Final Year Project Proposal

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Suggested Supervisor:
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Project Details

Project Title	Driving Matter 2.0: Autonomous Markerless AR-based Car Simulation using Deep Reinforcement Learning.		
Project Area of Specialization	Augmented Reality and Deep Reinforcement Learning.		
Project Start Date	2020-09-01	**Project End Date**	2021-05-15
Project Summary	The project includes an Augmented Reality based interactive car as an AI agent. The agent i.e the vehicle in an augmented driving matter environment will use a feasible shortest path algorithm to traverse through random rewards in form of diamonds placed randomly and reach the goal state. The agent will be placed by tapping from the user on the android device's screen. It will pop up and will fall from a height on ground using the physical properties of the environment. It will also detect obstacles in its environment and avoid collision with real world and virtual obstacles in the application.		
Project Objectives (less than 2500 characters)	**FYP I Objectives:** 1) A virtual AI agent that will go through diamonds as rewards, randomly pop up in the environment and traverse through rewards to reach the goal state that will be a flag, using a feasible shortest path algorithm. 2) The Agent will recognise real life objects as obstacles and intelligently avoid them to reach the goal state. 3) It will also detect virtual 3D objects and AI Agent will intelligently avoid them. **FYP II Objectives:** 4) Implementing deep Reinforcement Learning in AI agent and the environment. 5) Developing the final application.		

Project Implementation Method	**Augmented Reality**: Unity 3d, AR-Foundation, AR-Core **Object/Collision Detection:** Open CV **Rest API** Python, Flask, Azure
Benefits of the Project	1) Modeling and Simulation 2) Collision Detection 3) Autonomous Vehicle Simulation
Technical Details of Final Deliverable	A virtual AI agent that is an augmented reality based Car will go through diamonds as rewards, randomly pop up in the environment and traverse through rewards to reach the goal state that will be a flag, using a feasible shortest path algorithm. The Agent will recognise real life objects as obstacles and intelligently avoid them to reach the goal state. The AI Learning Agent will detect virtual 3D objects and will intelligently avoid them. It will implement deep Reinforcement Learning in AI agent and the environment in thel application.
Final Deliverable of the Project	An AR based Car Simulating Application on Android platform using markerless augmented reality. In FYP II we aim to implement Deep Reinforcement Learning Algorithms on the car and its environment.
Type of Industry	Data Science, Android Development, Game Development, Web Development
Technologies	Unity3d Rest API in Flask Python Deep Reinforcement Learning
Sustainable Development Goals	Developing an AI Learning Agent that will avoid the real world objects as obstacles and go through all the diamonds, popped up randomly(as rewards) and reach to a final flag (goal state).

Project Key Milestones

Elapsed time in (days or weeks or month or quarter) since start of the project	Milestone	Deliverable
Project 1	1st 15 Weeks	Car Simulation in 3D environment.
Project 2	2nd 15 Weeks	Deep RL applied on the AI Car Agent and its environment.

Project Equipment Details

Item Name	Type	No. of Units	Per Unit Cost (in Rs)	Total (in Rs)
None	-	0	**0**	0
			Total in (Rs)	**0**