

# CS4530 Final Project: “Nexus”

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## Project Overview:

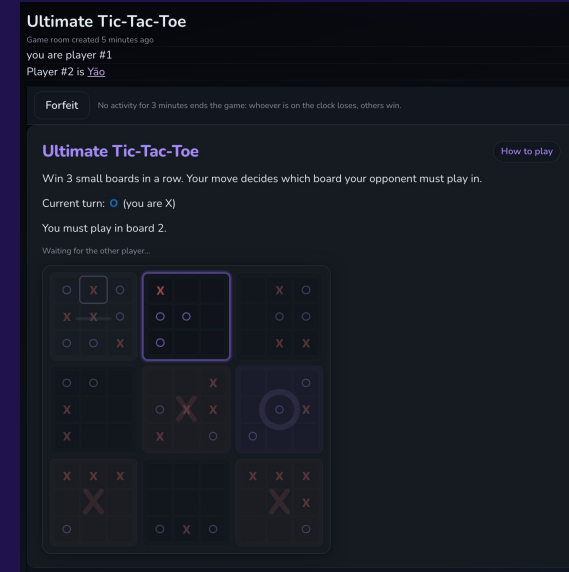
Nexus is a multiplayer browser-based gaming platform with comprehensive competitive infrastructure. Key features include a fully playable Ultimate Tic Tac Toe (UTTT) game, dynamic leaderboards with game-type filtering, persistent player profiles with statistics and achievement badges, match history with automated and step-through replay, and a complete social system featuring friends, game invites, rematch flows, and real-time notifications.

## Live Demo & Repository

- **Demo:**  
<https://spring26-project-spring26-project-group-qr74.onrender.com/>
- **GitHub Repo:**  
<https://github.com/NEU-CS4530-S26/spring26-project-spring26-project-group-207>

## What we Built:

We extended Nexus with Ultimate Tic Tac Toe using the existing game dispatch architecture so new games plug in consistently. We persist complete move histories so match history + replay can rebuild state move-by-move. Leaderboards use Mongo aggregation pipelines for dynamic, per-game-type rankings. Profiles combine match data into W/L/T, per-game breakdowns, win rate, and badge unlocks via an event-driven achievement path. Friends, invites, presence, and notifications run over Socket.IO. Rematch enforces two-sided confirmation before launching a follow-up game.



UTTT mid-game

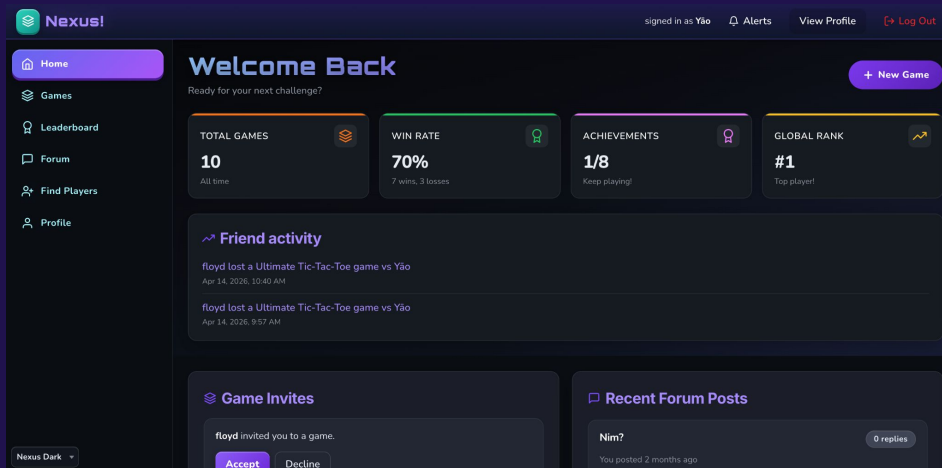
## Stack:

React + TypeScript frontend; Express backend; MongoDB persistence; Socket.IO for realtime; deployed on Render.

## Future Steps:

There are extensions we were not able to implement that would strengthen engagement, competition, and production reliability. With more time, we would deepen several systems beyond their current MVP scope. Examples include:

- UTTT AI opponent for offline practice and onboarding
- Data + query scaling
- Seasonal leaderboards + spectator / shared replays for community play



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