

Project Proposal: Ranking A Network of Smash Ultimate Players

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1 Introduction

Super Smash Bros Ultimate is a fighting game with a crossover of characters from various Nintendo games and franchises. The game series has been around since 1999, and Ultimate is its fifth game. It's a very popular game globally, and as a result, there are players world-wide competing to be the best. Between February and July of 2019, a Twitter user with handle "stu2b50" compiled a dataset with every game played in 10 different tournaments (each with 800+ competitors and upwards of 2000 players) onto the website <https://statsmash.io> and we will be using this dataset to rank the top players that participated in these tournaments.

The dataset contains an entry for every game played in these tournaments, including over 28,000 games and almost 10,000 players. We pruned the dataset to remove games with missing players because these games are not interesting to us. From this list of game results, we can construct a network of players with edges that represent players' results against each other.

2 Plans & Objective

From the game records, we will construct a graph with players as nodes and games as weighted directed edges, where (i, j) represents that i has lost to j , with the weight $\frac{1}{2} \leq w \leq 1$ being the proportion of the games between the two that i has lost. Note that $w = \frac{1}{2}$ indicates that i and j have played against each other and lost an equal number of games.

Since there are directed cycles, there exists no natural topological order and we must devise a ranking ourselves. We plan to use graph ranking algorithms, such as PageRank, to formulate a ranking among the players and compare our results with the historical results of the tournaments.

Also, we will be able to compare our generated rankings to the ELO ranking published on the statsmash.io website, modified from the standard FIDE system for chess player rankings. ELO rankings are computed in real time - they are dependent on the current rankings of the players. Our rating mechanism will be computed only after all games have been played, and we will try to find a way to do so that mimics the ELO ratings.