



Troubleshooting Robot Car

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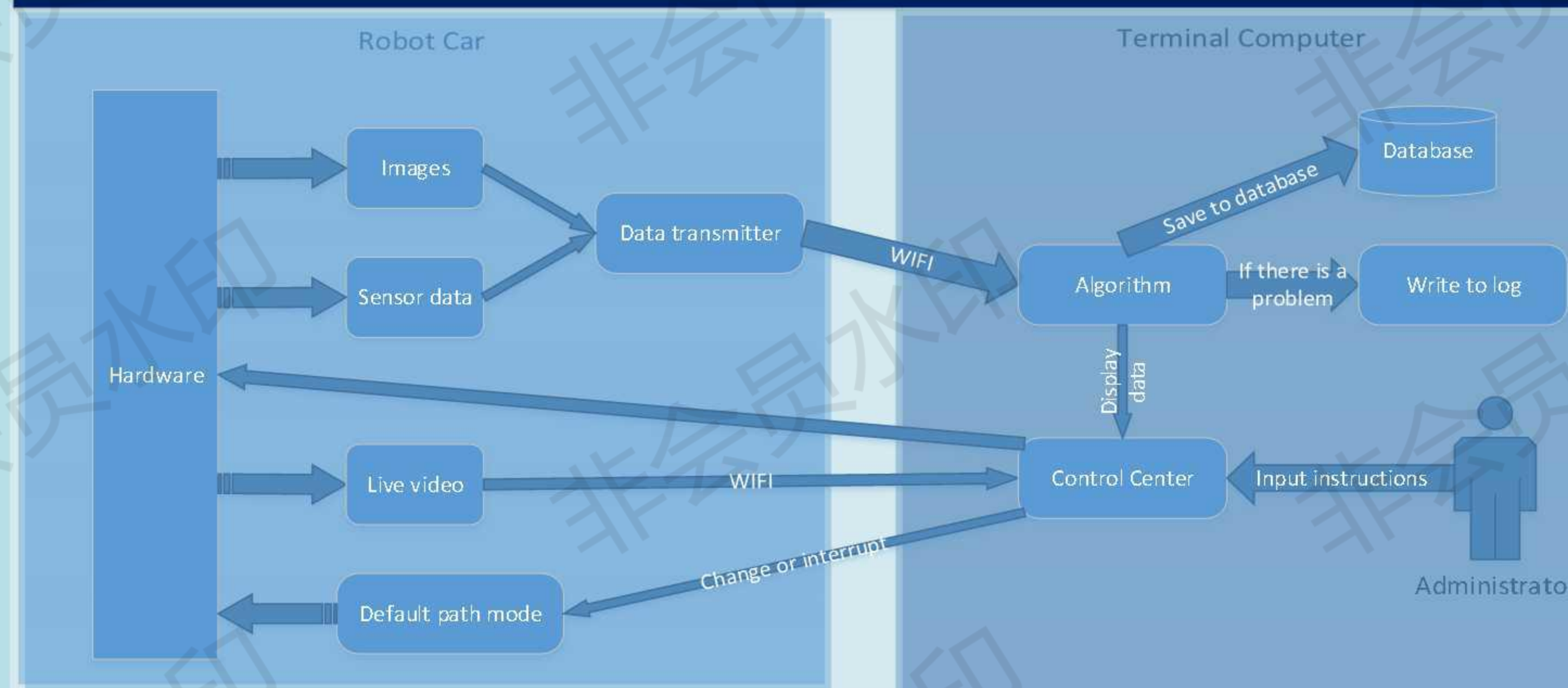
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Introduction

There are many devices need to be maintained everyday. For example, gas leak has to be monitored every day and reduce the risk of much more huge risks. That's the reason why we proposed this Robot Car with many sensors, including camera. We are dedicated to building a platform for better monitoring the abnormality in various kind of factories.

Getting data doesn't mean problems are solved. We will also building a website to provide a platform for user to interact with the Robot Car. In this website, the user can adjust the normal ranges for the sensor data, like temperature.

Software Architecture



Future Goals

At the end of Fall Quarter:

Building the working environment for programming, since three of us dealing with software. A simple way of doing this is putting all codes to GitHub and make the Raspberry Pi available on the Internet. So it will be much easier when testing software with hardware. And also we will add more functions to image processing part. The camera will detect more complex situations then.

In the Winter Quarter:

Implement all functions, test, debug.

Members Concentration

Name	Concentration
Hao Yuan	Image processing
Yijian Wang	Hardware manufacturing
Zheng Wang	UI and automatic path finding
Daben Wang	Website Back-End and database

Currant Progress

Hardware

Finished the main body part of the car. Used Acrylic Plates to build the base and frame. We are planning to set up the whole system based on Raspberry Pi 3, put it at the center of the car.

We use a 16-Channel 12-bit PWM driver to control 3 servos(Tower Pro Micro Servo SG90). One for change the direction of the car and make a turn, and used the other two servos to control the direction of camera by stacked them together and build a 2-D system for the USB camera, connecting with the Raspberry Pi directly.

A 3.7 Volt battery case was fixed on the back of the car, the wire go through a step-down DC0DC converter module and connected with two modules, the Raspberry Pi and an L298N DC motor driver which is used to control two motors.



Software

We have done part of the image processing source code, it's about using binarization to detect the burn marks on the target device. And also, we have developed a user interface for monitoring the data collected by the Robot Car. However the functions are not implemented yet. We have created database tables.



Binarization for burn marks



Web UI for all information

