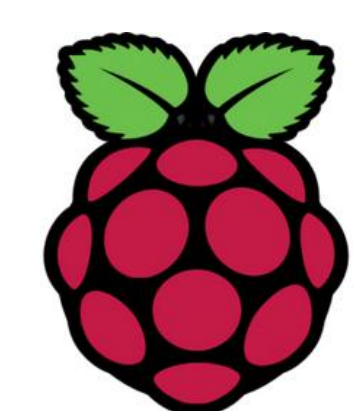


PROJECT OBJECTIVES

- Create a memory game integrating five technologies used in IoT development.
- Base the project on a classic memory game selected by DornerWorks for its recognizability and adaptability.
- Add a mobile “Game Master” to meet technology and connectivity requirements.

KEY TECHNOLOGIES



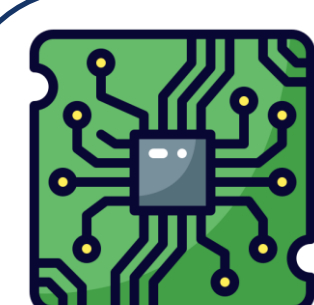
Raspberry Pi CM5
High-performance SoM



Rugix
For building and managing custom Linux devices



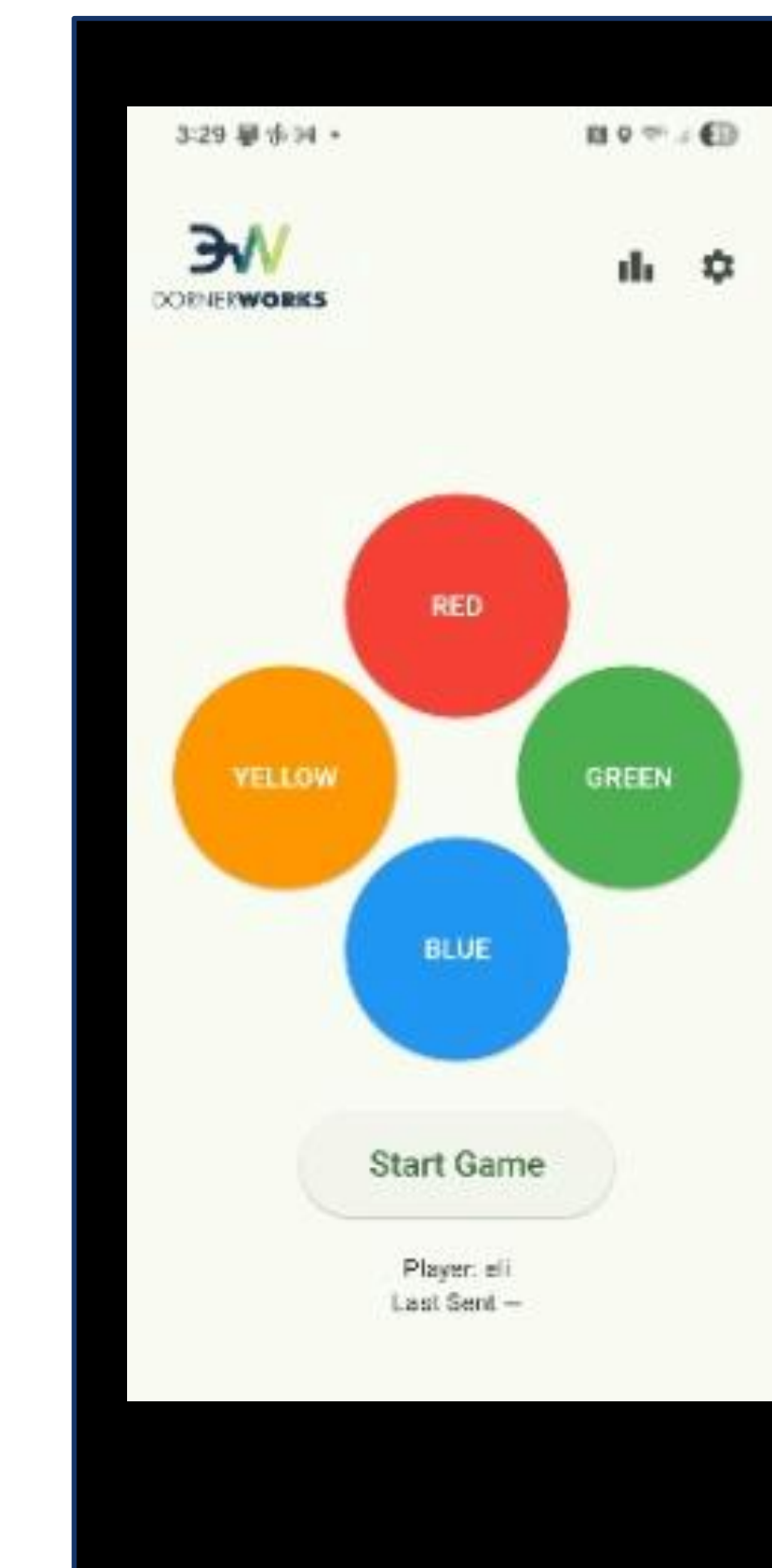
Rust
Memory-safe, concurrent embedded development



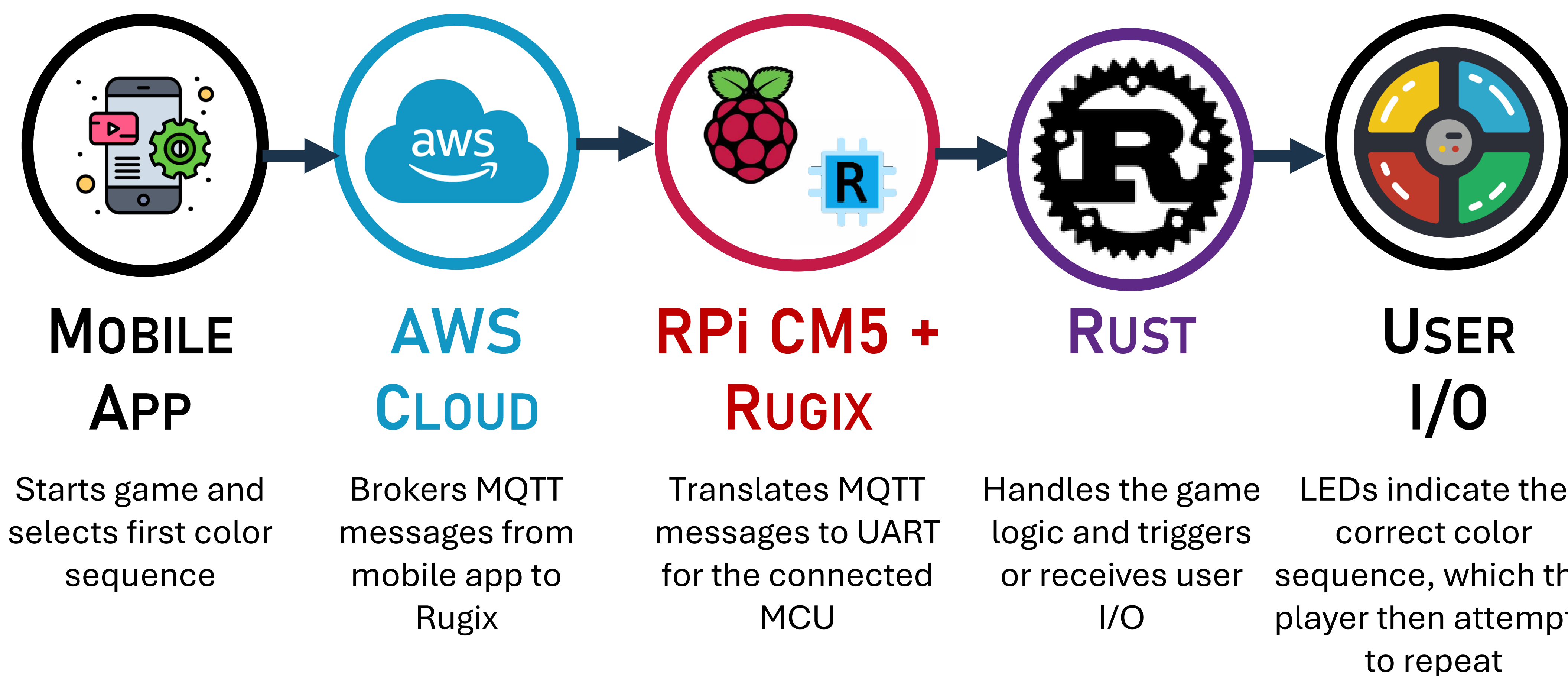
Custom PCB
Integrates the RPi CM5 and MCU running Rust



Mobile App
Cross platform app that builds for Android, iOS, and Web



HOW IT WORKS



After the first color is matched, results are sent to the mobile app and the gameplay repeats – this continues until the player fails to match the full sequence. The final score is then parsed and added to the leaderboard.

PURPOSE

- Create non-proprietary building blocks for future IoT projects.
- Expand DornerWorks’ IoT expertise by gaining experience in less familiar technologies.

RESULTS

CUSTOM HARDWARE: Designed a PCB integrating the Raspberry Pi CM5 running Rugix and an ESP32 running embedded Rust.

RUGIX APPLICATIONS: Developed an onboarding app for receiving Wi-Fi credentials through BLE and a relay app for translating messages between MQTT and UART.

EMBEDDED RUST: Created firmware that controls game logic, illuminated buttons, and processes user input.

MOBILE GAME MASTER: Built a mobile app that generates and sends color sequences through MQTT.

WEB LEADERBOARD: Created a web application that displays player rankings.

TEAM 24 MEMBERS



Quentin Daniere • Eli Enyart
Luke Erlewein • Michael Myers
Olivia Smith

FACULTY ADVISORS



Dr. Krug • Primary Advisor
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