**Final Year Project Proposal**

**Title:** NBA coaching aid using video processing and machine learning

**Supervisor:** Jamie Ward

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**Project Description**

The aim of my project is to provide coaches an additional aid in making decisions in the most crucial moments in basketball in the form of an application. Currently, it is entirely up to the knowledge and analysis of the players, coaches and assistant coaches that make up the choices in basketball which are constantly influenced by several factors such as time, emotion and experience. Through the use of real-time video processing and machine learning, we can alleviate some of the pressure of a coach in a serious game.

**Methodology**

There are several components to this project which will naturally create many milestones. An outline has been listen below:

* Collect previous and real-time stats on NBA players. This is to help analyse the expected performance of a player as well as their current performance.
* Collect video data on previous games and combine it with those states to be fed into a machine learning model.
* Create an unsupervised machine learning model, to help identify what is going on – When a player is shooting/dribbling/setting a screen
* Create a supervised model to identify what is best option advised offensively
* Compare outcome with popular coaching choices via questionnaire and demonstration

**Expected outcomes**

By sticking to this methodology, I expect to be able to have a coach have a game recorded live and have a tactic given which can be implemented before a game or during a time out. I expect the system to accurately mirror what most coaches would suggest; similar to when chess analysis tool tells you the best possible move. I believe that it has a lot of scope potential also as it can be expanded to be a fully fledge coaching assistant, judging player performance on defence as well as offense. It has potential to suggest even substitutions.

**Literature review**

Below are some of the sources I’ve viewed on regarding this project. I aim to use them to get a broader insight on what is required for my project.

**1.** Miller B. Using Automated Machine Learning to Predict NBA Player Performance [Internet]. Blog.datarobot.com. 2018 [cited 11 December 2018]. Available from: https://blog.datarobot.com/using-datarobot-to-predict-nba-player-performance

**2.** Bunker R, Thabtah F. A machine learning framework for sport result prediction. Applied Computing and Informatics [Internet]. 2017 [cited 11 December 2018];. Available from: https://doi.org/10.1016/j.aci.2017.09.005