A Machine Learning Approach For E-sports Analysis

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Abstract

In recent years, e-sport has gained its popularity, but the study of it has been lagged behind. Therefore, in this project, we look deep into the nature of e-sport and create models that can best predict its outcome. We look at the well studied models targeting the traditional sports and evaluate our approach against the existing models.

1 Introduction

In the last couple of years, e-sport saw a significant growth, both in terms of players and spectators [3]. Unlike traditional sports, online matches are formed quickly. Players can find and play against opponents within minutes. As a result, e-sport competitive play occurs very frequently. This fluidity also causes e-sports structure to differ significantly from traditional sports. To allow for fast paced match making in games like League of Legends, both teammates and opponents are chosen randomly from a large pool of players of similar ranking. Players on the same team most likely do not have prior collaboration history, while players facing against each other most likely have not studied each others strategies. Because of this added complexity, many well-studied models that predict traditional sports outcomes might no longer apply to e-sports. Therefore, in this study, we intend to develop a classifier adapted for e-sports structure, and in particular, for League of Legends competitive gaming model.

2 Related work

Given the similarities between e-sports and traditional sports, we believe that it is beneficial to look at some well studied models targeting traditional sports and use them as our baseline. There are many related works of this field [1][2], and each of them provide unique angles to the problem. One particularly interesting model aimed to predict the outcome of football matches proposed by A. Joseph et al. is constructed based on Bayesian networks [1]. In this model, a Bayesian network is constructed based on the presence of key players, their positions, home-field benefit and an estimation of the quality of the opposing team. As far as we are concerned, this model has several important points. First of all, due to the nature of football game organizations, there is not much data to consider. That said, a particular football player only has a limited career time and there are only limited amount of football games in a season. As a result, for each player, their performance data are very limited. The insufficiency of data suggests that it is inappropriate to build models based on each player's performance in the games. To solve this problem, the proposed model only consider the presence of some key players as well as whether their initial playing positions. The observation is that a player, with his professional skills, will contribute to the team in the game - as long as he plays in that game.

Table 1: Sample table title

PART	DESCRIPTION
Dendrite	Input terminal
Axon	Output terminal
Soma	Cell body (contains cell nucleus)

3 Methods

vvv

4 Experiments

A table:

5 Conclusion

vvv

6 References

References

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[2] B. Min, J. Kim, C. Choe, H. Eom, and R. B. McKay. A compound framework for sports results prediction: A football case study. *Knowledge-Based Systems*, 21(7):551 – 562, 2008.

[3] E. Witkowski, B. Hutchins, and M. Carter. E-sports on the rise?: Critical considerations on the growth and erosion of organized digital gaming competitions. In *Proceedings of The 9th Australasian Conference on Interactive Entertainment: Matters of Life and Death*, IE '13, pages 43:1–43:2, New York, NY, USA, 2013. ACM.