Department of Computer and Information Systems Engineering
CS-406 Computer Engineering Project
Proposal for the Final Year Design Project

Title	**DeepCars (Simulation of self-driving car using Deep Neural Network)**

Domain	Domain 1 **Research**	Domain 2 **Physics**	Domain 3 **Simulation**	Domain 4 **Neural Networks**	Domain 5 **Testing**	Domain 6 **Documentation**

1. **Nature of Project [Tick all that applicable]**

☑ New Project OR ☐ Extension of Existing Project	☐ Industrial Collaboration	☐ Funded
☐ Other Department Collaboration (If yes) Department Name_____	☐ Other Academic Institution Collaboration (If yes) Institution Name_____	

2. **Brief Outline (*Problem Identification and Significance*)**

When humans realize the need of transport they started using animal carts because animals know what will be the right or optimal action to take in the environment but the industrial revolution has changed the whole concept. Now instead of using animal carts vehicles are used for the same purpose because it is time constrained and animal carts are considered odd, even among 3rd world nations. This creates a problem for the people who are handicapped and who do not know how to drive.

3. **Objectives**

In an article, we have studied that the pioneer of electric and self-driving cars, **Tesla motors,** requires human interaction for switching between lanes of the road when the car next to it is slow. So in this project we will work on:

1. Designing of an environment.
2. Designing of an Agent.
3. Finding the reaction of the agent's action.
4. Designing of Deep Neural Network that will maximize agent's utility
5. Testing of agent-environment collaboration to check for optimal results.

4. Scope

As we know that humans are non-deterministic in nature. So if we hire a person as driver it may be possible that one day he gets sick or he may have any emergency. In both scenarios we have to compromise on our commitments or schedule so why not 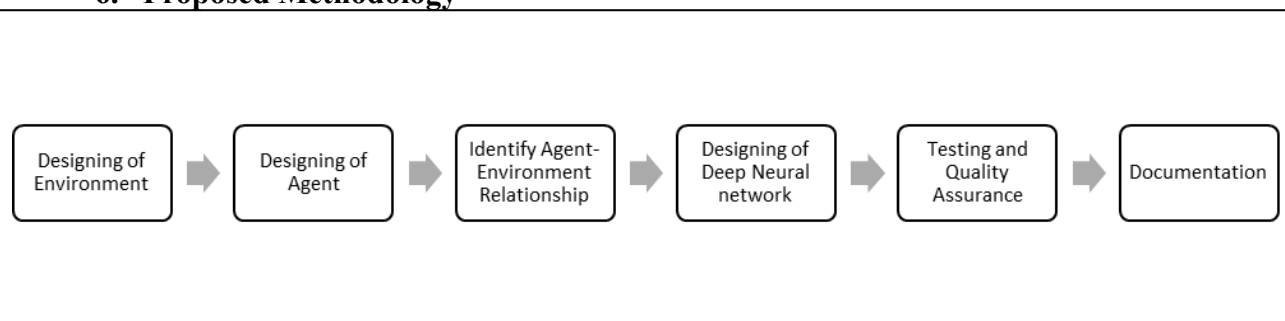design a car which never lets us down. Technology is progressing at a very fast pace and the things that seemed to be impossible 10 years ago are now possible and human needs are also changing day by day.

15 years ago when someone gave the idea of driverless cars everybody thought that it was a waste of time and money but nowadays, almost every automobile organization is researching self-driving cars but no one is able to make a perfect model and our course work has told us to simulate everything before going towards deploying because it is a cost efficient way.

5. Unique Selling Points (USP's)

1. The chances of road accidents will become low because self-driving cars use their specified speed lanes.
2. If the owner of the car interrupts to drive fast traffic police will have an idea of that if the government embed its own program into it to keep an eye because robot don't tell a lie.
3. The government will be able to have the proper data of road incidents in order to make new policies and transport projects if such type of transport came into the market.

6. Proposed Methodology

Designing of Environment → Designing of Agent → Identify Agent-Environment Relationship → Designing of Deep Neural network → Testing and Quality Assurance → Documentation

7. Resources Involved

Equipment resources:

Software Specifications:
- For Front-end Development:
  - Visual representation of environment, agent etc will be implemented using Python or Javascript.
- For Back-end Development:
  - **TensorFlow-Keras:**
    - For designing and training neural networks.
  - **Python:**
    - For saving model memory and state.

8. SDGs (If Applicable)

☐ No Poverty	☐ Zero Hunger
☐ Good Health and Well-Being	☐ Quality Education
☐ Gender Equality	☐ Clean water and Sanitation
☐ Affordable and Clean Energy	☑ Decent Work and Economic growth
☑ Industry, Innovations and Infrastructure	☐ Reduced Inequalities
☐ Sustainable Cities and Communities	☐ Responsible Consumption and Production
☐ Climate action	☐ Life Below Water
☐ Life on Land	☑ Peace, Justice and Strong Institutions
☐ Partnerships	

9. Gantt Chart

Month	Year 2022 to 2023
November	Start Research
December	Environment Development
January	Environment attributes Development
February	Agent Development
March	Neural Network Training
April	Neural Network Optimization
May	Testing and Quality Assurance Engineering
June	Research Paper writing
July	Documentation

10. Details of Project Team

i. Students

No.	Name	Seat No.	Signature (s)
1	Muhammad Hammad	CS-19149	
2	Muhammad Jan	CS-19302	
3	Musfirah Fayyaz	CS-19303	
4	Faseeh U Rehman	CS-19304	

ii. Supervisors / Advisors

	Name	Designation & Department	Address & Contact	Signature(s)
Supervisor	Prof. Dr. Syed Abbas Ali	Professor Computer Systems Engineering	CISD NEDUET +92 3003991788	

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Project Serial No.: _____ Dated: _____	Signature Convener Steering Committee	Signature FYP Coordinator

☐ Proposal Approved	☐ Not Approved	☐ Returned for Clarification / Modification
Comments: (if any)		

_____
(Signature of Chairperson)

Date: _____