

Pranav Pipariya

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EDUCATION

- **Indian Institute of Technology, Roorkee** Roorkee, India
BS-MS (Economics), 3rd Year CGPA: 7.118 — 2024
Relevant Coursework: Risk and Insurance Economics, Advanced Statistics, Advanced Microeconomics, Game Theory, Advanced Econometrics, Mathematical Methods, Optimization Techniques, Monetary Economics, Public Finance
- **Kiddys Corner Hr. Sec. School** Gwalior, India
Intermediate (Class XII) 94.20% — 2021

EXPERIENCE

- **PaAC, IIT Roorkee** Roorkee, India
Developer May 2024 – Present
 - **Internal Tools Development:** Built test platforms for *Integration Bee* and *Cosmic Voyage*, streamlining test-taking; led 5+ math/web engineering projects using Python, Typescript and C++.
 - **Full-Stack Web Engineering:** Developed club site in React + Tailwind with Contentful; implemented modular components, code splitting, image optimization, form validation, and CI/CD with GitHub Actions.

PROJECTS

- **SwipeMarkets** Next.js, Solidity 2025
Leveraged Prediction Markets (Mobile-First)
 - **Leverage Logic:** Built on-chain 2x/5x/10x leverage using isolated margin pools and an internal bankroll counterparty contract.
 - **UX Innovation:** Designed a gamified "Swipe-to-Bet" interface, significantly reducing interaction friction for high-frequency binary option trading.
- **Entropy Arcade** Solidity, Next.js, Pyth Entropy 2025
Provably-Fair On-Chain Games
 - **Verifiable Randomness:** Engineered non-custodial Plinko, Spin the Wheel, Poker, Mines using Pyth Entropy; implemented commit-reveal schemes on-chain.
 - **Protocol Design:** Wrote gas-optimized Solidity contracts handling ETH staking, payout ratios, and callback verification.
- **Obscura** Next.js, ZK Email, Circom 2025
Privacy-Preserving Whistleblowing System
 - **Zero-Knowledge Proofs:** Utilized `zk-email` to prove domain ownership (e.g., @gov.in) without revealing sender identity.
 - **Circuit Design:** Wrote custom Circom circuits verifying DKIM signatures; outputs a nullifier to prevent double-signaling.
- **ConsensusKV** Go, Raft 2025
Distributed Key-Value Store
 - **Raft Consensus:** Architected a fault-tolerant distributed key-value store in Go, implementing Leader Election, Log Replication, and Heartbeats from scratch for strong consistency.
 - **Fault Tolerance:** Achieved partition tolerance (CAP theorem); system remains available if $(N - 1)/2$ nodes fail.
- **CognifyCL** Next.js, D3, llama.cpp 2025
Local-LLM Knowledge Graph
 - **Offline Inference:** Integrated quantized TinyLlama (GGUF) via `llama.cpp` to generate browser history summaries locally.
 - **Visualization:** Built a sync bridge between a Chrome Extension and a D3.js interactive force-directed graph.
- **Slug Park Duels** Godot 4, GDScript 2025
2D Multiplayer Physics RPG
 - **Game Engine:** Engineered physics-based movement and collision resolution; implemented a deterministic state machine loop.
 - **Multiplayer:** Built local shared-screen multiplayer with input arbitration and frame-synchronized interactions.

SKILLS

- **Languages:** Go, C++, Solidity, TypeScript, JavaScript, Python, Circom (ZK)
- **Frameworks:** React, Next.js, Node.js, Tailwind, Godot 4, Hardhat, Wagmi
- **Tools:** Git, Linux, Docker, BoltDB, MongoDB, Contentful, llama.cpp, Pyth Oracle
- **Domains:** Distributed Systems, Zero-Knowledge Proofs, Game Theory, EVM

ACHIEVEMENTS

- **Winner — Residency Trihackathon (2025):** Secured 1st Place in Real World Application track & 3rd Overall with **SwipeMarkets**. Awarded \$500 in prizes & amenities.
- **ETHOnline 2025:** Built *Entropy Arcade* using Pyth Entropy; codebase currently under review by Pyth maintainers for inclusion in official SDK examples.
- **Academic & Extra-curricular:** PRMO Qualified (Math Olympiad); Best Delegate (IITR MUN); Colours Trophy Runner-up.