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T27, Team name: Team one

Team number: 53

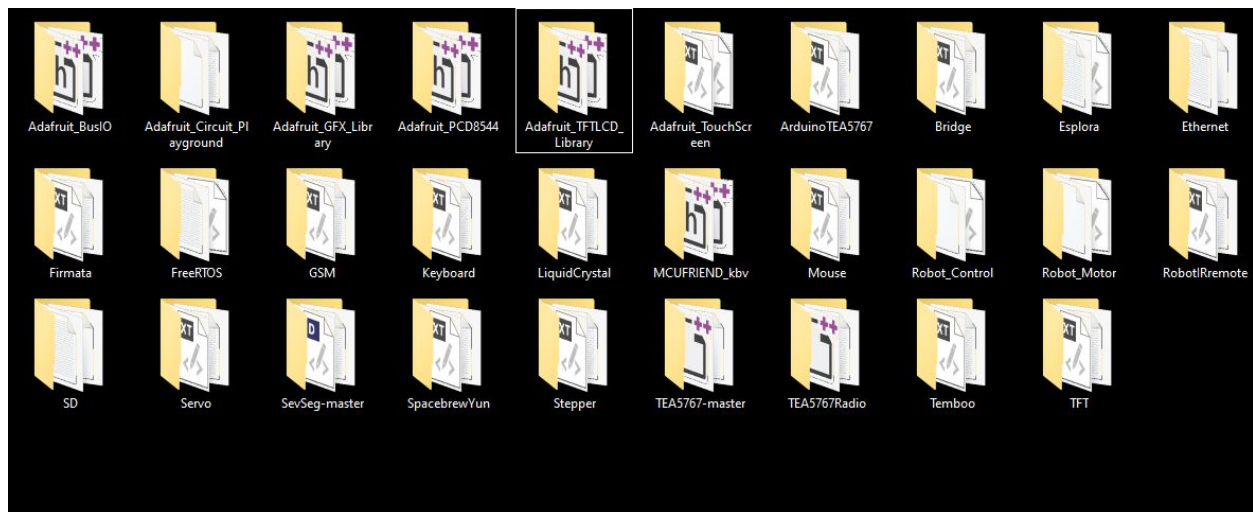
Overview

In this project we had three objectives, to achieve assistive parallel parking, automatic windshield wipers (and fuel detectors), and finally, a touchpad-accessible radio.

Specifications

Our components consisted of the following: 4 car motors, one plastic car, one breadboard, a lot of AA batteries, an arduino Uno, an arduino Mega, 2 H-Bridges, one TEA5767 radio, one TFT LCD 2.4", 4 IR proximity sensors, one rain sensor, one servomotor, one water sensor, and one seven-segment display. This, coupled with an abundance of jumper cables as well as 2 USB cables and some resistors, helped us achieve the previously mentioned objective.

These were not our only tools, as we had other libraries as well:




Inputs and Outputs

Most input pins were sensors, and these included the 4 IR sensors SENSOR1 through SENSOR4. Other sensors include capteur_D and capteur_A, which are the digital and analog pins for the rain sensor. Finally, some sensors and other pins are supposed to be treated as output as well, for example the sensorPin for the water sensor and the pins in the LCD screen.

Output pins were in the majority as output pins were often used to control the power going to certain components, such as the radioPower pin and the enable and IN pins in the H-bridges. Other outputs were XM and YM on the touch screen which signified where a person may have touched the screen. Finally, seven segment display sevSegPower was also a part of the outputs.

Scheduling



In the end we used FreeRTOS in order to schedule our tasks so they could run together smoothly, and by doing that we hoped that we can achieve maximum efficiency, going only a little beneath the little tick between each task. We divided all our workload into three tasks, one for motion, one for protection and one for entertainment. Giving priority to the driving part, we managed to form a well organized unit for a while until some of our components got burnt.

Our limitations became the lack of components as our components betrayed us and started burning out at a quick rate by the nearing 3 hours. At some point we had to rewrite the code because the laptop had been nearly fried and it stopped working for a long while.

Work division was quite simple as mentioned in the video, Mahmoud handled most hardware, Youssef held a bit more hardware than software, Ziad handled more software than hardware, and Morsy held an equal balance of both. I handled some of the LCD wiring and the freeRTOS, Youssef handled the radio and the LCD, Ziad handled the car motors and sensors, and Morsy handled the rain and fuel sensor.