“Seat” to Enjoy “Ride” — Smart Bus System

An Integrated Real-Time Bus Information Platform with GPS Positioning and Crowding Detection

Research Motivation and Objective Analysis

Motivation: People often find public transportation inconvenient, and current apps mainly provide only basic bus arrival information.

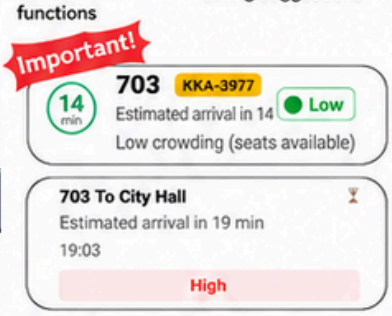
Objective: To solve the problem of information asymmetry by providing “estimated boarding availability” and “crowding level” information, thereby improving passenger experience.

App Interface and Results Display

Main Interface
Displays crowding levels for nearby buses

Route Planning
Provides route recommendations and navigation functions

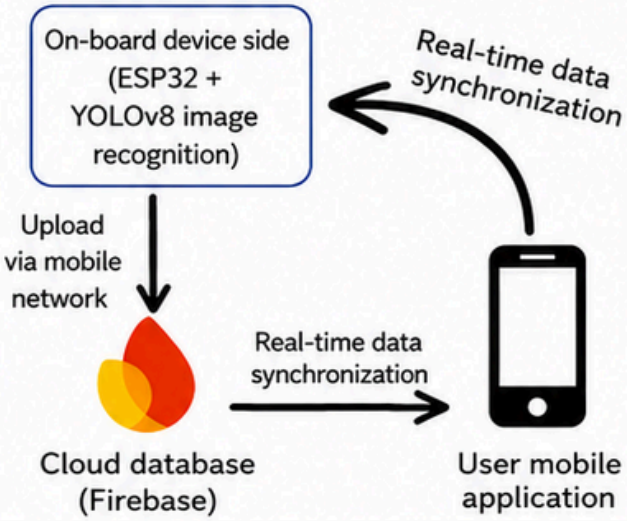
Food Recommendations
Offers nearby dining suggestions



Real-Time Crowding Display
Shows current crowding conditions to help passengers decide whether to board. Also provides bus recommendations for users with reservations.

System Core Functions and Architecture

- Real-time bus positioning (GPS)
- In-vehicle crowding detection (AI image recognition)
- Cloud database synchronization (Firebase)
- Visual presentation on the app (Google Maps)

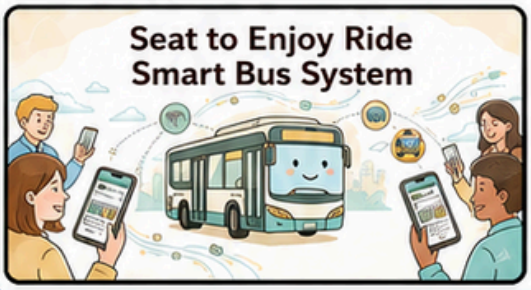


Conclusion and Future Development

- Successfully integrated GPS and image recognition technologies
- Solved issues related to crowding information testing inside buses
- Improved passenger comfort and convenience during rides

Future Prospects:

1. Continue optimizing AI image recognition accuracy.
2. Expand system functions and modules.
3. Collaborate with large-scale field testing partners.



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