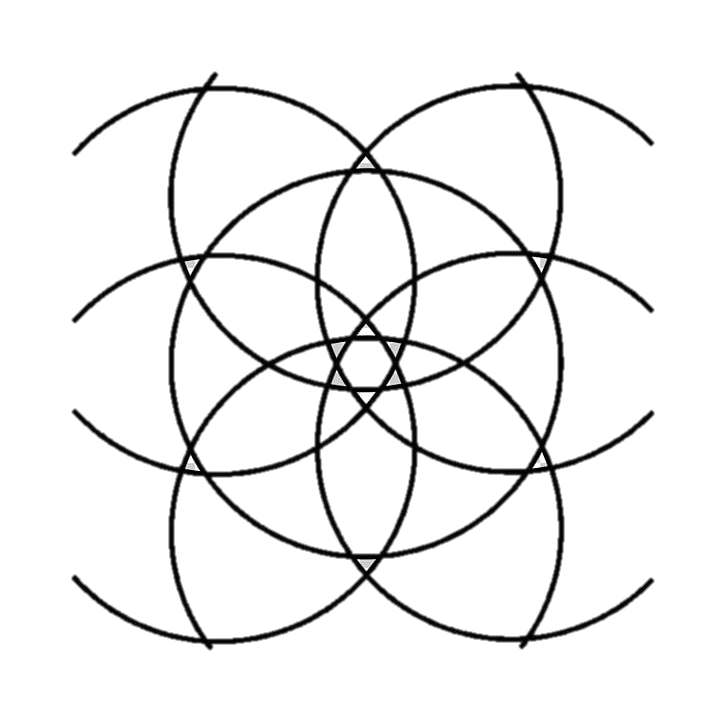


*ECTE 250*

**DELIVERABLE 3**

**Design Simulation Report**



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1. **SIMULATION RESULTS**

The car black box, also known as an event data recorder (EDR), is a device installed in modern vehicles to record and store several types of data related to the vehicle's performance and driver behavior. The hardware design of our car black box involves several components, including sensors, processors, and memory. Our car black box typically contains multiple sensors that measure various parameters related to the vehicle's operation. These sensors include accelerometers, which measure the vehicle's acceleration and deceleration, and gyroscopes, which measure the vehicle's orientation and rotational movements, GPS receivers, which provide location and speed data. Other sensors include Blink sensors and Alcohol sensors. The data collected by the sensors is typically stored in an SD card which is a non-volatile memory, which retains data even when the power is turned off. The amount of memory in a car black box can vary depending on the specific design, but it is typically designed to store several hours of data. Our car black box also includes a communication interface, GSM modem, to allow data to be transmitted to a remote server for analysis or retrieval. This can be useful in situations where the vehicle has been involved in an accident or has experienced a malfunction.

Overall, our hardware design of a car black box is intended to be rugged, dependable, and low-power, to ensure that it can operate reliably in a vehicle environment. It is also typically designed to be tamper-proof, to prevent unauthorized access or modification of the data stored on the device.

The system functionalities of a car black box can vary depending on the make and model of the vehicle. The primary function of our car black box is to record data related to a vehicle crash. A car black box can also record data related to the performance of the vehicle, including the engine speed, and other critical metrics. In addition to recording data related to vehicle performance, our car black box can also capture diagnostic trouble codes (DTCs) that may indicate issues with the vehicle's systems or components. This information can be helpful for mechanics and technicians to diagnose and repair problems with the vehicle. The car black box can also monitor driver behavior, including speed, braking, acceleration, etc. Overall, the system functionalities of a car black box provide valuable information about the operation and condition of a vehicle.

Diagram, schematic

Description automatically generated

Fig.1.1 – TinkerCad diagram

According to tinker cad, our gas sensor is not fully functional. We have tried to troubler shoot this fault with our lab instructor, but the issue still has not been resolved. However, we have not paid much attention to this because we would not be using a gas sensor in our design but an alcohol sensor, but it is not available on tinker cad.

Also, we have kept an IR sensor as our dummy blink sensor as eye blink sensor is also not on tinker cad. We have written a dummy code for our gyroscope/vibration sensor as the dummy sensor is not also available on tinker cad.

1. **ADDRESSING MENTORS’ FEEDBACKS**

The mentors had positive feedback on the functionalities, design and testing parts of deliverable 2. However, after feedback from one of the mentors about the design, we have changed our LCD display to OLED display for the prototyping part.

 Following this feedback, there is change in the budget. Our budget for parts only changed from AED 814 to AED 845 with the inclusion of the OLED. Our labor costs did not need change and remains the same as deliverable 2. In deliverable 3, by mentors’ instructions we have included the calculation of Return of Investment.

There was no change made in the plan part in this deliverable as positive feedback were given about our plan from mentors and was said no changes were made to the current plans - project plan, Gantt chart, WBS & risk assessment. In this part to a new section was added by the mentors’ instructions - milestones. We explained in milestones we have seven milestones which are the seven deliverables and the final eighth milestone which is the Innovation Fair.