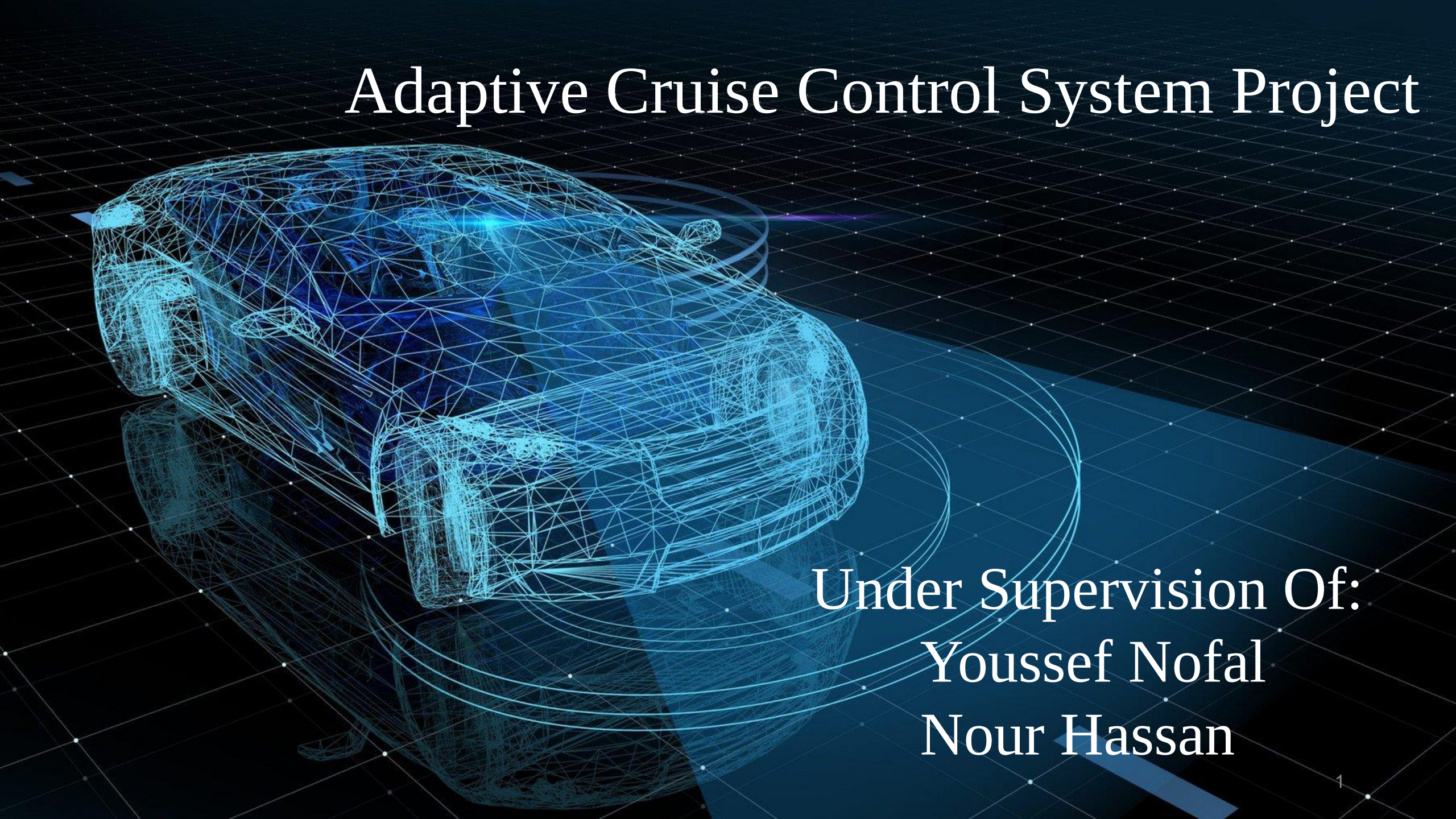
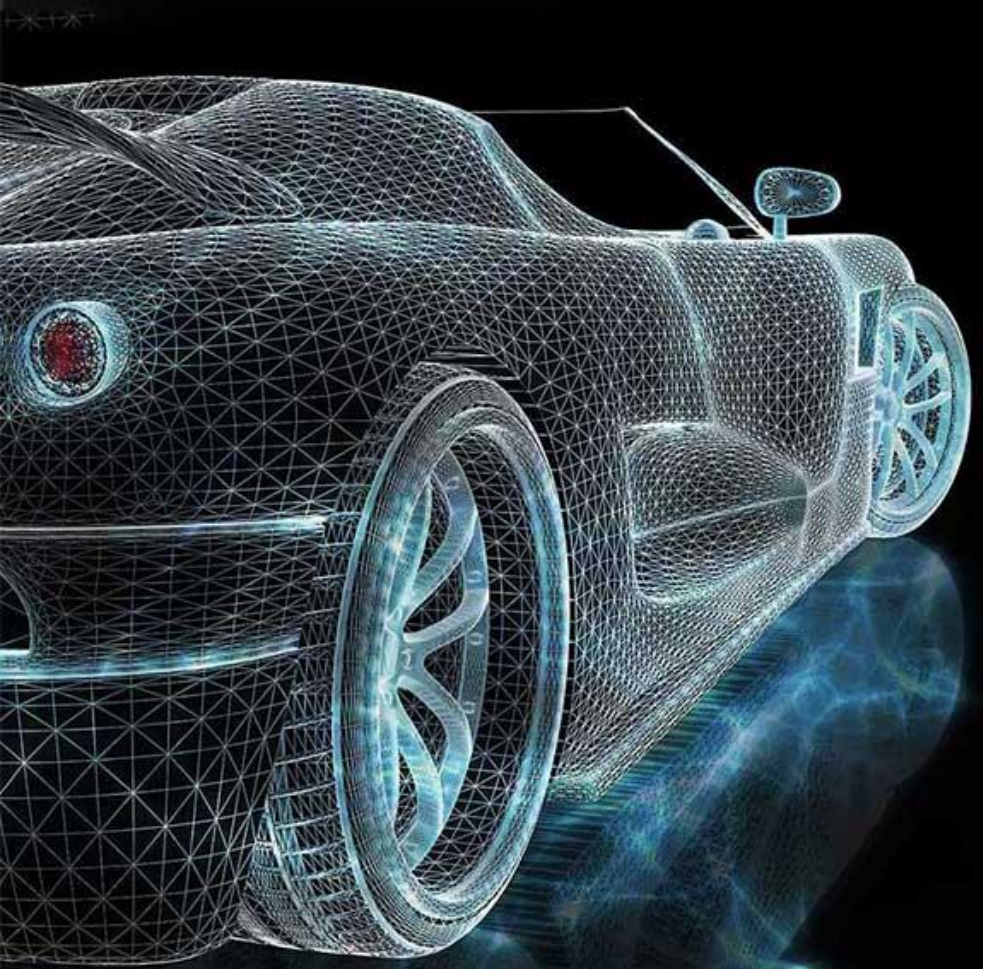
Adaptive Cruise Control System Project



Under Supervision Of:
Youssef Nofal
Nour Hassan

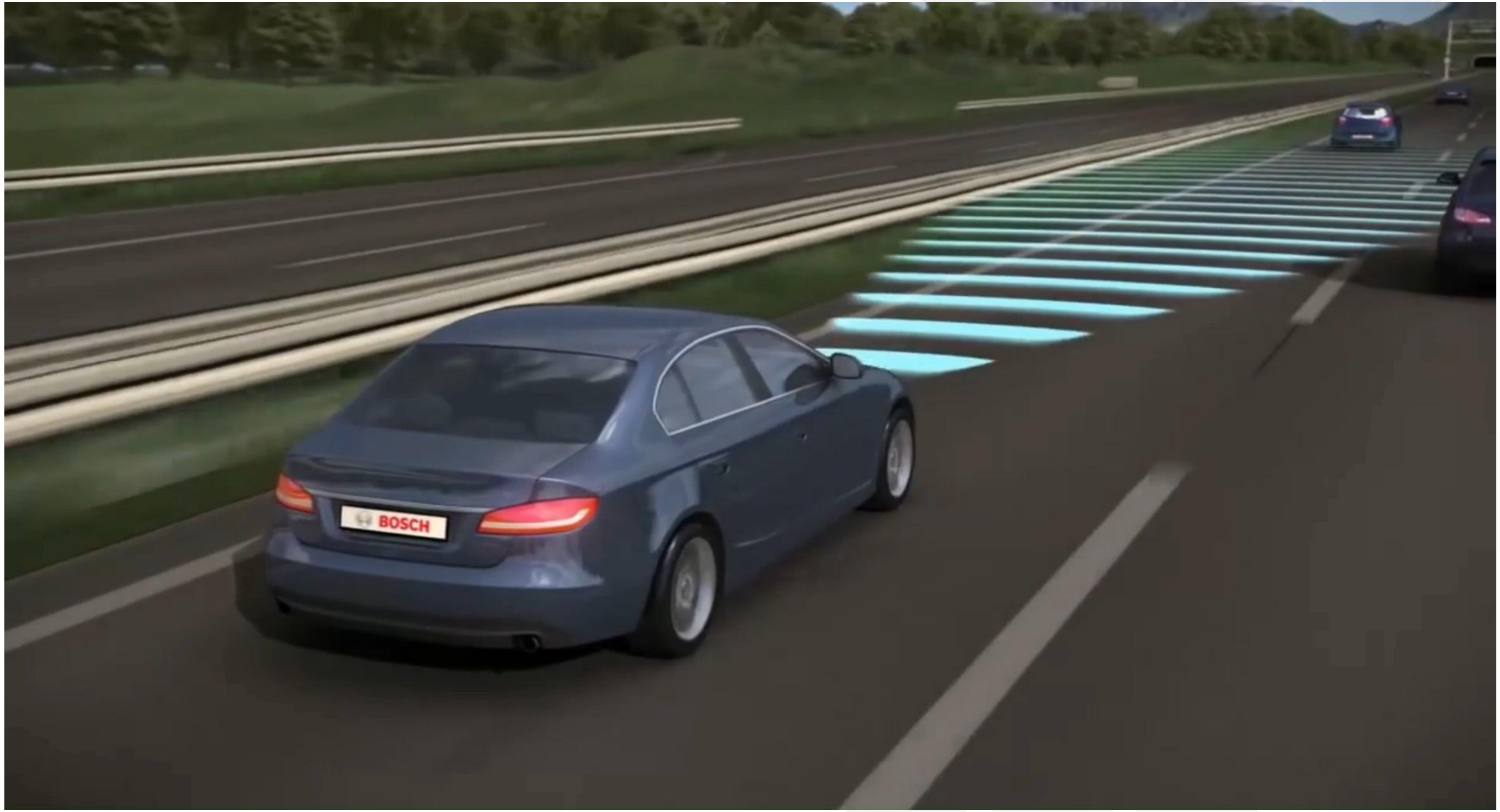
Contents



- Introduction
- Used Components
- System Communication
- Infotainment System
- Cruise Control System

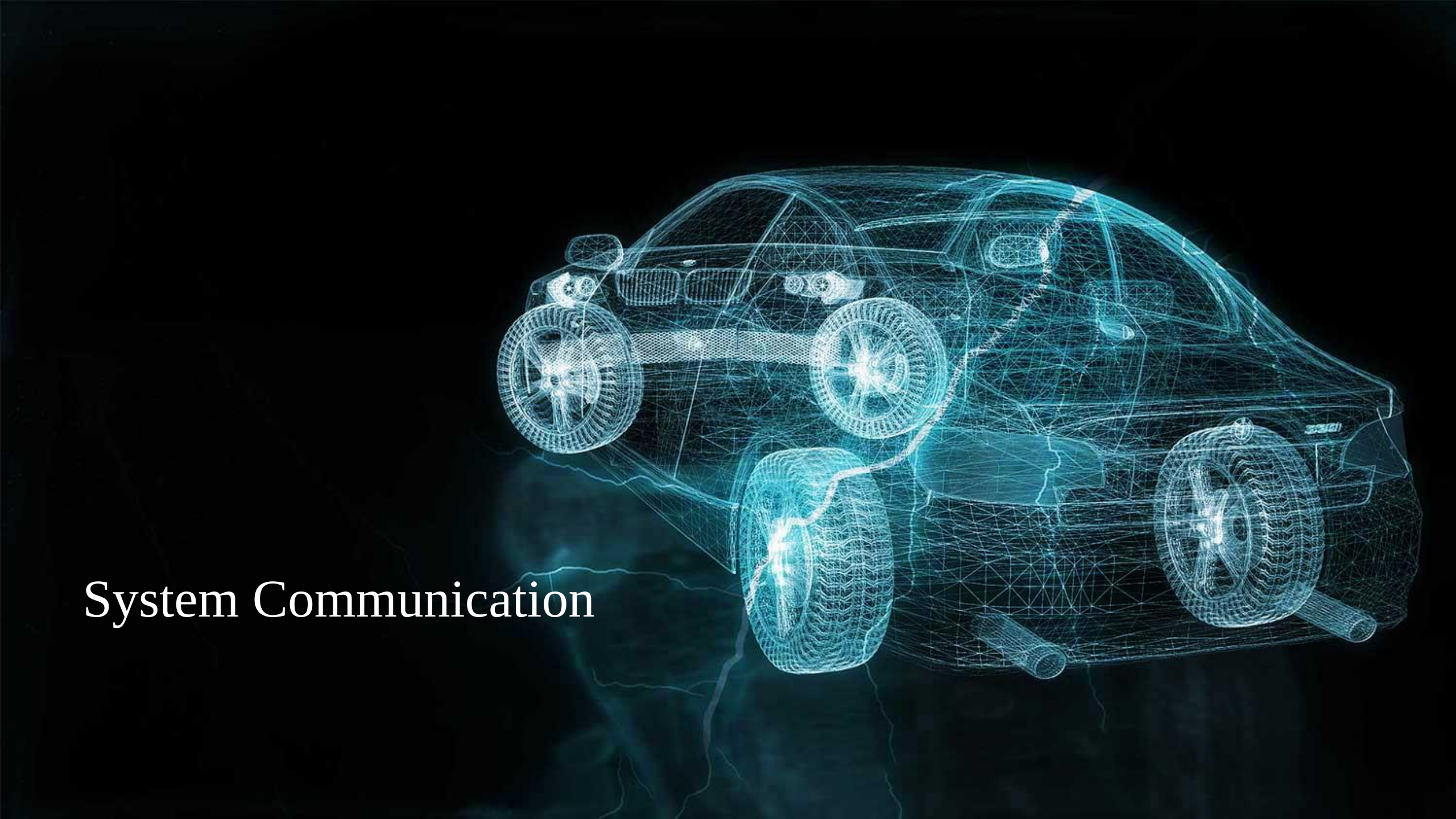
Introduction

- What is the project?
- The idea of our project.
- Why did we choose it?
- Our business plan.

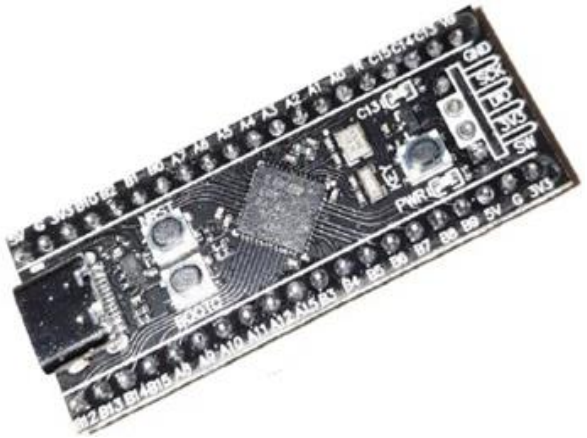

BOSCH

Task	Assigned To	Progress	Start	Days	End
Phase 1 (SW System Requirements)		100%			
Phase 2 (SW Design)	Ashraf & Abdelrahman	100%	1/2/23	2	2/2/23
1-Module Determination		100%			
1-1- what are the functions of each module?		100%			
1-2- what is the purpose of each function ?		100%			
1-3- what are the input parameters& outputs of each function ?		100%			
2- Layers of the system & what are the the periphrals of each layer ?		100%			
6- communicaton protocols used..		100%			
Phase 3 (Coding)		100%	1/2/23		2/3/23
1- Interface Raspberrypi with QT	Esraa	100%	1/2/23	7	7/2/23
2- interface STM32 with UART	Alaa	100%	1/2/23	7	7/2/23
3- interface STM32 with Ultrasonic sensor	Ashraf	100%	3/2/23	9	11/2/23
3-1- Implement ICU for Ultrasonic Sensor		100%			
3-2- Test Ultrasonic distance measurement		100%			
4- DC	Abdelrahman	100%	2/2/23	9	10/2/23
4-1 Build Timers Driver (for PWM Mode)		100%			
4-2 Control DC Motor Speed		100%			
5- Interface UART with Raspberrypi	Alaa	100%	5/2/23	5	9/2/23
3-1- Build & Test UART driver		100%			
6- Lighting System	Alaa & Abdelrahman	100%	23/2/23	8	2/3/23
LEDs & Buzzer if Danger.					
7- Integrate STM32 with RaspberryPi QT using UART	Esraa & Alaa	100%	7/2/23	7	13/2/23
4-1- Send data by STM32 to RPi & display it on HMI (communication protocols study)		100%			
4-2- Receive data sent by RPi to STM32 to configure ACC mode.		100%			
Phase 4 (Integration & Testing)	Everyone	100%	13/2/23	11	23/2/23
1- System Integration		100%	13/2/23	11	23/2/23
1-1- Stm32 SW & HW Integration		100%			
1-2- Rasp SW & HW integration		100%			
2- System overall testing		100%	25/2/23	7	3/3/23
Phase 5 (presentation Preperation)	Everyone	100%	2/3/23	1	2/3/23
Phase 6 (Documentation Preparation)	Everyone	100%	22/2/23	3	24/2/23

System Communication



Used Components



STm32f401CC

Raspberry Pi 3

Uhtrasonic

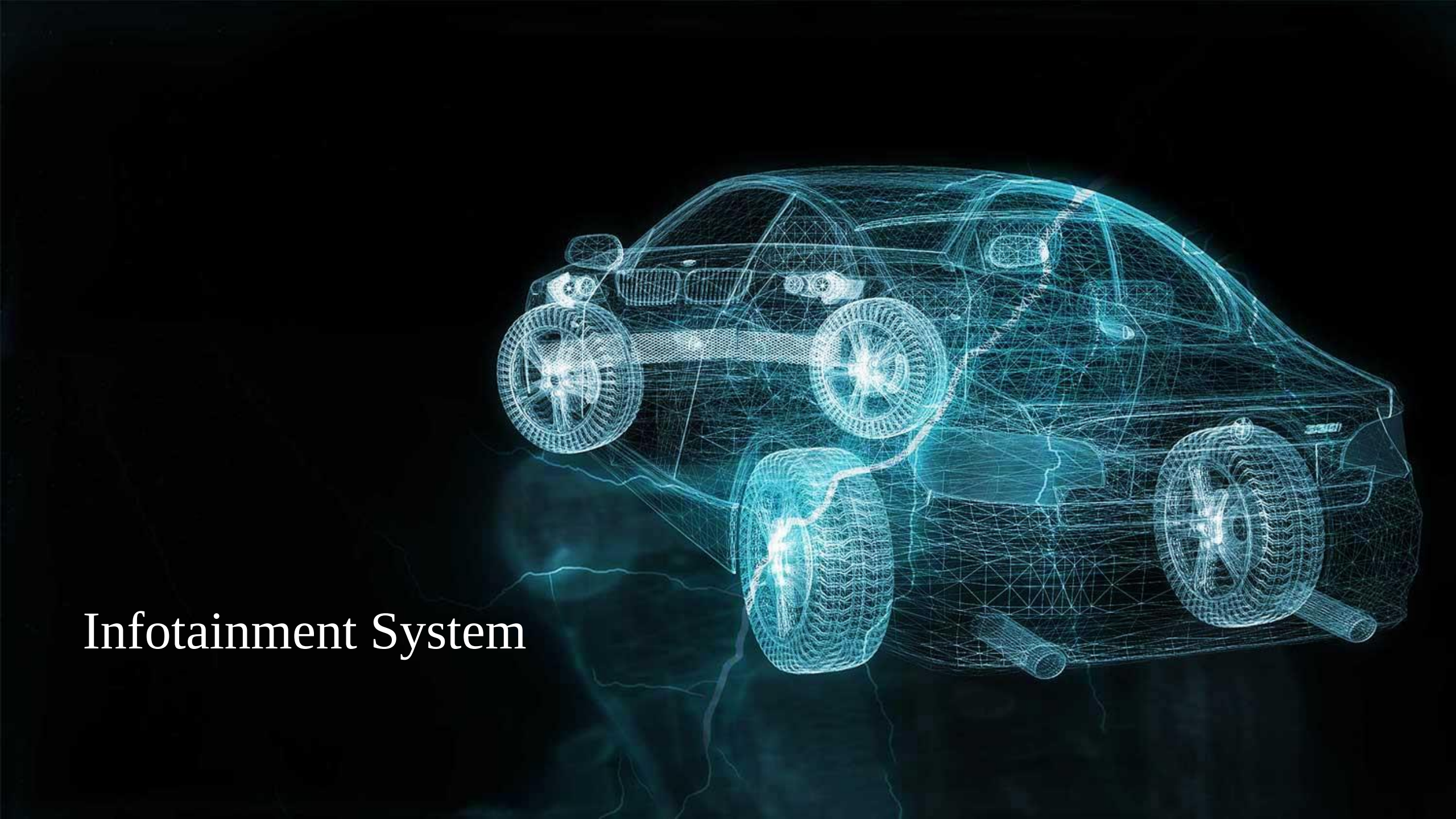
Buzzer

LED Matrix 8x8

LCD screen 7inch

System Communication

Using UART communication protocol to communicate between Raspberry pi and stm32 as user can control on car movement and car speed and object distance data can be shown on GUI.


Infotainment System

Infotainment System

The Graphical User Interface (GUI):

- Displays System Data like Current Speed Current and Distance.
- Controls all System Features.

Infotainment System

- Voice Command

Using Google Home App, the user can control some features of the product features like NCC and CC off.

Cruise Control System

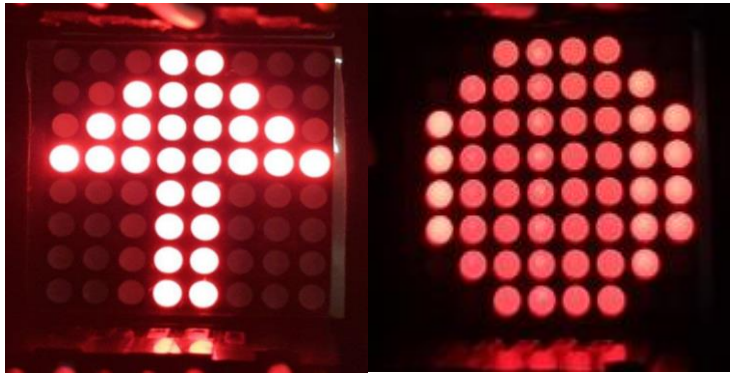
Cruise Control System

Normal Driving Mode

- Accelerate
- Deaccelerate
- Stop

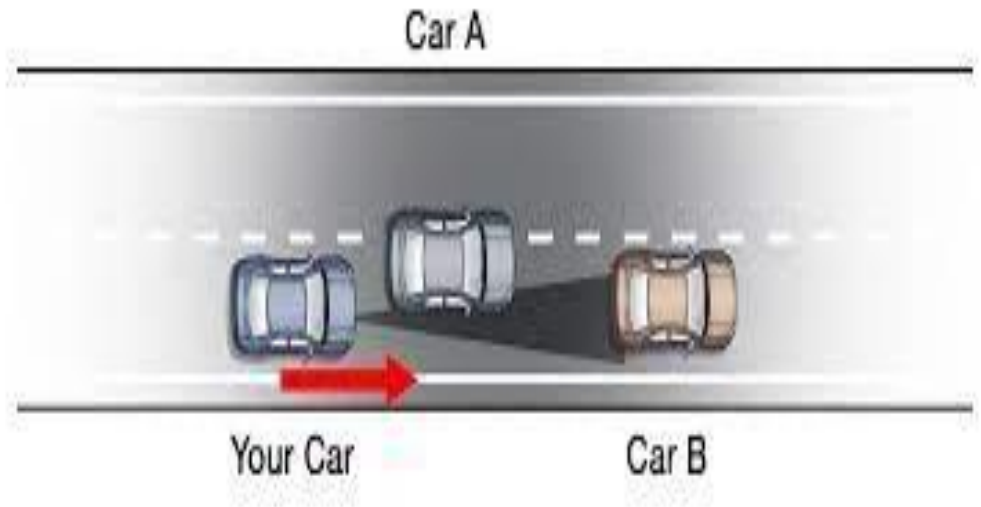
Led Matrix

- Accelerate sign
- Deaccelerate sign
- Stop sign



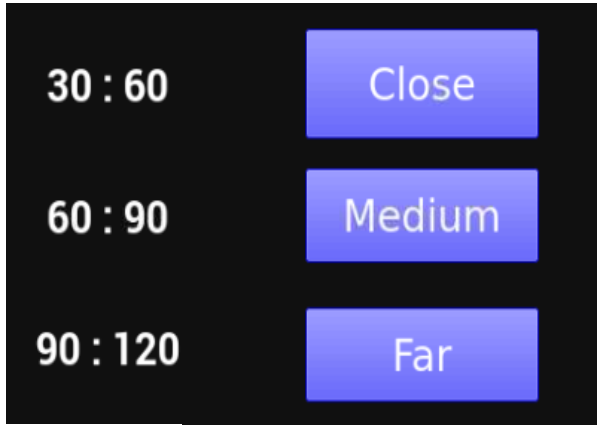
Normal Cruise Control

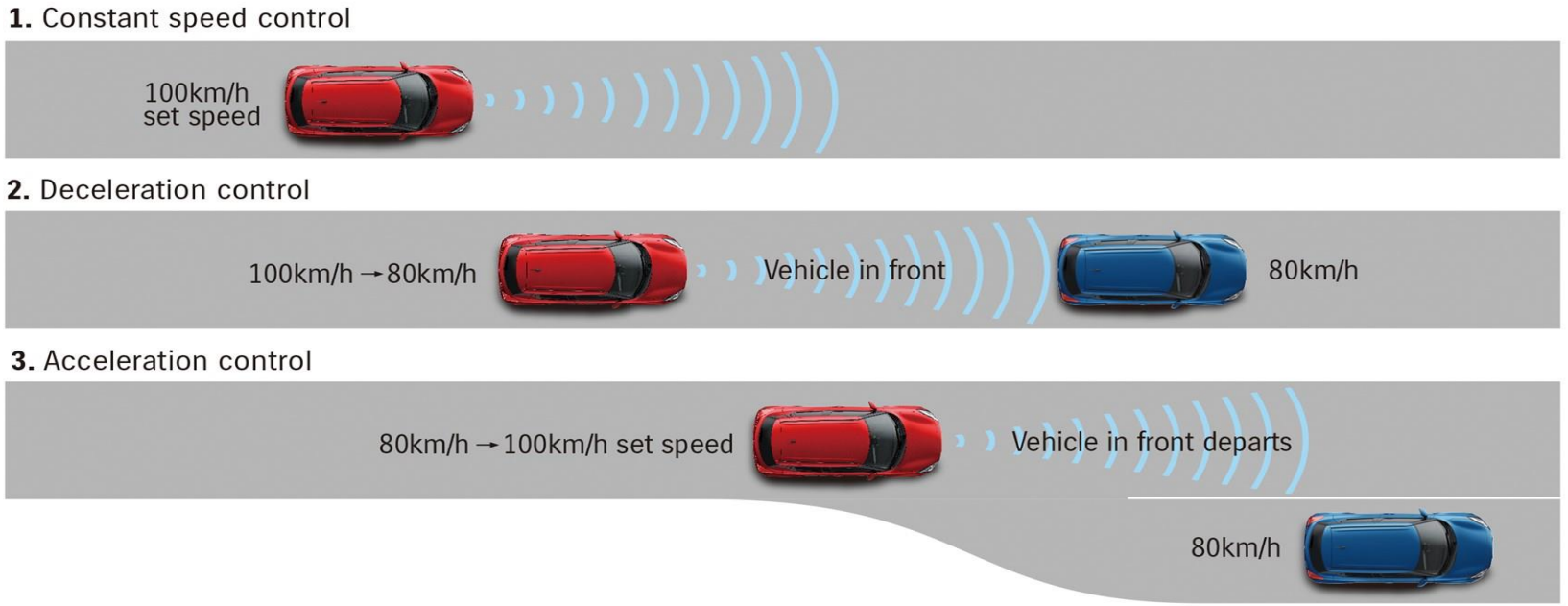
- Alerting the driver of close objects ahead
- Stop the car at danger distance



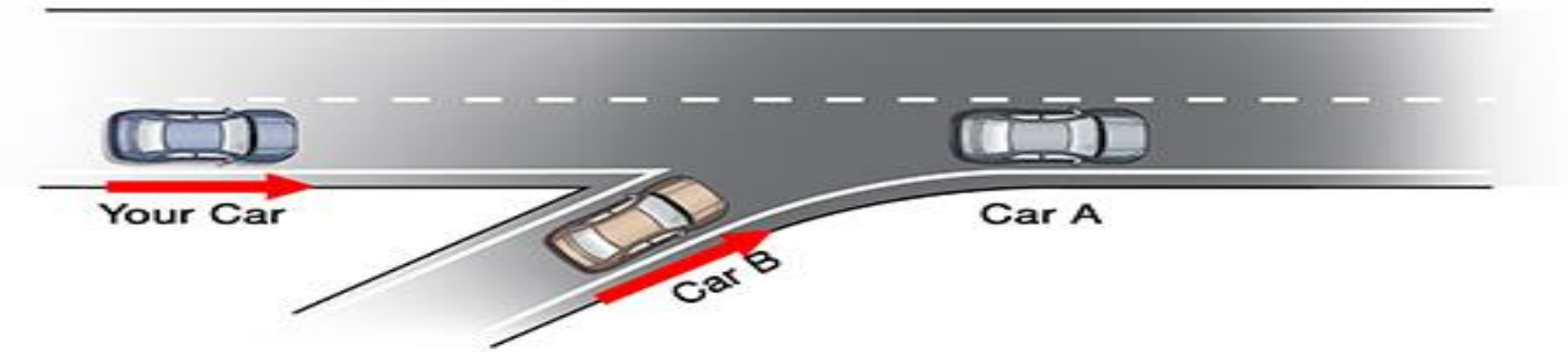
Adaptive Cruise Control

- Selecting Range.
- Increase & decrease speed based on the measured distance.





- Stop the car at danger distance.



Problems We Faced

- The response of motor with encoder.
- LCD screen’s touch feature.

Questions ?


Thank You