**Prediction of basketball game outcome using Deep Neural networks**

**Deep Learning and Motivation:**

Deep Learning is one of the advance machine learning technique that has shown promising results specially in the domain of classification models, Deep neural network proved to be a better model as compare to other machine learning techniques. My interest in basketball and my academic knowledge of machine learning motivated me to build a Neural network model to predict basketball game outcome. Sports outcome prediction is always a topic of interest for large community of sports fans. Not only the fans but team coaches, managers, players, bookmakers and even betting websites want to predict the game results beforehand. Talking about the current situation, most of the accurate predictions are made by game experts and machine learning models are slightly less accurate than these experts. For instance Sports line website takes help of multiple game experts for their website and they have an highest accuracy of 68-70 percent, while there are multiple research papers for various sports prediction which have an accuracy of 60-65 precent approximately.

**Aim and Success Measure:**

Main Aim of this model is to get the most accurate model for basketball prediction using Machine learning and I believe I can achieve that using deep neural networks. As a baseline or we can call it a success measure is to achieve an accuracy of more than 65% which is slightly better than current machine learning models, next step is to overcome accuracy mark of 70% to beat game experts. The better we can design the model the better it can be, there is no upper bound on accuracy.

**Model development:**

Working on this model, I figure out that the data we usually capture in sports are the post game data like total points scored, which player got most points etc but the issue with this data collection technique is we cannot give this data as input to our model and then ask model to find output of a future game because these input attributes are also not available before a game. After getting a useful input from my Professor Ivan, I developed a model which can use an average performance data for both the team playing the game and then trying to figure out how the outcome of the present game can be based on this previous data.

**Dataset:**

For this project I am using a dataset provided in Kaggle which have multiple post game statistics and trying to train my model based on 2012-2018 data and splitting the data to get a test set of around 500 games to find out the model accuracy. Currently the model accuracy is around 58% and I am still working on it to improve the score.

**Plan and Future Work:**

By end of July I think I can at least increase my accuracy in the range of 60-65 or maybe even higher. I can give a demo presentation or show the working of my code in July. I am in a beginner phase of machine learning model building and also working alone on this. I am looking for more experienced people to join me or at least guide me in the right direction. I have more ideas but its complicated and I am not sure how to add those in the model so if I have more time I will try to research more on this and improve my model as much as possible. One of the main reason for me to joining this competition is to see how large scale models are made, what to think before building a model, how planning is done. What are the pipeline and how to create and add new ideas in a project. Maybe I can get few people to join me on my project work or maybe help me to achieve better model performance. I am looking forward to learn much from this competition, thank you.

**Team Members**

**1.** Animesh, Graduate Student in Engineering Science from Simon Fraser University. Enrolled in Spring 2021 and currently in my first year of study.