

Live Demo: spring26-project-group-402-1.onrender.com

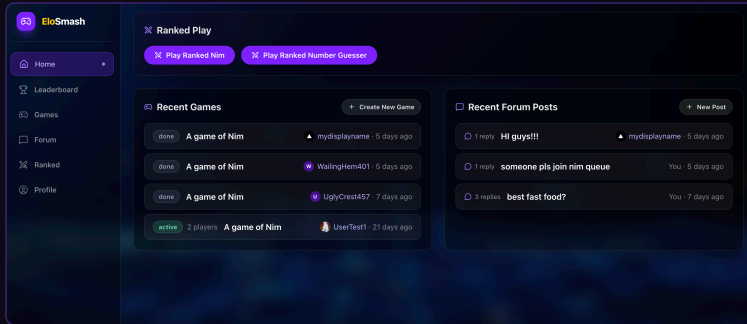
Source: github.com/neu-cs4530/spring26-project-group-402-1

ABOUT THE PROJECT

EloSmash transforms GameNite from a casual multiplayer platform into a competitive gaming ecosystem. Players compete in ranked matches of **Nim** and **Number Guesser**, with an adaptive Elo rating system, skill-based matchmaking, percentile-based rank tiers, per-game leaderboards, and rich user profiles with competitive statistics and rating history.

KEY FEATURES

- Adaptive Elo Rating System**
Per-game ratings with provisional K-factor (48→32) for faster new-player calibration. Server-authoritative updates.
- Skill-Based Matchmaking**
Expanding Elo search window ($\pm 100 \rightarrow \pm 600$) balances match quality with queue times.
- Rank Tiers & Leaderboards**
Bronze **Silver** **Gold** **Diamond** **GM** — percentile-based with podium for top 3.
- Enhanced User Profiles**
Elo history graphs, match history, win/loss records, streaks, profile pictures, and editable display names.
- Match Integrity & Auth0**
30s disconnect and 120s inactivity forfeits, navigation blocking, ranked rematches, and JWT-based authentication.



Home Page — Ranked play buttons, recent games, and forum posts



Profile Page — Rank badges, Elo graph, win/loss stats, and match history

TEAM CONTRIBUTIONS

Neil Agrawal

Database migration, matchmaking, rank tiers, Auth0 integration, deployment, UI polish

Justin Gubbens

Elo algorithm, rating model, post-match updates, profile expansion, match history, data visualization

Matthew Tung

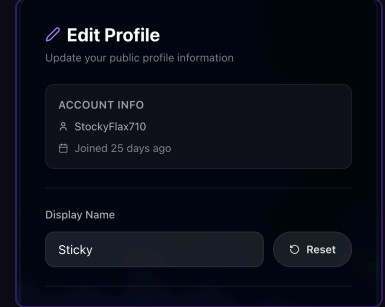
Ranked queue UI, matchmaking range, queue display, profile pictures, rematches, deployment pipeline

Ernest Chae

File hosting, anti-cheat checks, leaderboard system, forfeit enforcement, persistence testing pipeline



Ranked Queue — Elo, wait time, search range



Edit Profile — Display name & picture upload



Leaderboard — Per-game rankings with gold, silver, and bronze podium

TECHNOLOGY STACK

FRONTEND

React Vite Tailwind CSS

Socket.IO Axios Recharts

Framer Motion Auth0 SDK

BACKEND

Express Socket.IO MongoDB

Zod Auth0 JWT TypeScript

Node.js

TESTING & CI

Vitest Playwright Supertest GitHub Actions

DESIGN DECISIONS

TypeScript monorepo with a shared contract package ensures compile-time type safety across client, server, and socket events.

Decoupled Podium & Rankings Top 3 players fetch independently so the leaderboard podium loads instantly even if the full list is slow.

Matchmaking and queue logic are separated into independent services for testability. An atomic claim operation prevents race conditions during concurrent match attempts.

Three Parallel GET Requests Profile loads user info, rank, and match history independently so the page renders incrementally.

FUTURE WORK

Elo decay: Reduce ratings for inactive players to keep leaderboards fresh and incentivize continued play.

Seasonal resets: Time-bounded competitive seasons with leaderboard resets and end-of-season rewards.

Win-rate gating: Require minimum win rates within a rank tier before promotion, adding depth to the progression system.

Extended profiles: User bios, banner images, and additional games with independent Elo tracks and leaderboards.