**Team Contribution**

**Team 5**

* **Ye He (2966900H)**
* **Yuan Zhao (3026815Z)**
* **Hao Wu (2982755W)**
* **Xiaoyun Ma (3010324M)**
* **Zhaojie Zhu (2982461Z)**

This project was collaboratively developed by a team of five students, divided into hardware and software sub-teams. The roles and responsibilities are as follows:

**Hardware Team**

**Ye He (2966900H)**

* Assembled the complete circuitry of the smart car, including Arduino, L298N drivers, ultrasonic sensors, and motors
* Installed and tested the Raspberry Pi V2 camera module
* Managed power distribution, wiring layout, and hardware integration

**Yuan Zhao (3026815Z)**

* Supported motor control and ultrasonic distance testing
* Assisted with system calibration and ensured stable hardware operation
* Helped optimize the camera mounting position for better visual detection

**Software Team**

**Hao Wu (2982755W)**

* Led the development of the main control logic on the Raspberry Pi (C++), including multithreaded serial communication, mode switching, and command transmission
* Implemented ArUco marker detection logic and mapped visual data to motion commands
* Integrated the image recognition module with the control system into a cohesive structure

**Xiaoyun Ma (3010324M)**

* Handled the testing and debugging of the image processing module using OpenCV to detect ArUco markers and compute their positions
* Evaluated the follow-mode behavior and analyzed tracking errors
* Assisted in tuning visual recognition parameters such as detection tolerance and refresh frequency

**Zhaojie Zhu (2982461Z)**

* Developed the web-based control interface using Python and Flask, mapping web inputs to serial commands
* Designed the frontend UI and deployed the service on Raspberry Pi at port 8888
* Coordinated communication between the web interface and the main controller to improve user experience