

# GameNite Upgrades: Matchmaking, Leaderboards, and Friends

Team 413: Motto Sereeyothin, Hanfu Yao, Qingnan Li, Miguel Chica

## Project Description

Our team added ranked and casual automated matchmaking queues to GameNite for Nim and Number Guesser, using an ELO rating system to pair players of similar skill and track progression over time. Players can view their match history, ELO trends, and compete on global leaderboards to see how they stack up against others. A friend system allows players to compare stats, message each other, and view a friends-only leaderboard.

## Tech Stack and Design Decisions

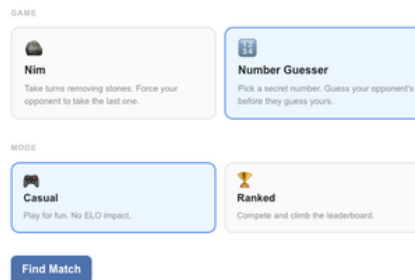
The project is built on a client/server/shared monorepo, using React on the frontend, Express on the backend, and MongoDB for persistence, with the shared package providing types and Zod schemas to keep both sides aligned. WebSockets handle real-time features like matchmaking events, disconnect handling, and live chat, while leaderboards, ranked history, and friend operations use REST endpoints for easier fetching and testing. The backend follows a controller/service/repository pattern, with feature logic in dedicated service files (e.g., `matchmaking.service.ts`, `elo.service.ts`), to keep route handlers thin and business logic centralized.

## Design Decisions

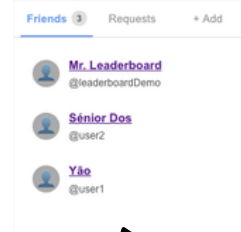
- **Consistent with existing patterns:** Extended the starter codebase and kept the repo/model structure, keeping controllers thin for readable route handling and placing feature logic in service files.
- **WebSockets:** for real-time features: Used for matchmaking events, disconnect handling, live chat, and game updates.
- **REST for static features:** Leaderboards, ranked history, and friend operations use REST endpoints, making them easier to fetch, test, and display.
- **In Memory Queue:** One notable tradeoff is that queue state is held in memory rather than a shared queue system — acceptable for a single-deployment class project, but a bottleneck if scaled further.

## Find a Match

Choose a game and mode, then jump in.

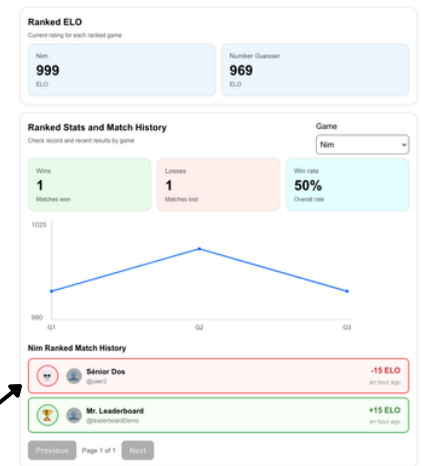


The 'Find a Match' Page. Choose your game and mode, then just wait until you find a match.



Friends list and actions

Your ranked stats



Leaderboards

Leaderboard mode: Global  
Select game: Number Guesser

Rank	Player	ELO	Record
#1	imgoodatgames	1059	4-0
#2	Sénior Dos	1017	1-0
#3	totallyNotADemoUser2	1016	1-0
#4	totallyNotADemoUser4	1016	1-0

## What's Next?

Next, we would expand both the ranked and social systems. Interesting additions would be seasonal resets, placement matches, private game invites between friends, and more advanced profile or messaging features. We would also want to refactor the matchmaking queue into a shared persistent system so the app could scale more reliably beyond a single class-project deployment.

## Access Our Project

Repository link: <https://github.com/neu-cs4530/spring26-project-spring26-project-413>

Deployed link: <https://spring26-project-spring26-project-413.onrender.com/>