Club 305

CS 4530
Group 305
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PROJECT OVERVIEW

Club 305 is a real-time multiplayer game platform featuring Texas Hold'em Poker as its flagship game. Poker supports up to eight players with optional AI opponents powered by a PPO neural network, following standard Hold'em progression with a 60-second shot clock, automatic side-pot handling, and a 10-second cooldown between hands. The platform includes a friend system for social connectivity, private game lobbies with invite-only access and host controls, and mid-game join support.

The platform is built around a ClubBucks economy, a sitewide currency earned through gameplay that can be spent in a cosmetic shop on card decks, chip themes, avatars, night mode, and 2x earnings boosts. Player statistics are tracked per game, with poker-specific metrics like VPIP% and PFR% visible on profiles and during gameplay.

TECHNOLOGY STACK & DESIGN

Our platform is a real-time multiplayer game site built with React, TypeScript, Node.js, and Socket.IO, enforcing a server-authoritative architecture where clients receive only filtered PokerView projections scoped to each player's visibility through a PokerState/PokerView type separation. The poker engine operates on a persistent table model with seat-indexed state, following an explicit round state machine (waiting → pre-flop → flop → turn → river → showdown) with server-side logic handling dealing, blinds, turn rotation, action validation, and side-pot construction from cumulative hand contributions. AI opponents are driven by a PPO actor-critic network trained in Python/PyTorch and deployed via ONNX, resolved through the same PokerMove interface as human players with difficulty controlling policy adherence (60/80/100%).

ClubBucks economy and cosmetics are persisted on MongoDB UserRecords, while poker-specific statistics (VPIP%, PFR%, contributed win rates) are isolated in a dedicated PokerStatsRepo to minimize write overhead. Friend requests live in a separate FriendRequestRepo for independent querying, with all social mutations and game invites broadcast over WebSocket to personal socket rooms for real-time sync.

FUTURE WORK

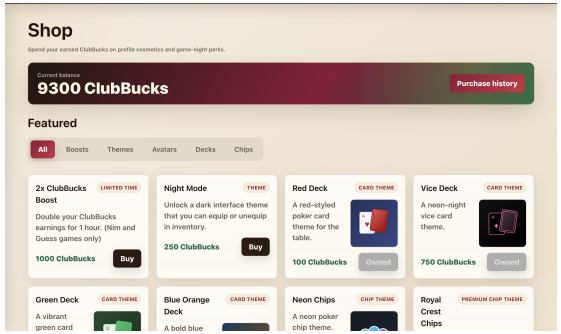
A possible extension to the features could be allowing users to purchase ClubBucks through real-life currency through Stripe API calls. This would allow those who do not have the time to play games to accrue ClubBucks quickly. We could also look into creating weekly poker tournaments that is set up automatically by the server which allow users to play with higher stakes and rewards.

On the AI side, we could train the PPO model on larger hand histories and incorporate player-adaptive behavior using the already tracked user metrics.

DEMO AND SOURCE

Our demo site is available at [DEMO URL], and our code at [REPO URL].

Texas Hold'em Poker table



ClubBucks shop and cosmetics