The Importance of Matchmaking in League of Legends

Jon Decelle
Gabriel Hall
Lindsay O’Donnell
Introduction and Problem Statement
Online Games

- In online games, players connect to one another over a network and play with each other.
- Some games are 1v1, while others are team based.
- In many of these games, players’ skill levels can vary widely.
- For enjoyment, players want to play with other players of similar skill.
• Matchmaking places players of similar skill together in a match.
• Better matchmaking algorithms form more even matches.
• Matchmaking needs to be fast
Multiplayer Online Battle Arena (MOBA)

- Competitive, team based
- Win the game through killing enemy structures
- MOBAs are session based, so players develop skill and increase their ranking by winning games
League of Legends (LoL)

- Most popular current day MOBA [Forbes 2012]
- Free to Play
- Developed by Riot Games in 2009
- WPI has many LoL players to study
Ranking and Matchmaking in LoL

- Each player has a visible rank and a hidden matchmaking rating (MMR)
- This rating is based on the Elo formula, originally designed for chess
- LoL ranks: Bronze, Silver, Gold, Platinum, Diamond, Master, and Challenger.
Research Questions

- How balanced is matchmaking in LoL?
- How long do players wait for a match?
- How do players perceive how well matchmaking works?
- What factors affect player enjoyment?
Section 2

Study Methodology
Study Methodology Overview

- Collect player ranks to determine how evenly matched teams were by rank
- Collect player perceptions of how even game turned out
- Collect game data to show how even game was statistically
- Compare these to see how much of an impact matchmaking has on game
Study Advertising

- Solicited subjects by emailing IMGD majors, Gaming club, and asking friends
- Offered open time slots for subjects to come in
- Held studies on the weekend when more people are generally free
Study Regulations

- Players signed consent forms
- Players set up their game settings
- Asked to play 5v5 games, solo queue only as this affects the matchmaking
- Play Ranked if possible
  - Uses their Ranked MMR which is represented by their visible rank
Surveys

- Collected demographic player information pre-game
- Collected player perceptions post-game
- Done before and after each game
  - Game was fresh in player’s mind
Environment

- Computer lab where all the players could see, hear, and talk to one another during games.
- Many subjects came in groups
  - Although they were playing separately, often interacted
Matchmaking Data Collection

- Collected ranks of each player in each game through third party website while game in progress
- lolnexus.com
Player Survey

- After each game:
  - Game enjoyability
  - Game evenness overall and at different times during game
  - Reasons for win or loss
  - Outlier players
Game Data

- Collected game data from Riot’s match history website:
  - Gold difference at 20 minutes and at the end of game
  - Kills for each team
  - Game time
  - KDA for each player
  - Position played
Even vs Uneven

There are many measures to show how even or uneven a game was:

- Kill difference
- Gold difference (Gold is obtained by killing enemies and enemy structures)
- Game Time (If one team is far ahead, they are likely to finish the game quickly)
Section 3

Analysis and Results
Study Results and Demographics

- 23 unique participants
- 3 studies, 5 hours each
- 65 games, 52 complete and valid surveys
  - Website for data collection went down during one study
How does queue time correlate with rank?
Does better teamwork lead to higher player enjoyment?

- Axes:
  - x: “How well did your team work together?”
  - y: “How enjoyable was the game you just played?”
- The line of fit shows the positive correlation between these responses.
Are even games more fun?

- Axes:
  - x: “How even was the game you just played?”
  - y: “How enjoyable was the game you just played?”