

IOT HW 3 Documentation

Percentage of Contributions

- Jay Parmar - 25%
 - Prajesh Singh - 25%
 - Luc Tran - 25%
 - Randy Jaouhari - 25%
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How the entire system works

The system works by collecting and splitting the sample from the MPU 6050 and splitting the range of sample to 10 pieces. After this, these piece are published to the *doorData* topic. The classifier code running on the cloud is subscribed to this topic and receives this data. Once the data is received, it is run through the classifier. Once the data is classified, the classification is published to *doorStatus* topic. This is received by the laptop as it is subscribed to *doorStatus* topic.

Feature Extraction and Selection and Training

We decided to use all axis of the gyroscope and the accelerometer as they were all changing when moving the door. We collected samples from opening and closing the door and split it up into 10 smaller sets of samples. We then took the median of the data as it is more resistant to outliers. After this, we added these 10 values to our training dataset. Then we generated the classifier model using SVC using the gaussian kernel as it was suggested by Dr. Shazad in the video. When training, we split our training and testing data 80:20.

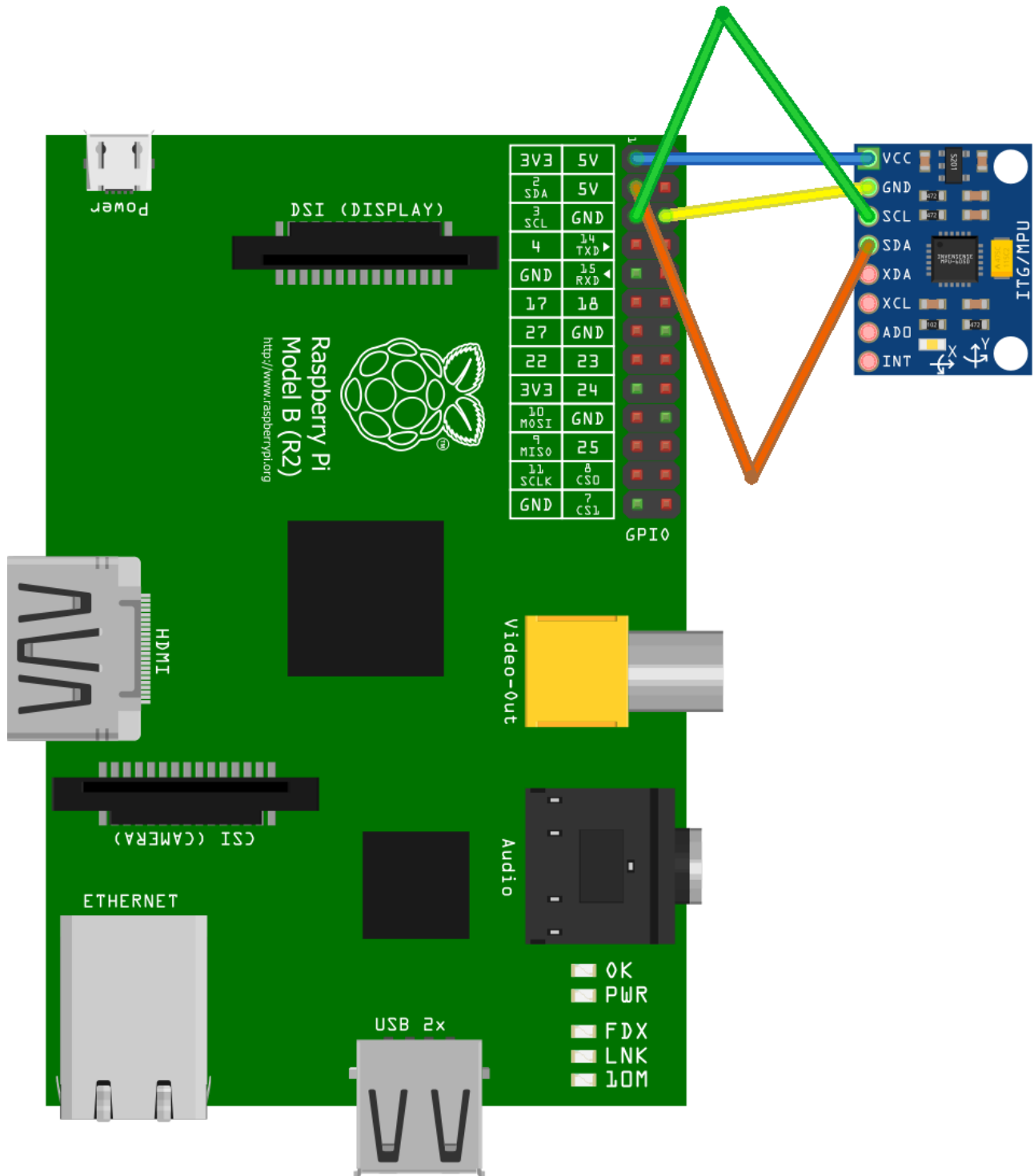
What Each Team Member Did

| Subtasks | Jay Parmar | Prajesh Singh | Luc Tran | Randy Jaouhari |
|-------------------------------------|------------------------------|-------------------------|----------|----------------|
| Collect data and training the model | Code for splitting data into | 1. Code for reading the | N/A | N/A |

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|--------------------------|-------------------------------|-------------------------------|---|---|
| | smaller values | data from MPU sensor | | |
| Laptop Code | N/A | N/A | Code to receive the data from the IBM cloud | N/A |
| IBM cloud code | Wrote part of the server code | Wrote part of the server code | N/A | Uploading the trained model to IBM cloud and setup the run-time environment for the server code |
| Raspberry Pi code | N/A | N/A | Code to send the data to IBM Cloud | N/A |

Schematics Diagrams

Raspberry Pi Connected to MPU 6050



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