

DriveSafely

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What is DriveSafely?

It's an application that takes a picture of the person sitting in the driver's seat as soon as the car turns on using a camera. Every user has an account which he logs on to whenever he wants to use his car. Every user defines several drivers in that account for a customized insurance policy, which depends on his age and on the terms decided by the user and the insurance company.

The picture taken by that camera is sent to azure cloud and compared with the photos of all the users in that account. If the cloud doesn't identify that picture (the driver), the insurance will not be valid for that specific driver and hence the drive won't be legal if he uses the car.

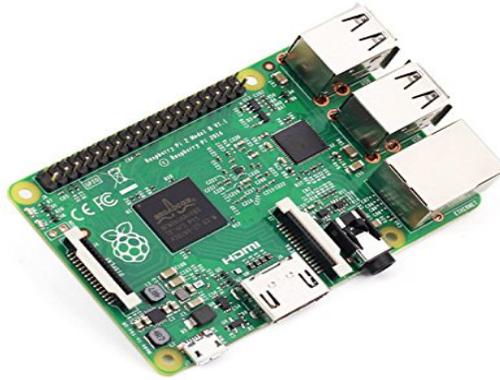
Otherwise, the cloud adds up that day in which that driver has drove to compute the money that user should pay at the end of the month.

Hardware:



1) **Raspberry pi 2.**

– running
Windows 10 IOT
core operating
system,
connected to a
usb camera and
a uwp app



2) **Usb web camera.**

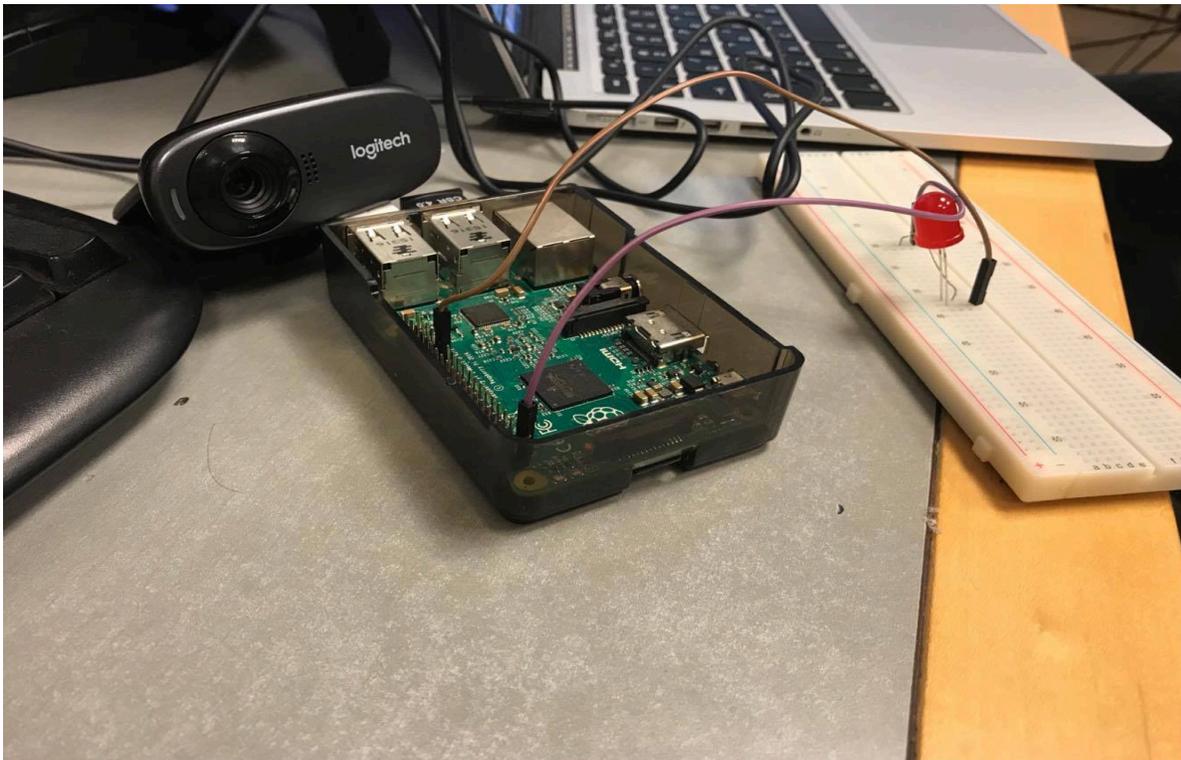


3) **OBD-II** – Bluetooth device connected to a car and paired with the raspberry pi to collect car rpm information)



4) **LED**

This is how it looks:



How does it work:

When the raspberry pi is connected, it searches the Bluetooth devices for “ODB-II” device.

monitoring the connected car's RPM data to determine whether the car is turned on or not.

While the car is turned off the device will check for a signal each 5 seconds. when the car is turned on then the device activates the attached camera and analyzes the snapped camera frame to detect and recognize the driver using Azure Face API compared to the determined whitelisted groups defined by the user.

If there is no detected driver the device will try for 3 times until finally sending that there is undetected driver (for the future turning car off or alerting the cars main driver)

When the device detects a driver a Red LED lights and then it stores the driver's information on an azure storage account table.

The Client Side:

The user connects to the DriveSafely.azurewebsites.com to see this month's drivers list. Or to get all time drivers list.

Server:

- **Storage account Database** – Storage account table contains detected drivers' names and the drives date and time.
- **IoT Hub** - a component responsible for communicating with the RP2 - it allows to perform device-to-cloud and cloud-to-device telemetry.
- **Cognitive service (Face API)**- we used face API service to detect drivers name out of the accounts drivers groups.
- **Web APP** - display a table view of last month drivers or all time drivers
DriveSafely.azurewebsites.net

Difficulties we faced:

The main difficulty was developing an UWP app on a raspberry pi and Azure cloud services since we had no experience in that matter.

We had to read and watch many tutorial videos on how to develop the basic actions and connecting to the different cloud apps we used for this project to run successfully.

At last, a general picture of the project:

