Bellarmine University

Predictive Analytics of Professional eSports Game Outcomes

Professional Valorant eSports

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Executive Summary:

Fantasy sports have been active in cultures around the world for many years now. People from all across the globe take part in fantasy football, baseball, soccer, and many more sports. Although recently a new sport has been on the rise and that is eSports. Online video games have gotten so competitive that professional scenes for individual games have become multimillion dollar industries and have been growing in popularity. As millions of fans watch these tournaments and online competitions, we are starting to see fantasy leagues pop up for eSports. Yet we know there are fantasy leagues available we have people who do not know about eSports or possibly do not have the knowledge about the professional scene of eSports. What if there was a tool that allowed people to take in professional in game statistics and incorporated that into a predictive algorithm that could compute the likely winner of a hypothetical game in the future?

Using statistical data taken from the professional scene of an online video game called Valorant, this project will try to predict possible game outcomes which can be used for fantasy sports and betting. Throughout the project different predictive models will be used to formulate algorithms and predictive descriptions on what the expected outcomes will be for games based on stats and game strategies used in professional play. This will allow all types of people to play and bet on who will win in the upcoming fantasy games.

Project Idea:

Valorant is an online first-person shooter competitive video game. It takes a great deal of time and mastery to get better and achieve the high levels of play that the professionals do. So instead of everyone in the world attempting to be the professionals, fantasy sports exist to give people the luxury of formulating teams and players to see what their opinions on who is best a real shot at playing the games. If there was a tool that existed to see different levels of possible stats that players may achieve, people could take their favorite teams and players statistics and put it into a model that game them back a certain level of chance that, that player or team had for winning in an upcoming match. This would serve newer players or people who are not as familiar with the pro scene a stepping stone into getting into fantasy eSports.

Background:

Right now, there is no tool that can take the professionals statistics of eSports players and tell you what could possibly happen in an upcoming game or fantasy game. With this project we could create models that allow you to incorporate the available professional players statistics and turn them into statistics on who has a higher chance of winning or losing in the next games. In popular games like league of legends, and Valorant there are what are called “Pick Em’s” that come around ever year. These Pick Em’s are for players to choose who will win in the upcoming world-wide championships. Players can earn in game cosmetics and rewards for their choices and with this project newer players might have a better chance to get rewards even if they do not watch the professional scene as much as others.

In Valorant different statistics can be recorded and almost all professional games ever played have been recorded online. Those stats can include but are not limited to; wins, losses, combat scores, kills, deaths, assists, damage, number of headshots, and many more. The idea behind this project is to take those statistics which are recorded and listed into a csv database and incorporate them into existing predictive analytics algorithms and try and predict based on the stats who will win or lose the game. For example, if the attacking team has a very high number of kills and low number of deaths than they have a higher chance of winning.

Not only can we incorporate all the different types of professional teams but we can even look at individual players and see statistics and analytics on if you have this player on a team who will be better than others, etc. Using these stats should give a good base description for who will win or lose the next games. This can be used in fantasy sports, Pick Em’s, or even just comparing stats with friends.

Modeling:

I will be using predictive analytics models for this project mainly in python for the bulk of the code. I intend on using; Random Forest Regression model, Support Vector regression, and Decision Tree Regression. Each of these models will give different approaches to models and allow me to possible use different models in different points of the data as well as different games. For example, if the RFT regression model shapes better than the DFT model for Valorant that does not mean it fits better for something else like League of legends data and this would allow me different approaches for my predictions. I may also use linear regression as a base stepping stone to poke around at data and learn what fits into what or which data is most present but I will not be using this as a main model within the project.

Tools:

I will be using a few programs and software's to expand this project. For this project there is a great deal of data over 250,000 instances. For this amount of data, I will need Microsoft Excel in the form of csv files to be able to maintain a database with everything I need. In order to really understand the data, I have I will want to use some visualization tools and for that I will use Tableau as it will easily allow me to use large data pool and make it readable and easy to understand. I then will use python to manipulate, scrub, and maintain the data to formulate into my models.

Python is great with many things I will need like modeling and utilization of libraries that I will need. Those libraries include but are not limited too; NumPy, Pandas, Seaborn, Matplotlib, Math, and Sk-learn. I will use these libraries in order to take preexisting models and use them to formulate my predictions so I do not have to invent any algorithms for this project. Although python will be my main tool within the project, I may need to venture into R for more statistical analysis depending on the situation.

Conclusion:

Esports has been booming all across the world over the past couple of years. The question of is eSports is talked about a lot but what is certainly not talked about is the number of tools in the eSports worlds that allow for people to take data into the professional scene. With this project it will allow the use of professional statistics across video game fantasy everywhere and be able to predict possible game results for use in those situations. Whether you want to bet on your favorite team or earn rewards in this years Pick Em's you will soon be able to use this project to help predict what chances you have at earning those rewards.

With the use of; Python, Tableau, Microsoft Excel, R, and many different python libraries I will be able to predict game results based off of professional stats. I will be taking the stats from many different databases and video games mainly focusing on Valorant and possibly other games like League of Legends. This project will be the first in the world of predictive analytics for eSports fantasy leagues and allow not only avid gamers to participate in fantasy leagues and Pick Em's but also involve casual game watchers or players as well.

References:

Kaggle Datasets: https://www.kaggle.com/datasets/qualidea1217/valorant-pro-matches-since-april-2021

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