Final Year Project Proposal

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Suggested Supervisor:
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Project Details

Project Title	Controlling 3D gaming agents in an adversarial setting with deep reinforcement learning
Project Area of Specialization	Deep Reinforcement Learning
Project Start Date	2020-08-15
Project End Date	2021-05-31
Project Summary (less than 2500 characters)	In order to perform a large variety of tasks and to achieve human-level performance in complex real-world environments, Artificial Intelligence (AI) Agents must be able to learn from their past experiences and gain both knowledge and an accurate representation of their environment. Traditionally, AI agents have suffered from difficulties in obtaining a good representation of their environment and then mapping this representation to an efficient control policy. Deep reinforcement learning algorithms have provided a solution to this issue. This project aims to train 3D gaming agents using different deep reinforcement learning models.
Project Objectives (less than 2500 characters)	1. To train a 3D adversarial gaming Agents to take actions on its own. 2. Agents can challenge the professional human game Tekken players and even the world top Tekken player champion human level intelligence in beating all 3 games of Tekken. 3. To use different reinforcement learning techniques e.g. Q-learning, Deep Q-learning, DDQN etc 4. Making a restricted environment for different games to train different agents.

Project Implementation Method (less than 2500 characters)	1. Running Different Algorithm with slimevolleygym. 2. Making Cartpole Gaming Agent with different Models 3. Implementing Models for Airstriker Genesis. 4. Creating an Environment for Tekken i.e. reward function, loss function etc. 5. Running different models to train an agent with the environment.
Benefits of the Project (less than 2500 characters)	1. Model training 2. Controlling 3D agent environment 3. These models will help in understanding the real-world problem in a better way. 4. Explore and Exploit balancing.
Technical Details of Final Deliverable (less than 2500 characters)	To create a constraint environment to train a reinforcement learning agent on limited features and we are taking different adversarial 3D games as an example to train our reinforcement learning agent on these restricted environments using different deep reinforcement learning models. Our agent will challenge the world class player and try to beat the player.
Final Deliverable of the Project	1. Graphs 2. Learning Model 3. Real world 3D Environment 4. 3D Adversarial Gaming Agent
Type of Industry	Artificial Intelligence, Robotics
Technologies	Python, OpenCV. Tensorflow, GitHub, Qt, Keras, PyTorch, Retro, Gym
Sustainable Development Goals	Deploying 3D gaming agents that learn from the environment. In this project, the use case we are considering is Tekken. Our agent takes actions like punch, kicks with its own to maximize his reward. At the end, the agent will be able to win the game.

Project Key Milestones

Elapsed time in (days or weeks or month or quarter) since start of the project	Milestone	Deliverable
FYP-1	1st 4 Month	Train Models on AirStriker Genesis
FYP-2	2nd 4 Months	Environment Creation for Tekken and Train agents.

Project Equipment Details

Item Name	Type	No. of Units	Per Unit Cost (in Dollars)	Total (in Dollars)
Azure Credits	VMware	2	500	1000
Total				**1000**