

BACKEND DEVELOPMENT FOR AI-BASED HOUSEHOLD GARBAGE COLLECTIONS SYSTEM

PROJECT COMPLETION

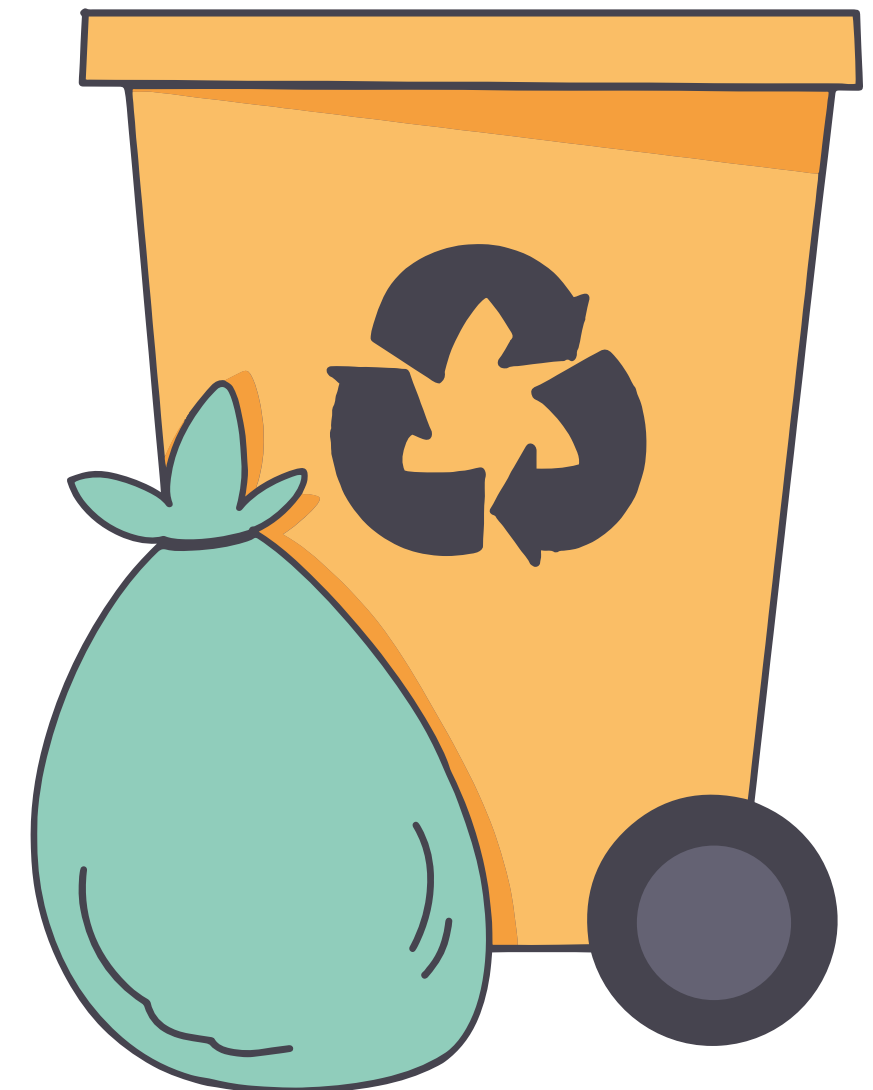
Overall

Necessity of the project is to help households and collectors of household garbage to create clean environment in the streets and get the garbage out before it smells or overflows to the streetside, showing the driver best route where the trash should be collected using the AI based data solution

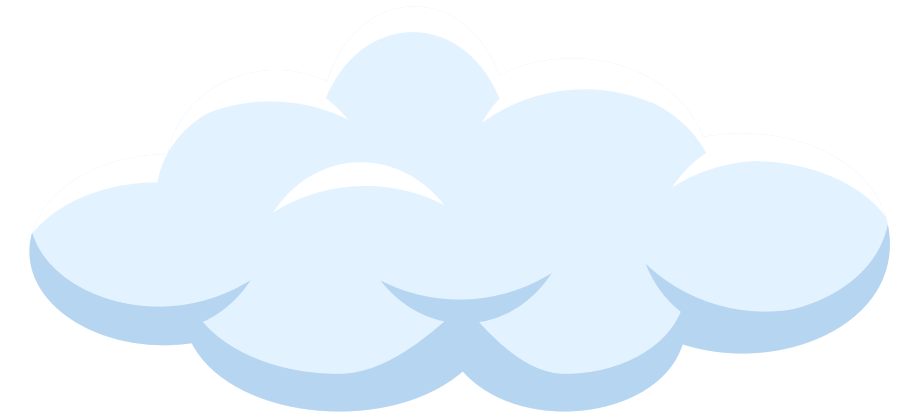
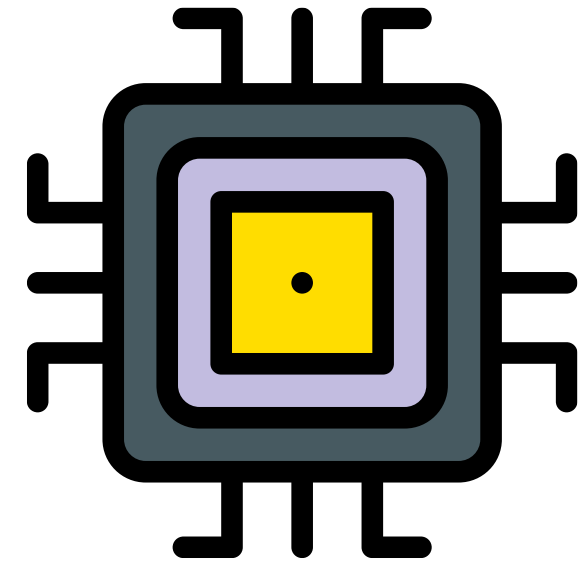
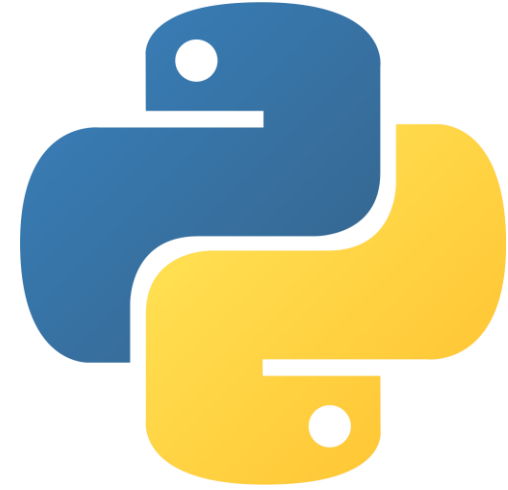
Our part

Backend team was supposed to create reliable server, database, data storage, real-time data streaming, receiving and sending data from AI to GUI respectively. Collecting, Storing and Analyzing the data giving the best and quickest route to the driver were our goals.

PURPOSE OF THE PROJECT



Solution



Python - for main coding, API setting

Linux OS Ubuntu - for running Jetson processor

MySQL&SQLite - for local database

Clever cloud - for storing the collected data



Theoretical & Technical basis

****Language: Python****

- Chosed Python for its diverse libraries, enabling fast and efficient development.

****Code Implementation and Sharing: Visual Studio, GitHub****

- Utilized Visual Studio for coding and GitHub for code management, enhancing efficient collaboration among team members.

****Data Storage and Usage: SQLite, Clever Cloud****

- Used both SQLite for local data and Clever Cloud for cloud data, managing and utilizing data separately for local and cloud purposes.

****Architecture: Implemented Flask Based on Microservices****

- Adopted a microservices architecture using Flask to independently develop each feature, promoting code simplicity and convenience in combining individually implemented code.

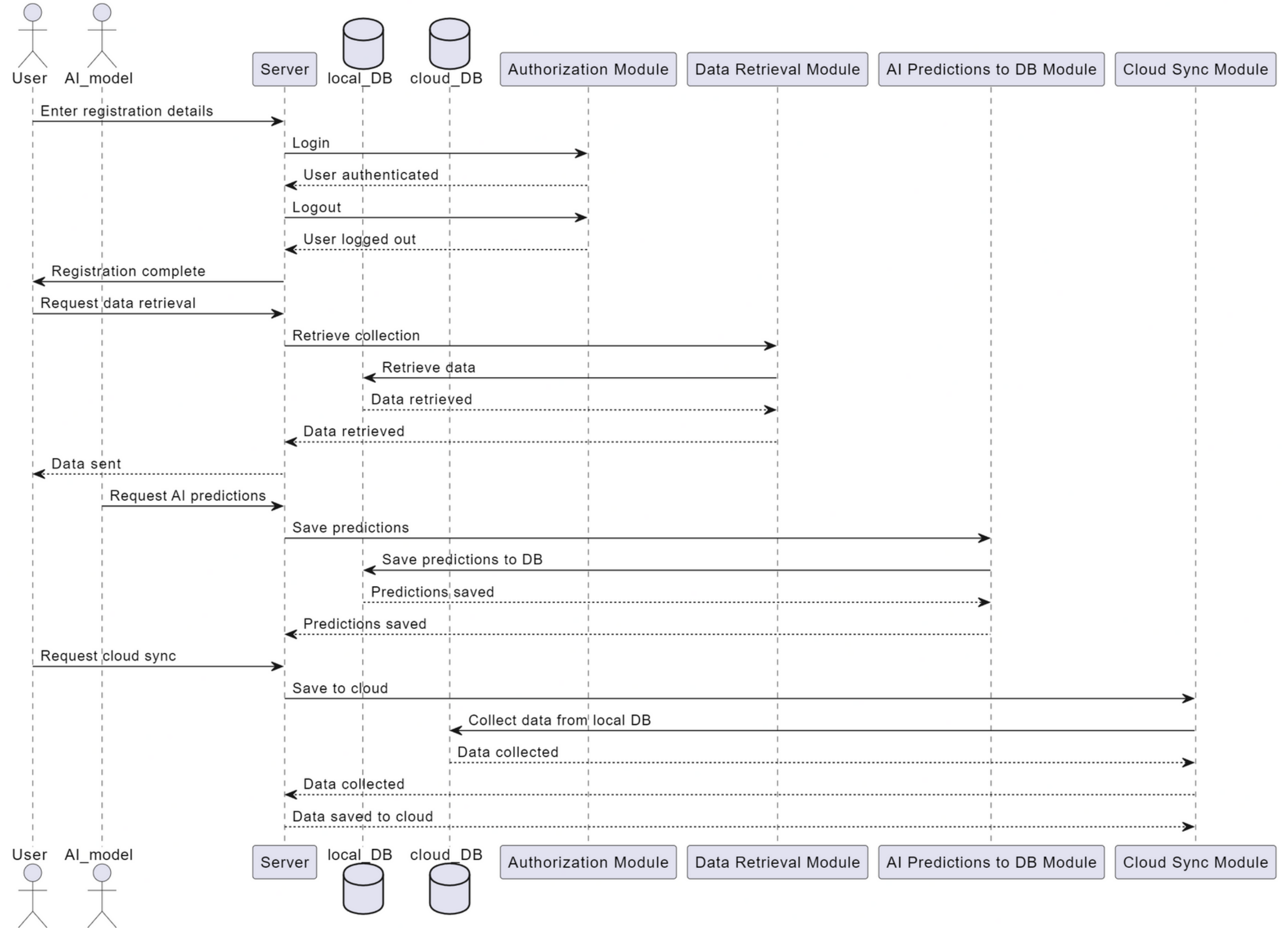
- Establishing a server for user interaction on the front end and communication with the crucial AI model for information exchange.
- Implementation of a server and code for efficient connection and utilization of a database, handling substantial data such as login information and various waste collection data.
- Implementing code to utilize SQLite and Clever Cloud as tools for local and comprehensive data storage, respectively.
- Implementing Flask as a server to handle various functionalities, connecting the implemented features with the front end, AI model, and database.

Features of project Result & Specific project Implementation

- **Token Verification:** Utilizing the JWT token, self-contained token that contains information about the user and is used for authentication.
- **Login:** Receiving information entered by the front end via the POST method, confirming user login details using data stored in the cloud, and generating tokens accordingly.
- **Local Data Storage, Retrieval, and Utilization:** Implementing information storage, updating, and retrieval using POST, GET, and PUT HTTP methods. Additionally, implementing various SQLite functions for each feature.
- **Operation of AI Model:** Implementing server code to enable the AI model to operate once the application starts after login using the POST method.
- **Cloud Data Storage and Retrieval:** Implementing code necessary for tasks such as transferring local data after login and handling cloud storage upon shutdown.

Backenders

Features of project Result & Specific project Implementation



Backenders

Expected effect & Utilization plan



Practicality

Very high practicality in urban areas of the city, easy to implement, more work efficiency



Marketability

Excellent product for Korean market as it is real solution to real problem which can be seen everyday



Economic Feasibility

Cost: not measured yet
ROI: positive return
Legal considerations: support by government

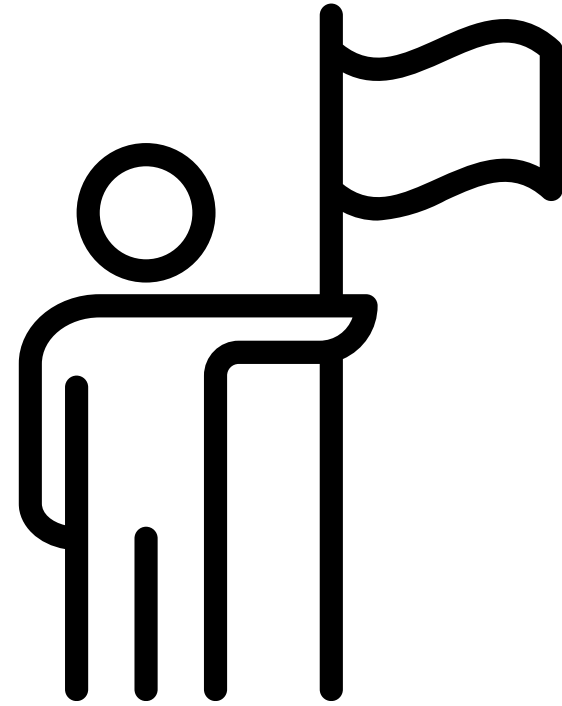


Commercialization

Approximately 1 year to develop fully working product and to enter the market

About The Product

Our Great Team



Ernist Seidiakmatov

Team Leader

Team Leading assisting the development, coding, reviewing the code, and testing.

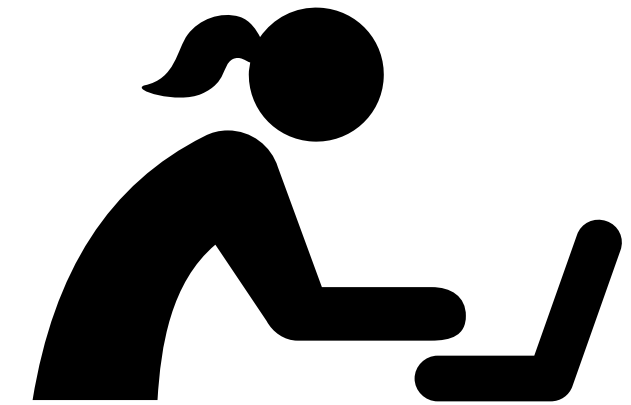
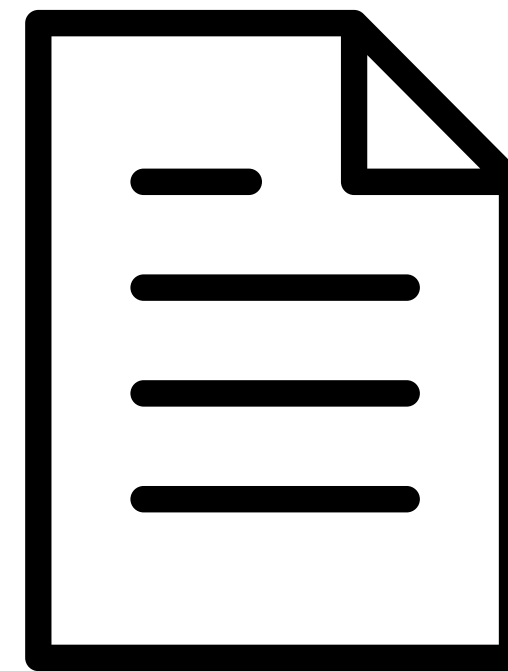
Oybek Matkosimov

Research and paperwork, writing reports and other document



Ko Jeonghyeon

A bit of coding and research



Hwang Eunji

Coding, researching and developing System Architecture

THANK YOU

COMPLETION PRESENTATION