

Robotic Gaming Partner

Project Objective

The **Robotic Gaming Partner** is an AI-Accelerated project that integrates computer vision with inverse kinematics in a pipeline that allows a user to play a two dimensional game against the Yahboom DOFBOT on a whiteboard. A user is sensed when approaching the play area, unlocking the ability to interact with the custom GUI screen. The team's developed ADC takes the output from the sensor and converts it to information the Jetson Nano can use. This touch screen display enables the user to select the game of choice to play against the robot, with difficulties included. All components talk to each other via ROS Melodic to deliver a real-time performance.

Motivation

The integration of machine learning with modern robotics is a topic that is prevalent in systems designed today and continues to expand. Having the ability to push the Jetson Nano to its limits and design technology that aids in it's computation allows valuable experience as an engineer before moving on to productionized machines. Seeing our code in action is highly rewarding and motivates us to pursue these areas in the industry.

Components

- NVIDIA Jetson Nano Developer Kit 4GB
- Yahboom 6-DOF DOFBOT
- SICK UM-18218126111 Ultrasonic Sensor
- Wckun 15.6" Portable Touchscreen Display
- Rhino PSC-24-060 Power Supply

Meet the Team



Rhilo Sotto



Antonio Alcalá
(Team Lead)



Giovanni Echeverri



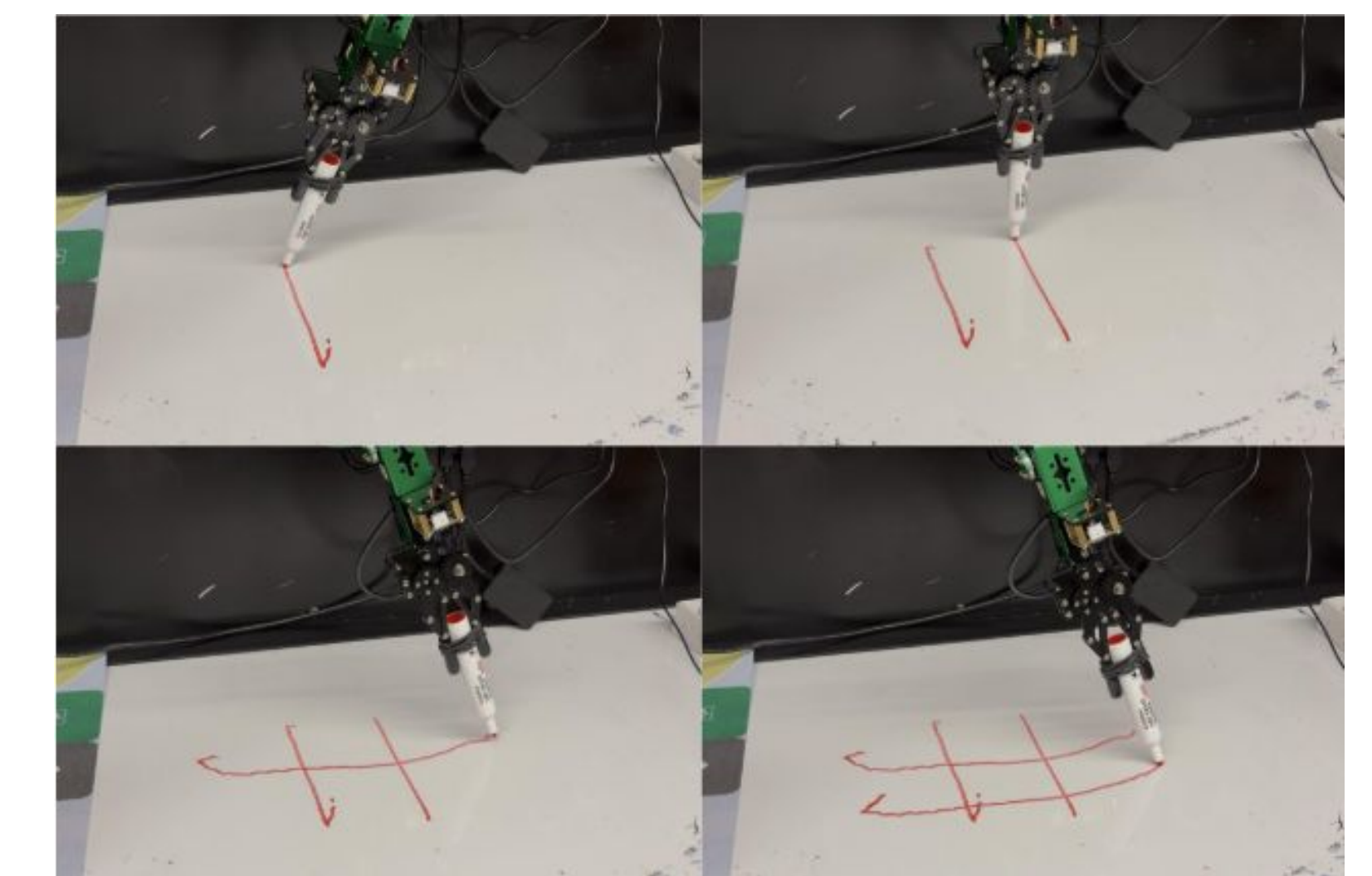
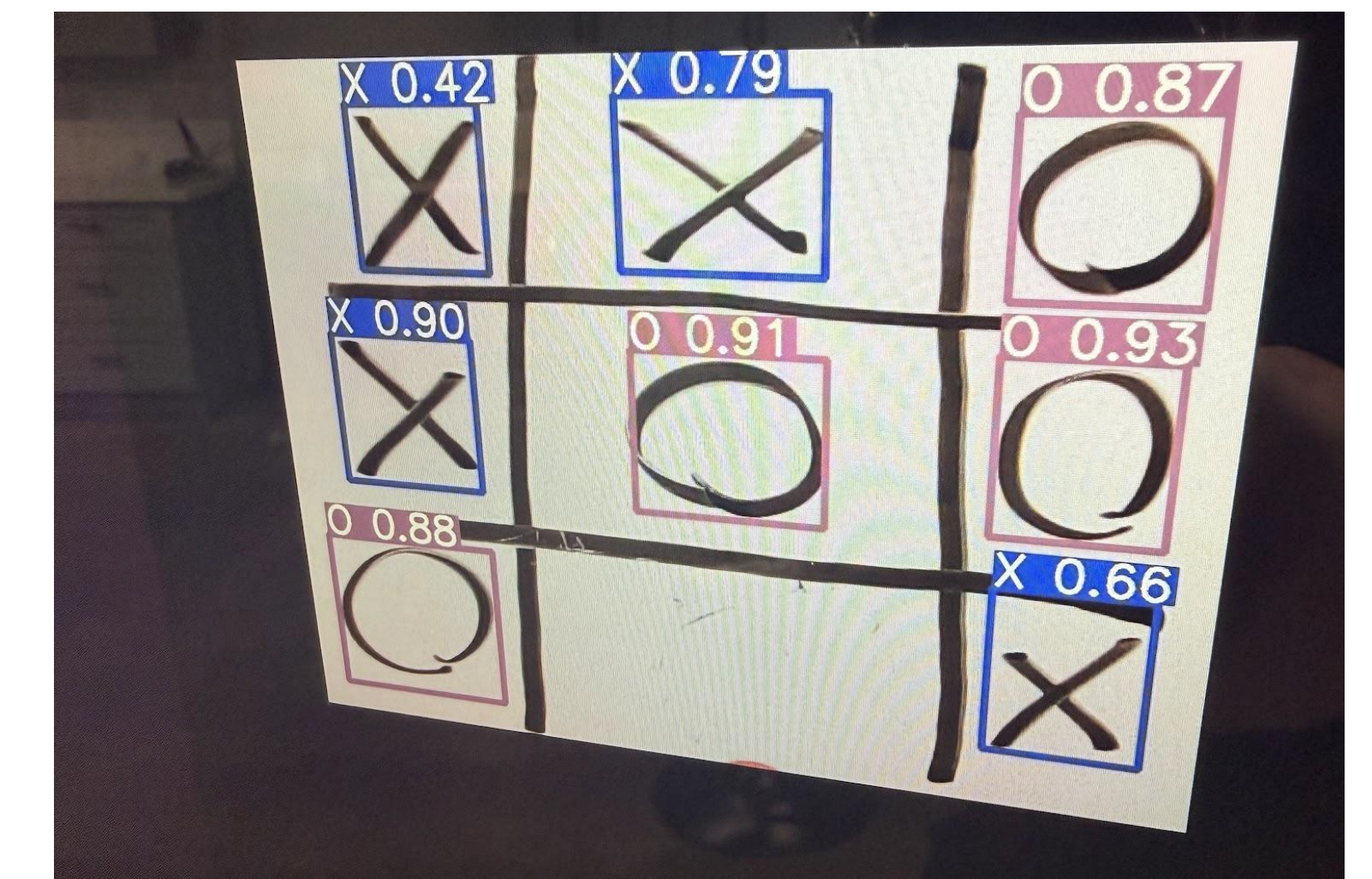
Valerie Joy Pinto



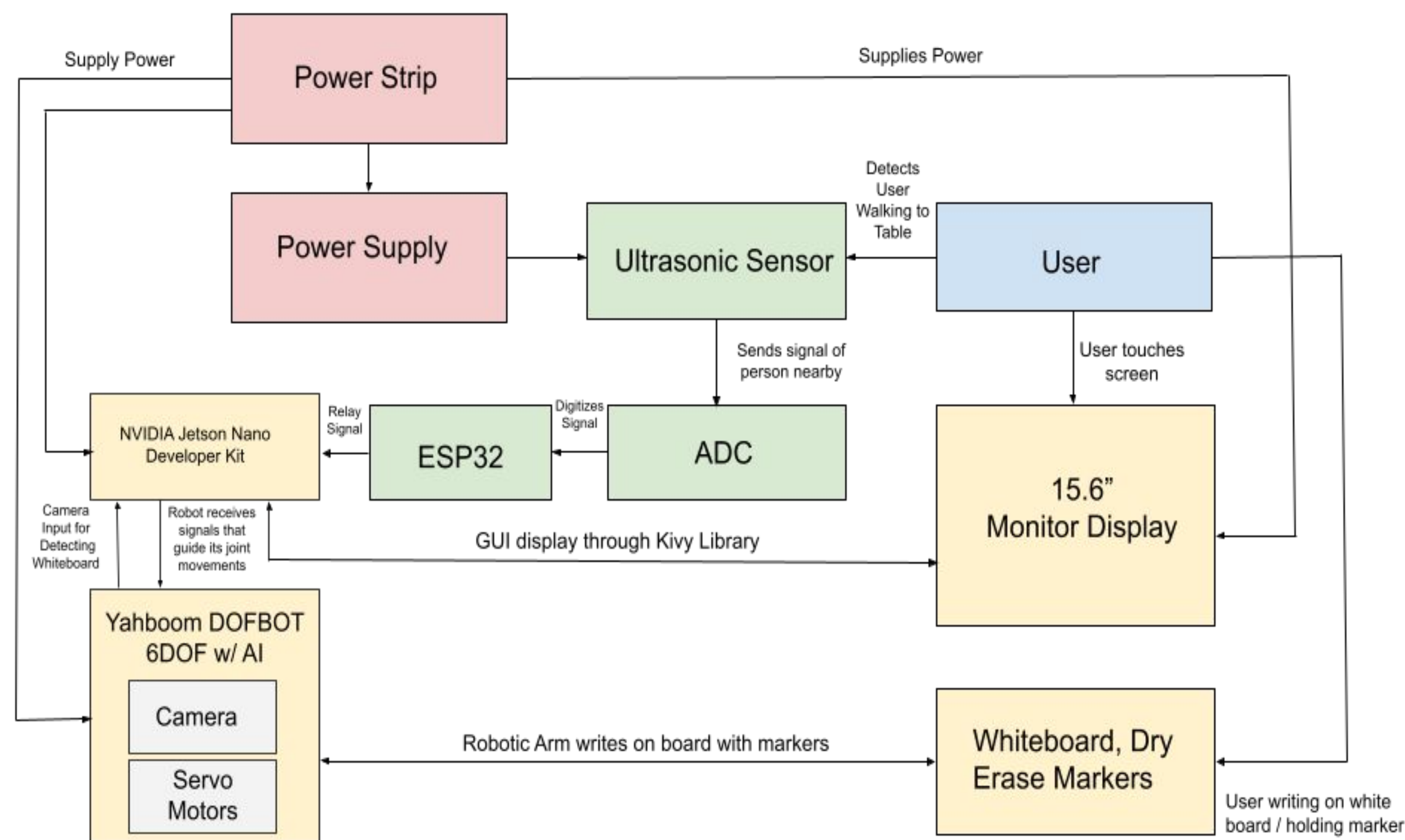
Kevin Saleem



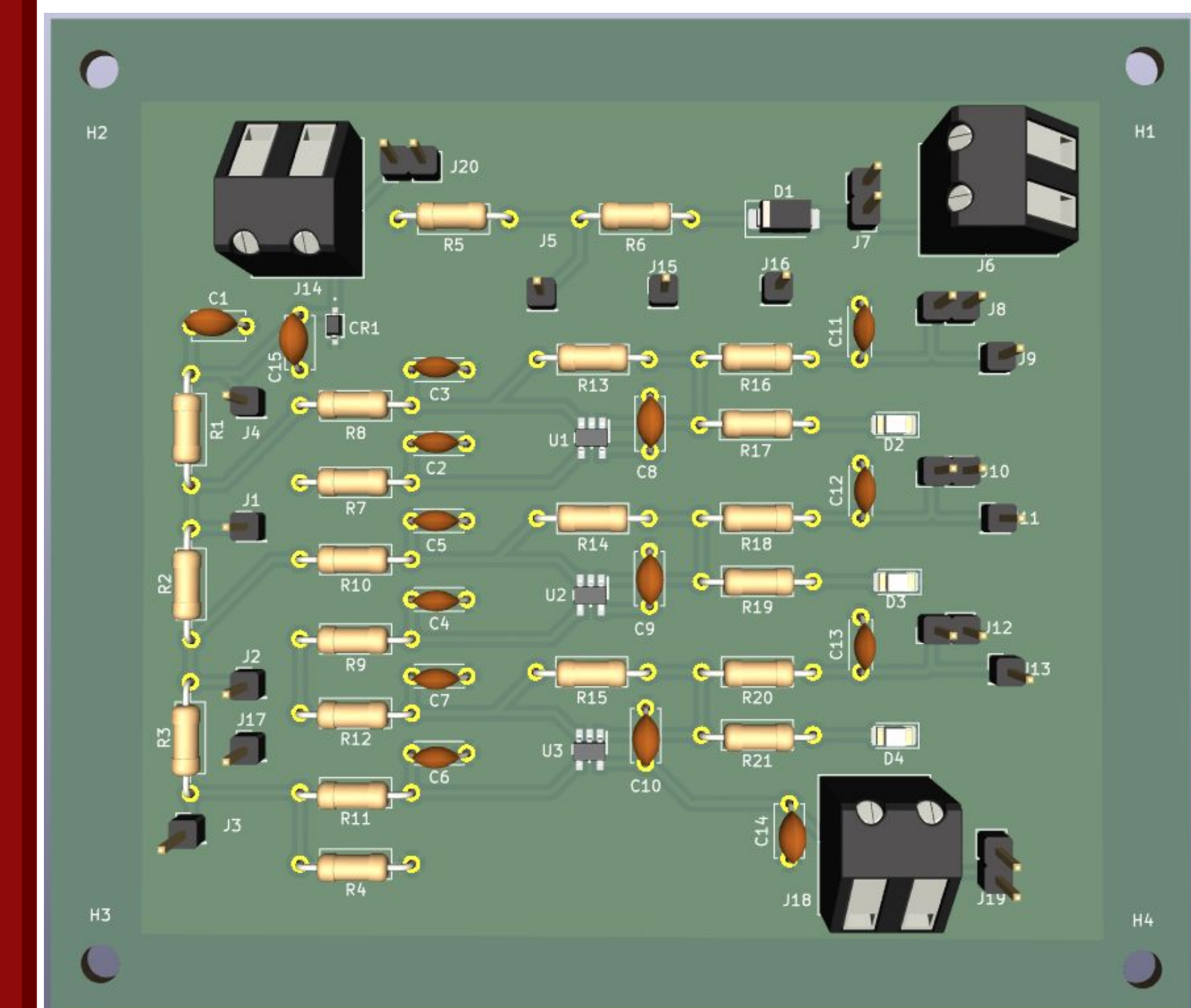
Testing and Verification



System Level Diagram



ADC Board Design



Conclusion

To conclude, the Robotic Gaming Partner project successfully demonstrates the integration of computer vision, inverse kinematics, and real-time AI decision-making in an interactive robotic system. By combining the NVIDIA Jetson Nano, Yahboom DOFBOT, the ultrasonic sensor, and the touchscreen display, this created an engaging gaming experience for users to play 2-D interactive games on a whiteboard.