**Predicting career path of NBA players**

Much research has been conducted to predict the career path of Major League Baseball (MLB) players. These researches focus on the usage of labeled data, such as salaries and physical attributes of a player. Linear regression models were applied on this data in order to predict the career path, i.e success, of a player. This led to models that were reasonably able to predict the trajectory of a MLB player. The latter has barely scratched the surface with this analysis and with the growing availability of data an increase in interests has occurred leading to the National Basketball Association (NBA) to published much of their available data.

Recent research has attempted to achieve similar results for the career path of NBA players. These research works focus on the use of labeled data such as number of seasons played [1], achieving poor result using nearest neighbor classifications. Other research has attempted to use salaries as a label, which led to numerous difficulties. Not only did earlier research show that the salaries [2] are not a good indicator of success [3], the salaries appeared to be less uniform and available than expected. Due to the absence of salaries for many players in the dataset used by Shah et. al [3] the model achieved poor performance. In their future work Shah et. al proposed to solve the scarcity of the salary data before applying the models. Research conducted by Moxley et al. (2014) [4] defines career success as a consequence from past performance.

This thesis proposes to apply neural network architectures such as LTSM and machine learning (ML) algorithms such as SVM and decision trees to attack the problem of accurately predicting the career path of NBA players. This thesis will not only focus on the use of salaries as an indicator of success but other features will be considered. These features are residence, draft year [5][6][7], seasons played[3] and, as was the case with the MLB, physical properties that might influence performance and the career path[5]. Neural networks have been used prior on basketball data to predict outcome of NBA games [8]. However, most research on basketball is conducted using statistical methodologies and less is done with ML algorithms [9]. This research aims to demonstrate the strength of applying neural network architectures to basketball data by predicting and classifying the career path of a given NBA player.

In order to evaluate the outcome, the result of the classifications is compared with previous work where only statistical methods were used. The data consist of basketball data, collected from several sources such as Euroleague, Nbaminer and the NBA in 1985 onwards. Using several sources, the aim is to combat the scarcity problem mentioned beforehand. The availability of the data of several players throughout the year allows for sequential patterns which can be exploited to improve the accuracy of the classifiers. By separating the data into different timeframeshave as little overlap as possible.

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Euroleague players and NBA players are usually with little overlap in career paths. Therefore, the models can be compared to evaluate the difference between career paths of NBA and Euroleague players and the transferability of the models within these different domains.

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