Intelligent Parking Guidance System – System Architecture

1. Detection

- Parking lot
- Camera
- Parking space detection algorithm
- Occupancy status

The information regarding each parking space of a parking lot contains names, time stamp, coordinates and occupancy status.

2. Localization

- Naming Layer
- Localisation

Data related to each parking space in a parking lot is stored for the purpose of monitoring and managing parking activities.

5. Integration

- Centralised Database system

4. Web UI

- Website
- CURD operations
- Parking Space
  - Time stamp
  - Name
  - Coordinates
  - Occupancy Status

3. Navigation

- Navigation
- Coordinate system
- Custom Maps

The key features of the navigation component include:
- GPS Integration
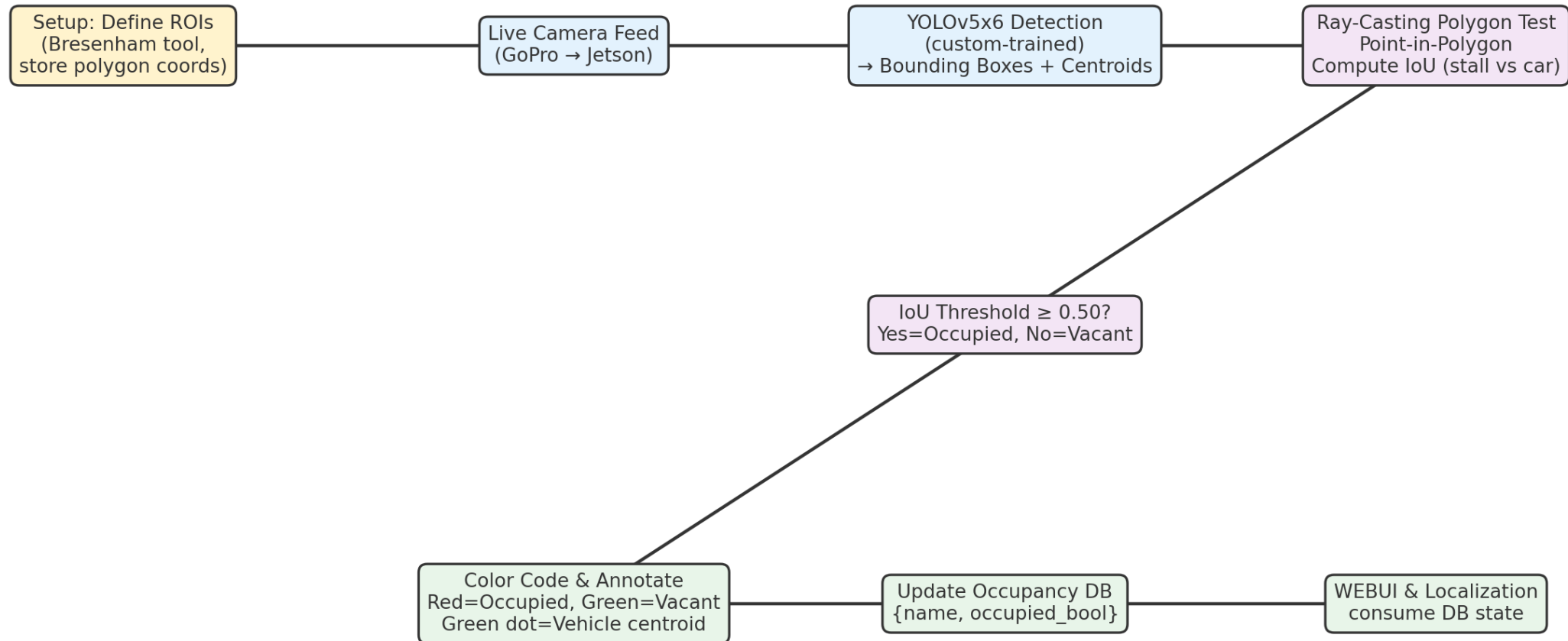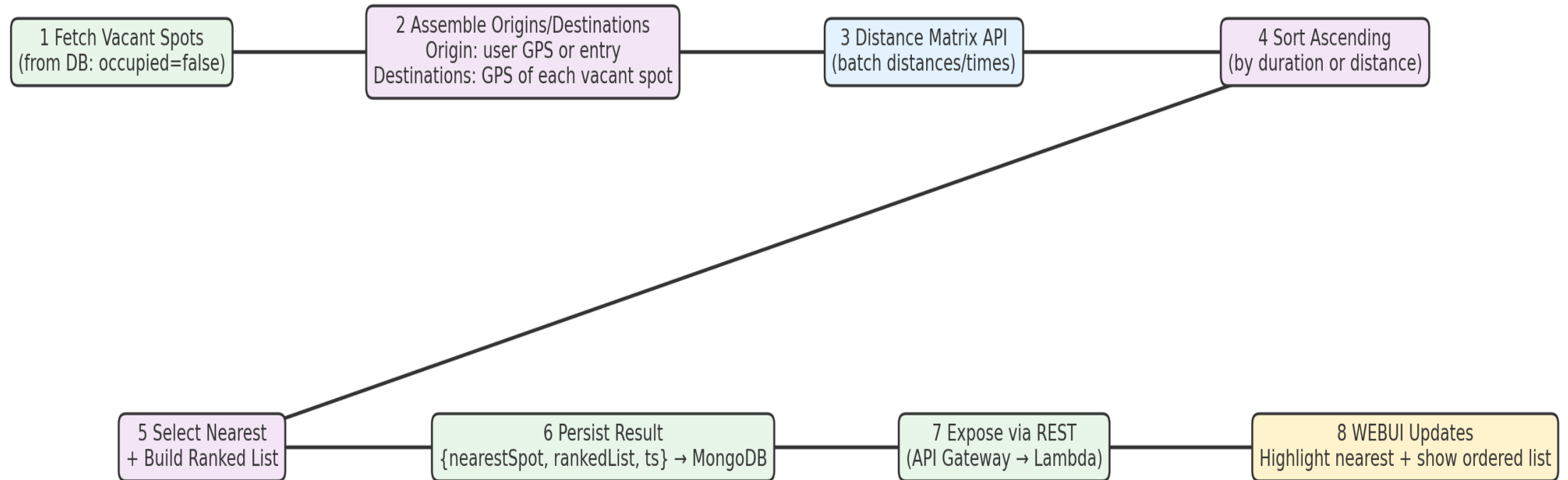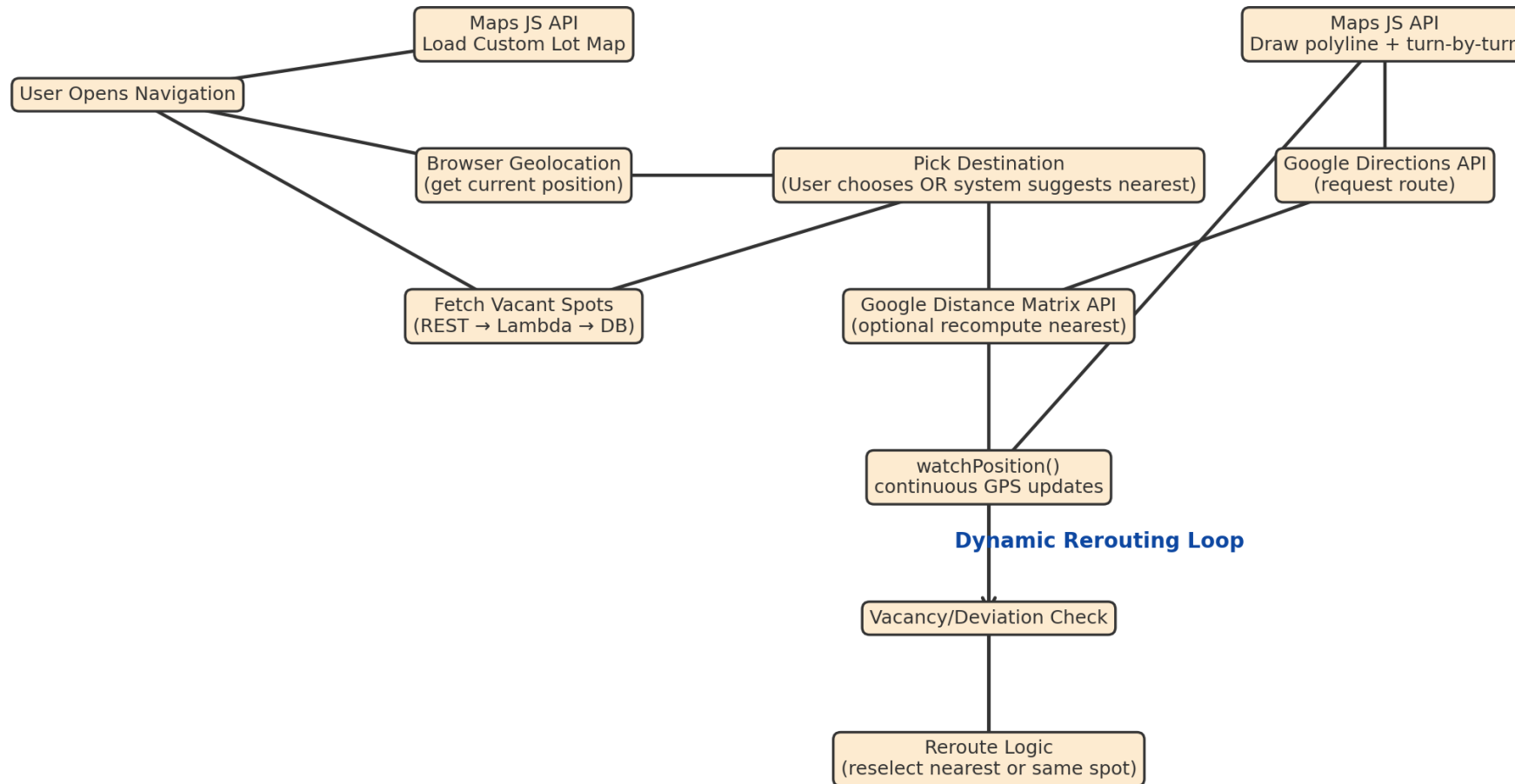- Customized Parking lot maps
- Real-time Navigation

Intelligent Parking Guidance System - Detection

Intelligent Parking Guidance System - Localization
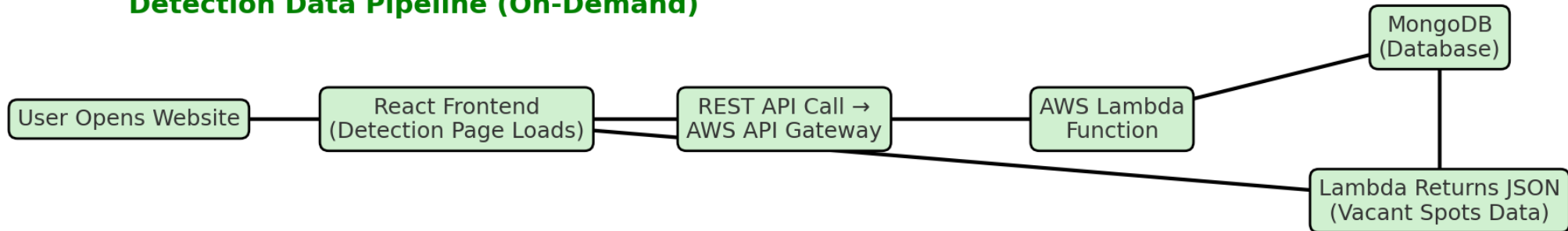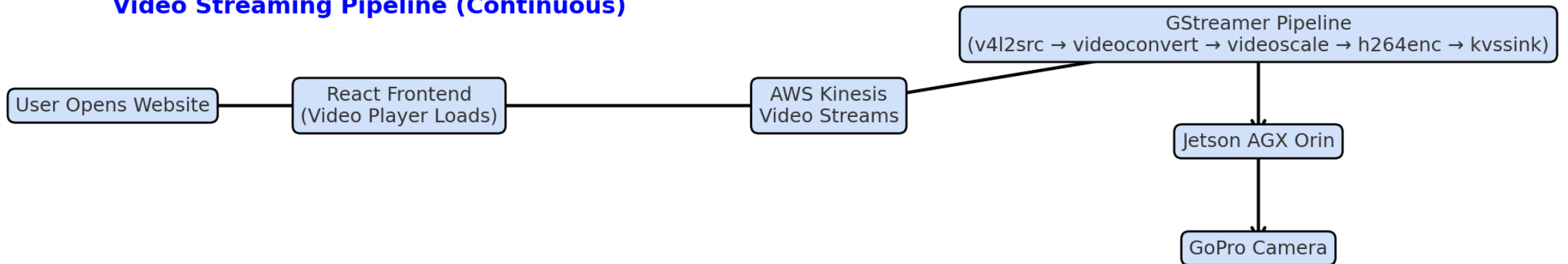
Intelligent Parking Guidance System - Navigation

Maps JS API
Load Custom Lot Map

Maps JS API
Draw polyline + turn-by-turn

User Opens Navigation

Browser Geolocation
(get current position)

Pick Destination
(User chooses OR system suggests nearest)

Google Directions API
(request route)

Fetch Vacant Spots
(REST → Lambda → DB)

Google Distance Matrix API
(optional recompute nearest)

watchPosition()
continuous GPS updates

Dynamic Rerouting Loop

Vacancy/Deviation Check

Reroute Logic
(reselect nearest or same spot)

Intelligent Parking Guidance System - WEBUI

Intelligent Parking Guidance System – Multi-Camera