



# BeatQuest: Beat Saber Elo System

## INFO253 Fall 2021 Project Proposal

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### Introduction

Vivek Nair, the principal architect of this project, is a Division 1 e-sports athlete and plays Beat Saber for the Cal e-sports team in the Collegiate VR Esports (CVRE) league. Beat Saber is a virtual reality rhythm game with over 4 million players. It was released in 2018 and acquired by Facebook in 2019. Since late 2018, competitive Beat Saber events have been regularly held, typically using a round-robin or double-elimination bracket system. Berkeley is one of the dozens of US colleges that regularly participate in inter-collegiate Beat Saber tournaments. However, unlike more well-known competitive games like Chess, no official competitive ranking system for Beat Saber exists to date.

### Elo Rating System

The Elo rating system, named after its creator Arpad Elo, is an algorithm for quantifying the relative skill levels of players in zero-sum games such as chess. Players start with a fixer rating (eg. 1000), which is then updated over time as they win or lose matches against other players, by comparing the outcome of a match to the expected outcome based on the relative scores of the two competitors. Open-source libraries exist to simplify the implementation of an Elo rating scheme within JavaScript.

### BeatQuest Project

We seek to implement the Elo Rating System, popularized by its use in Chess, within the Beat Saber competitive scene. Our front end will display the current Elo rating of all known competitive Beat Saber players, including a leaderboard of the highest-performing competitive Beat Saber players in the world. It will pull recent match results from the APIs provided by several well-known Beat Saber tournaments to ensure the scores and ranking remain up to date. For each player, we will display a chart of their rating over time, as well as how many points they gained or lost from each match that they played. We will also automatically issue titles to top players (eg. Beat Master and Saber Master), similar to the titles that currently exist in chess (eg. International Master and Grand Master).

### More Information

[https://en.wikipedia.org/wiki/Beat\\_Saber](https://en.wikipedia.org/wiki/Beat_Saber)

[https://en.wikipedia.org/wiki/Elo\\_rating\\_system](https://en.wikipedia.org/wiki/Elo_rating_system)

<https://github.com/moroshko/elo.js>