Portfolio – Reid Merrell

B.S. Computer Science, Minor Mathematics

Brigham Young University

Brigham Young University undergrad graduating in Computer Science with a passion for robotics and computer graphics.

Phone: (385) 450-6536

Email: r4merrell@yahoo.com

Website: https://reid-merrell.dev/

LinkedIn: https://reid-merrell.dev/linkedIn

Duckiebot, *Sept 2025 - Current*

A differential drive robot that uses computer vision to navigate a city, avoid obstacles, and recognize signs to perform traffic functions.

- Created ROS (Robotics Operating System) nodes to handle image processing, control, and navigation.
- Calibrated camera to account for distortion and improve image processing accuracy.
- Used odometry to track the robot's position and orientation.

Tech Stack: ROS, Docker, Python

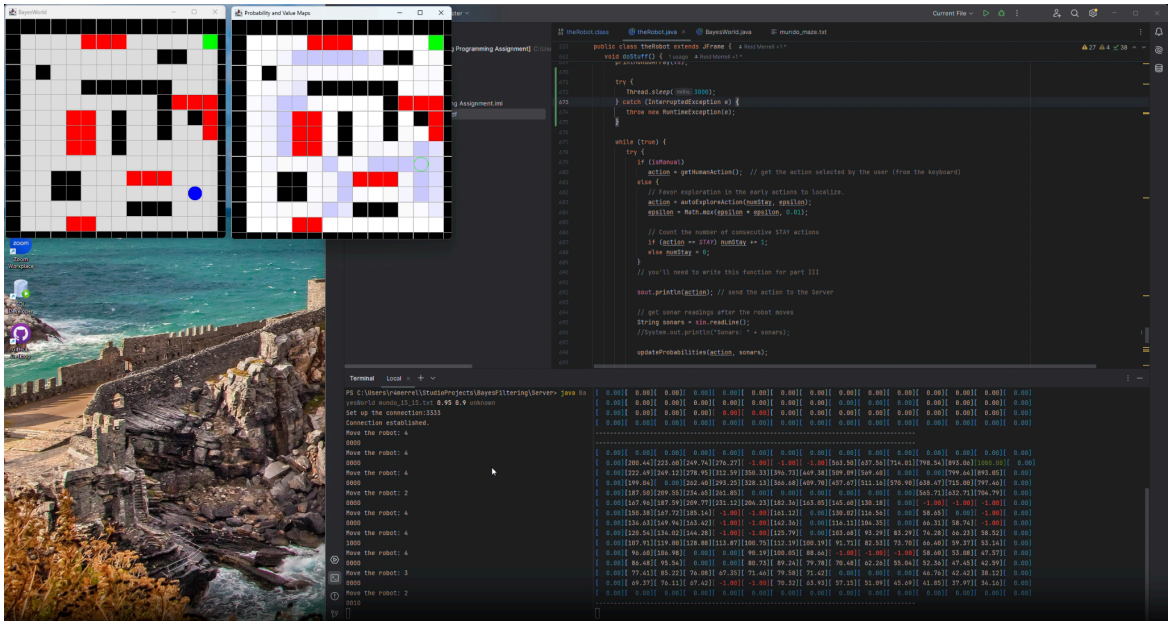
Maze Solving Robot, *Nov 2024 - Dec 2024*

https://github.com/rukar4/BayesFiltering

A program to simulate Bayes filtering for a maze-solving robot using Java.

- Used Bayes filtering to localize the robot, including the sensor and probability models.
- Designed the robot to solve mazes with varying sizes, sensor noise, and movement uncertainty.
- Tuned value iteration to entice the robot to progress to the goal while avoiding obstacles.
- Implemented an epsilon-greedy algorithm to encourage exploration at the start.

Tech Stack: Java



The robot has four sensors to detect walls in each of the cardinal directions. The display shows where the robot actually is vs where the robot believes it is. The robot's belief is shown as a heatmap of probabilities. The darker the blue, the more likely the robot is in that cell. The robot attempts to navigate to the goal (green square) while avoiding obstacles (red squares).

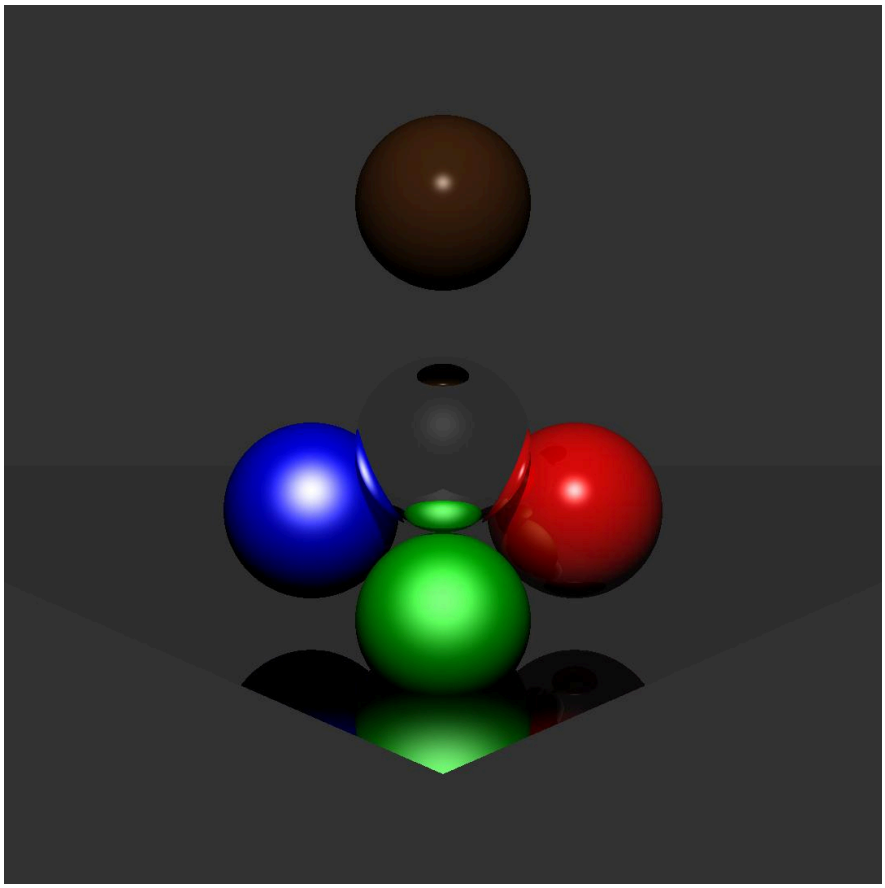
Ray Tracer, *Jan 2025 - Jul 2025*

https://github.com/rukar4/RayTracer

A ray tracer command-line app that takes in a file and generates a PPM image.

- Created a simple parser to read .txt files and generate ray-traced images.
- Calculated ray intersections to determine which pixels to color on a 2D projection from a 3D scene.
- Implemented an abstract class for props, allowing for easy implementation of various shapes.

Tech Stack: C#, .NET



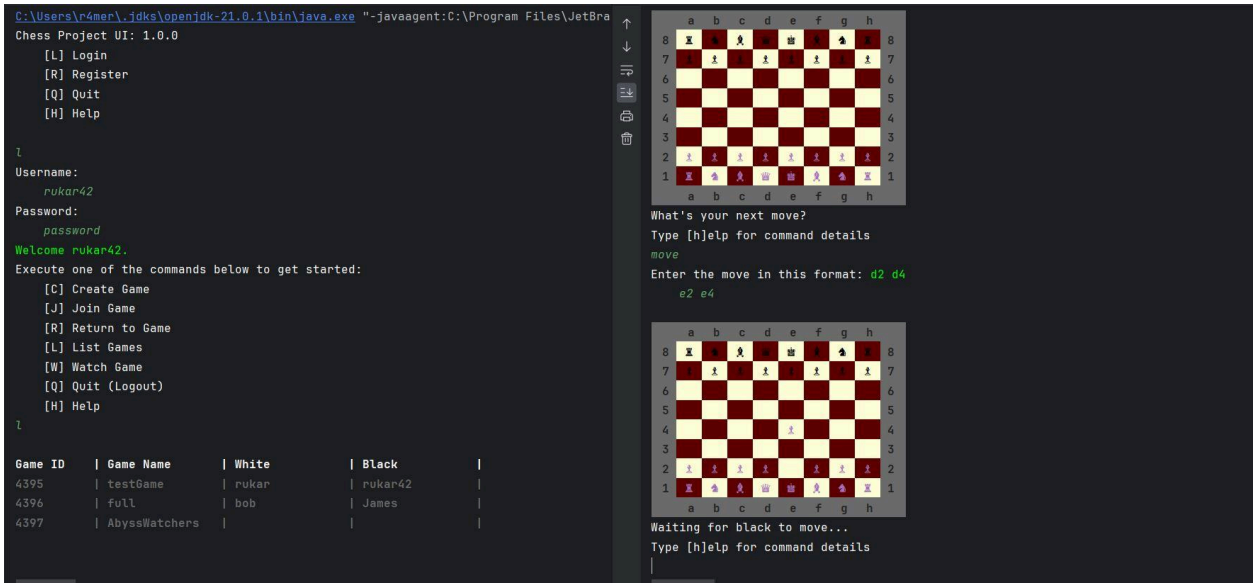
Chess Game, *Aug 2023 - Dec 2023*

https://github.com/rukar4/ChessGame

A chess game server that can host multiple games with a terminal client and a back-end API.

- Implemented all chess rules and game logic in Java
- Built a terminal client for real-time interaction
- Designed a database for game management
- Implemented communication between client and server using sockets
- Created DAOs for database operations

Tech Stack: Java, MySQL



Thank you

Thank you for reviewing my portfolio. You can explore more about me and my projects at my website, https://reid-merrell.dev/, or reach out to me directly through my email or LinkedIn.