**# Project Documentation**

**## Project Overview**

**The project involves a team consisting of Haozhe Lv, Weizhou Tian, and Luxi Liu. Our work is divided into three main parts: model training, interface integration, and GUI development. The project's objective is to create a system capable of image recognition and controlling a car.**

**## Model Training**

**During the model training phase, Luxi Liu was responsible for image identification and labeling using Labellmg. The specific steps involved were as follows:**

**1. Creating two folders, one for storing images to be identified and another for storing text exported after recognition using Labellmg.**

**2. Storing the images to be identified in the "image" folder.**

**3. Storing the recognized text in another folder alongside Labellmg. These two folders together formed the dataset for training the YOLOv8 model.**

**## YOLOv8 Model Training**

**Haozhe Lv and Weizhou Tian were responsible for training the YOLOv8 model. Their main tasks included:**

**1. Writing the relevant code for training the model.**

**2. Importing the dataset into the model for training.**

**3. Achieving a good recognition effect.**

**## Interface Integration**

**In the interface integration phase, our tasks included:**

**1. Receiving video streams transmitted by telecommunications engineering and management majors.**

**2. Importing each frame picture from the video into the model for prediction.**

**3. Passing the results to the terminal to generate signals to control the car.**

**4. Transmitting the predicted video stream to the database of the e-commerce major based on the Flask framework.**

**5. Implementing a function: if the car captures the same picture for five consecutive frames, it will automatically take the picture and store it in the e-commerce major's database.**

**## Graphical User Interface (GUI)**

**We also developed a GUI with the following features:**

**- Functionality for manually saving images.**

**- Outputting detected item categories in a text box.**

**- The left window displays the video captured by the car's camera, and the right window displays the labeled video.**

**- The ability to freely adjust confidence levels.**

**## Camera Connection Issue**

**Due to a problem with the car's connection, we demonstrated it using a GUI camera.**

**This documentation provides an overview of the project and details the tasks and responsibilities for each part. It serves as a guide for team members and others to understand the project's progress and work involved.**