IntelliDriver

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Project Goal

The goal of our project is to collect the data regarding the drivers' physical condition that may affect the driving behavior. Using the collected data, we are planning to use machine learning technology that provides various services including better driving environment, risk management, and more.

Background

A lot of studies and research for autonomous vehicles focus on getting data on the car's state instead of the driver's. We want to incorporate data from the driver to determine whether the person is capable of driving or if something needs to discourage them from driving. Autonomous vehicles can become smarter knowing not just what's going on around them, but also how the driver is feeling. By determining the state of the driver, we can take necessary actions to prevent possible accidents on the road.

Materials

- Raspberry Pi
- Sensors & cables/wires:
  - Adafruit Force Sensitive Resistor
  - Smart watch
  - Muscle Sensor
- Gaming steering wheel and pedals
- Smart phone
- CARLA

Accomplishments

- Getting familiar with CARLA
- Setting up circuit for force sensor
- Sending data from sensor and CARLA to
- server

Figure 1. CARLA UI

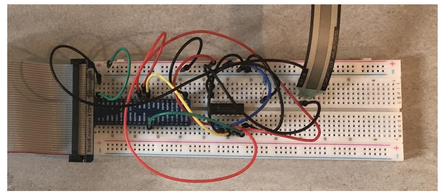

Figure 2. Force Sensor Setup

Future Work

- Create own CARLA simulation (personalize it)
- Set up remaining 2 sensors when they arrive
- Implement Adaptation Recommendation

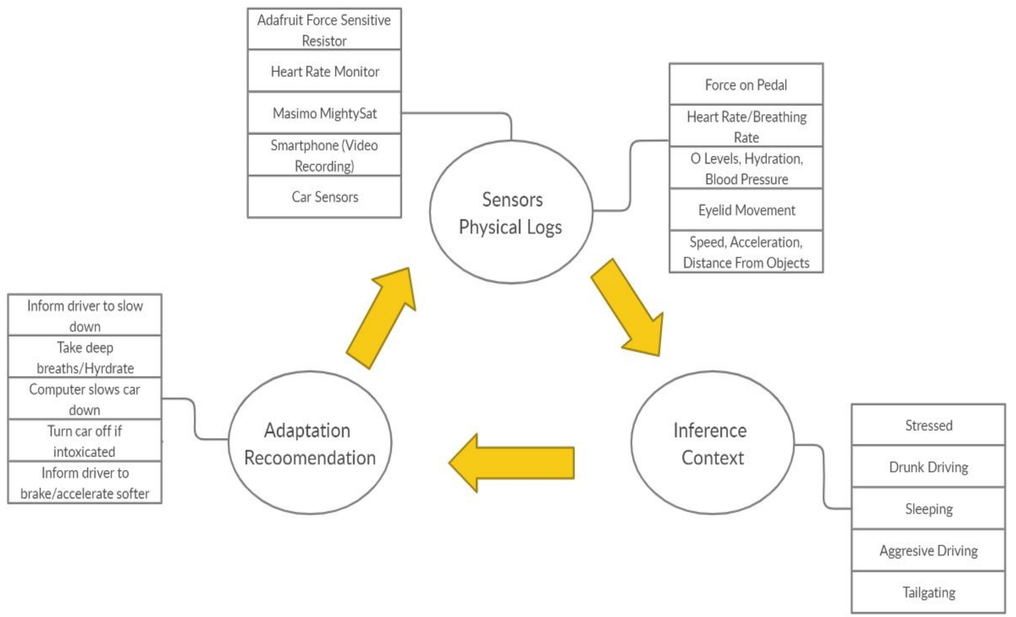

Figure 3. IntelliDriver Flow Diagram

Future Work

- Create from scratch a driving scene using CARLA with cars and pedestrians
- Detect distance from each lane marking and steering angle
- If car is drifting, implement some change to get car back within the lane
- Implement heart rate and muscle sensor

Milestones

Q1: Be able to successfully collect data from sensors and send data to CARLA asynchronously

- Normalized and standardized data
- Analyze the data to determine driver's state
- Create our own CARLA scene for a specific scenario

References

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