot Interaction** primarily at Carnegie Mellon University.
- Passionate about applying AI and robotics to solve real-world challenges to drive impactful, **human-centered solutions**.

SOFTWARE & HARDWARE

- Python; C; C++; Java; JavaScript; R Studio
- SQL; PowerBI
- nCino banking operating system on Salesforce
- ROS; Arduino; MATLAB; CAD; Modeling with SolidWorks & Autodesk Fusion360
- NeRF, MuJoCo, NeuralHaircut, COLMAP, TensorFlow, PyCubed, SmartPong, Kalibr, NVIDIA Jetson Nano AI Computer, Augmented Reality Mapping
- PocketQube Satellite; Yasakawa GP12 Robot; Fetch Mobile Manipulator Robot
- Data Governance; Web design; Agile Software Development

RESEARCH EXPERIENCE

Carnegie Mellon University **May 2023 – May 2025**

Research Assistant, *Professor Jeffrey Ichnowski's Momentum Lab*

- Research Lead on the Robot Remote project, examining the impact of different teleoperation features on the performance of robot operation. Used a custom iPhone application and AR mapping to manipulate an Xarm – 7 robot. Created simulations of different robots in MuJoCo and used the custom application to teleoperate the simulation.
- Explored robots manipulating deformable objects - studied the behavior of these objects while they are being manipulated at high-speed using computer vision & NeRFs, to better perceive and predict interactions to inform and create manipulation policies.
- Worked on Hair Simulations using NeuralHaircut from Samsung Labs, to create accurate reconstructions of an individual's unique hair anatomy, scalp, and head shape. Built upon MOE-Hair, this integration enhanced the robot's capabilities to foster safer and more personalized hairstyling experiences for individuals with limited mobility. Utilized COLMAP for accurate camera pose estimation to enhance the precision of hair strand extraction and explored the integration of dynamic manipulation techniques to enable the robot to interact effectively with its environment. Presented a Poster at the 2024 Meeting of the Minds titled *Dynamic Manipulation: Leveraging NeuralHaircut to Advance Robotic Hairstyling.*
- Set up Yaskawa's GP12 robot with ROS compatibility at the National Robotics Engineering Center (NREC) and used Kalibr to calibrate cameras in a panoptic studio.

Carnegie Mellon University **January 2022 – May 2022**

Research Assistant - Professor Zachary Manchester's team

- Worked on PocketQube, a 5 cm cube satellite.
- Modified structural pieces in the preexisting PyCubed hardware library to accommodate the new PocketQube printed circuit boards
- Created working models and assemblies for all components.

Discovery Lab Global (DLG) **May 2019 – August 2020**

Research Intern

Discovery Lab Global is a non-profit educational and scientific organization designed to become a student-powered entrepreneurial research center with global reach. It was founded by Dr. Rob Williams, a seasoned aerospace professional, retired from the Air Force.

- Led a team focused on modifying an RC car as an AI testbed using the NVIDIA Jetson Nano AI computer and involving AI technologies for autonomous vehicles.
- Authored a Technical Document on the SmartPong program describing the functionality of the Python code. Worked on improving the functionality of the SmartPong using Tensorflow.
- Special Project: Worked with Airforce representative to prepare recommendations about how to organize a Virtual Reality environment with publicly available information.
- Presented at the National Aerospace and Electronics Conference, "*Intro to AI Deep Learning Fundamentals using the SmartPong Program*", part of Discovery Lab Global session.

WORK EXPERIENCE

Carnegie Mellon University, Pittsburgh, PA **August 2022 – December 2023**

AI Maker Space Assistant

- As subject matter expert for the Fetch Mobile Manipulator robot, I created documentation and provided technical assistance to students in how to use Fetch

Key Bank, Cleveland, OH **May 2022 – August 2022**

Summer Intern, Technology Operations and Services Division

- Created a data dictionary of nCino objects in Salesforce during this 10-week internship

Center Of Science and Industry (COSI), Columbus, OH **June 2019 – August 2020**

Apprentice

- 1000+ volunteer hours; Trained, evaluated, selected and mentored volunteers.
- Performed science experiments, provided science experiences & customer service.

EDUCATION

Carnegie Mellon University, School of Computer Science, Pittsburgh, PA

Bachelor of Science, Artificial Intelligence with Minor in Entrepreneurship **May 2025**

Selected Coursework:

- Machine Learning with Graphs; Introduction to Machine Learning; Computer Vision
- Human Robot Interaction; AI: Representation & Problem Solving; AI, Society, & Humanity
- Principles of Imperative Computation; Computational Perception; Probability Theory for Computer Scientists
- Concepts in Artificial Intelligence; Great Ideas in Theoretical Computer Science
- Global Business; Funding Entrepreneurial Ventures; New Venture Creation; Intro to Product Management.

CERTIFICATIONS

- **Davidson College**, *From Database to Dashboard using SQL and Power BI* **August 25**

AWARDS

- Fall 2024 & Spring 2025 – Carnegie Mellon Dean's List High Honors
- 2019 - 2021 – Aspirations in Computing, National Center for Women and Information Technology, National Honorable Mention, Ohio affiliate winner, three consecutive years.