

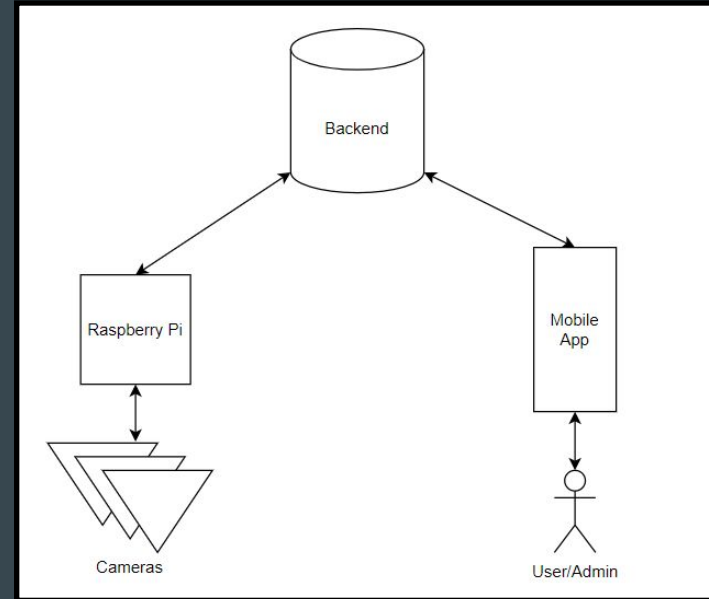
Creating an Automated Parking System Enabled by IoT Technology



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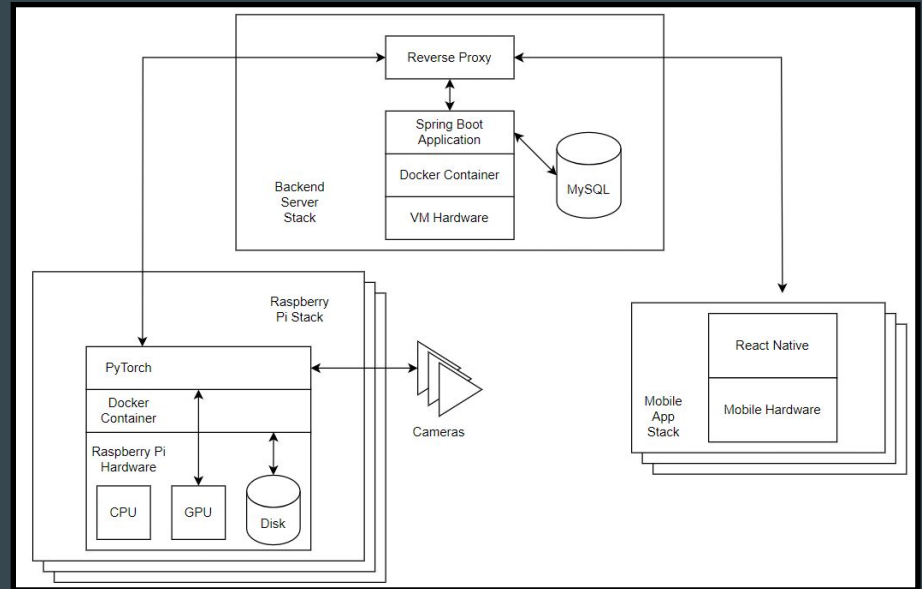
Project Overview

- Smart parking lot system that provides real-time availability and reservation.
- Monitors and manages parking via:
 - Raspberry Pi
 - ESP32s
 - Cameras
 - Mobile App



Project Overview

- Frontend is using React Native and REST API calls to connect to server
- Backend is running a Docker container with a Spring Boot application using MySQL for persistent storage.
- Raspberry Pi receives frames from cameras. Processes using YOLOV8 on the AI Hat.



Problem Statement



- Finding a parking spot is currently inefficient, time-consuming, and frustrating.
- Drivers often resort to circling lots aimlessly, especially during busy hours.
- Unipark will increase convenience, reduce parking search time, and optimize lot usage.

Professional Responsibilities - Security

- Handling sensitive user data (password, payment, and location) requires integrity and confidentiality
 - Storing encrypted data on backend
- Some current areas of improvement:
 - Email verification is not implemented, possible bot vulnerabilities
- Plans to improve:
 - Adding verification mechanisms
 - Having HTTPS encryption standards in all client-server communications



Ethical Challenges

- Privacy
 - Access to images
 - Access to car location
 - Work with law enforcement, parking police?
- Transparency
 - How will individuals in a parking lot know they are being monitored?
 - Will be implemented in public settings
- Bias & Discrimination
 - Training an AI model can lead to inconsistencies, potentially targeting certain cars



Q/A