





HARRISON BOUNDS

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 **PORTFOLIO:** harrisonbounds.github.io

Education

Northwestern University

M.S. in Robotics (Expected Dec. 2025)

Sep. 2024-Present

Chicago, IL

University of Central Arkansas

Bachelor of Science in Computer Science

Aug. 2020-Dec 2023

Conway, AR

Skills

Programming Languages: C++, Python, C, Java, SQL, LaTeX, Node.js

Software: ROS/ROS2, Linux, PyTorch, OpenCV, Git, Bash, Coppelia Sim, Gazebo, MuJoCo, Isaac Sim, Isaac Lab

Hardware: Raspberry Pi, Arduino, NVIDIA Jetson, Soldering, 3D printing

Robotics: SLAM, Reinforcement Learning, Legged Locomotion, LLM, VLM, VLA

Experience

Autonomous Robotics Engineer Intern | JLG

May 2025-Aug 2025

- Integrated visual slam into proprietary hardware for successful autonomous navigation
- Compared ouster lidar to realsense camera for SLAM applications leading to reduced cost without sacrificing efficiency
- Performed dynamic object filtering using object recognition and segmentation for increase localization accuracy

Machine Learning Research | University of Central Arkansas

Sep 2023-May 2024

- Classified malware anomalies using random forest models
- Produced a synthetic dataset with text-based Generative Adversarial Networks

Clustering Algorithm Research | University of Central Arkansas

Jun 2023-May 2024

- Collaborated with a research team to publish a comparative study on the Jancey K-Means algorithm in C++
- Built an Online K-Means algorithm from scratch using C

Publications

- **Harrison Bounds**, M. Emre Celebi, Jordan Maxwell, Color quantization using an accelerated Jancey k-means clustering algorithm, J. Electron. Imaging 33(5), 053052 (2024)

Projects

VLA for Manipulation | VLM, Reinforcement Learning, VeRL, Isaac Sim, Isaac Lab, Sim-to-Real, ROS 2

Feb 2025

- Creating a simulation pipeline with Isaac Sim and Isaac Lab to interface with VLA model
- Training an VLA model with RL to deploy into the real world using ROS 2

Hexapod Learning to Walk | C++, Reinforcement Learning, Inverse Kinematics, Python

Jan 2025

- Designed and built a six-legged robot that uses inverse kinematics to move with a tripod gait
- Trained a locomotion policy with using the proximal policy optimization algorithm
- Simulated the successful model in Genesis to visualize the learned gait

Doodle Droid | ROS 2, Image Processing, Computer Vision, Motion Planning

Nov 2024

- Located and processed an image with OpenCV for a 7-DoF arm to draw a live portrait
- Calibrated robot arm using AprilTags to move to correct z height
- Utilized ROS 2 and the MoveIt API to develop a motion planner, including a Cartesian path to execute trajectories

Quadruped Locomotion | Reinforcement Learning, PPO, Simulation, Sim-to-Real

Feb 2025

- Used Proximal Policy Optimization to train the unitree go2 robot dog to perform different tasks
- Created detailed reward functions for the dog to sprint, climb, jump, and strafe

Autonomous RC Car | Convolutional Neural Networks, Behavioral Cloning, Imitation Learning

Jan 2023

- Led development of an open-source autonomous RC car project in Python, with custom hardware
- Created a custom Convolutional Neural Network that predicts steering and throttle based on an input image
- Constructed a controller mapping using PyGame to control the RC car

Interactive Path Planner | ROS2, C++, A-Star

March 2025

- Read SLAM maps to publish an 2D occupancy grid fro universal use
- Published a path between a start and goal node using the a-star algorithm
- Made the markers interactive so the path can be updated dynamically

Sketch Prediction | Python, Deep Learning, PyTorch, Convolutional Neural Networks

Jun 2023

- Created and trained a Neural Network with PyTorch that recognizes a sketch belonging to 1 of 250 categories
- Produce user sketches using a gui interface as input to the model