ULTIMATE CHICKEN HORSE 3D

ACG Project Presentation

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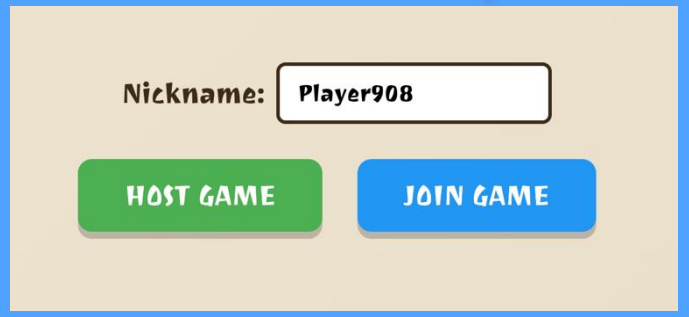
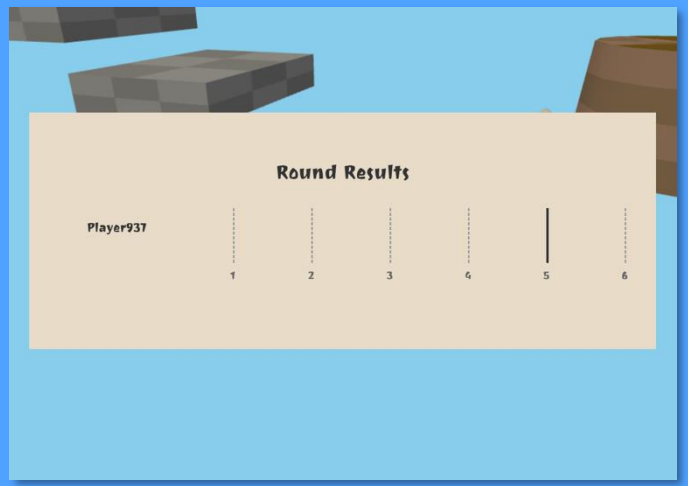
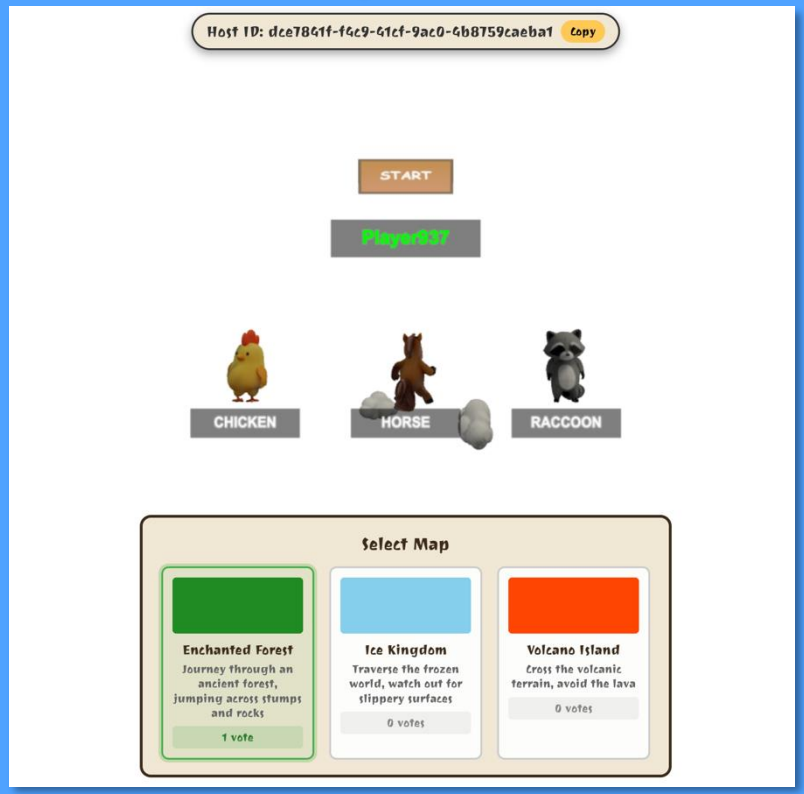
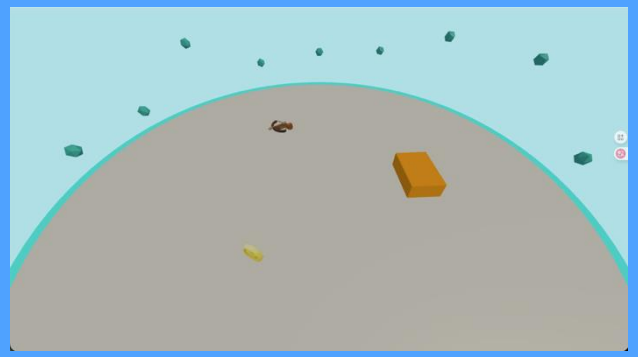
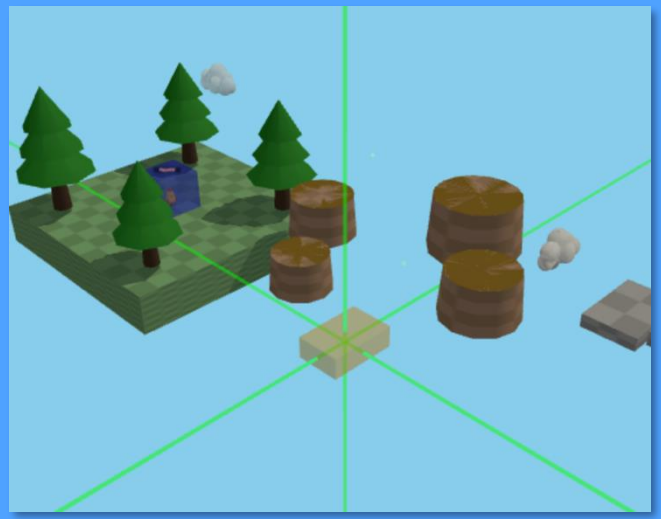
Game Loop & What's playable











System Architecture

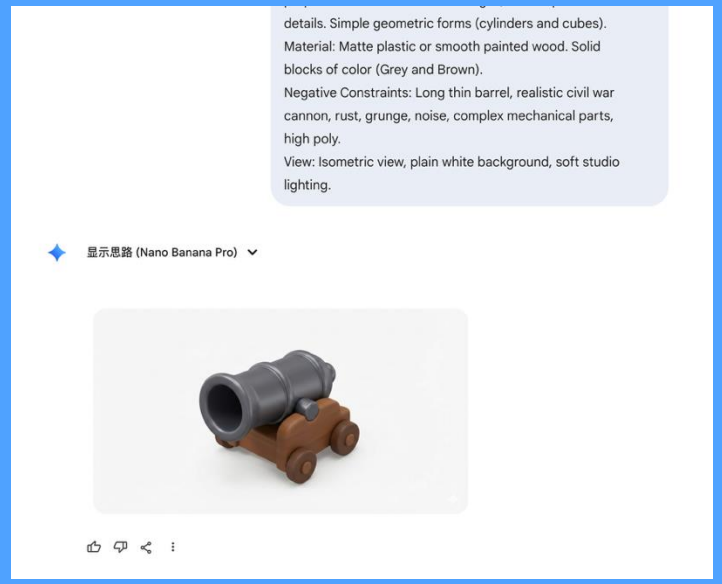
- **Rendering:** Three.js + custom Toon shading pipeline
- **Physics:** Cannon-es rigid body simulation
- **Networking:** Peer-to-peer multiplayer via WebRTC
- **Interaction & UI:** In-world 3D UI + HTML overlays
- **Deployment:** Web-based, no installation required

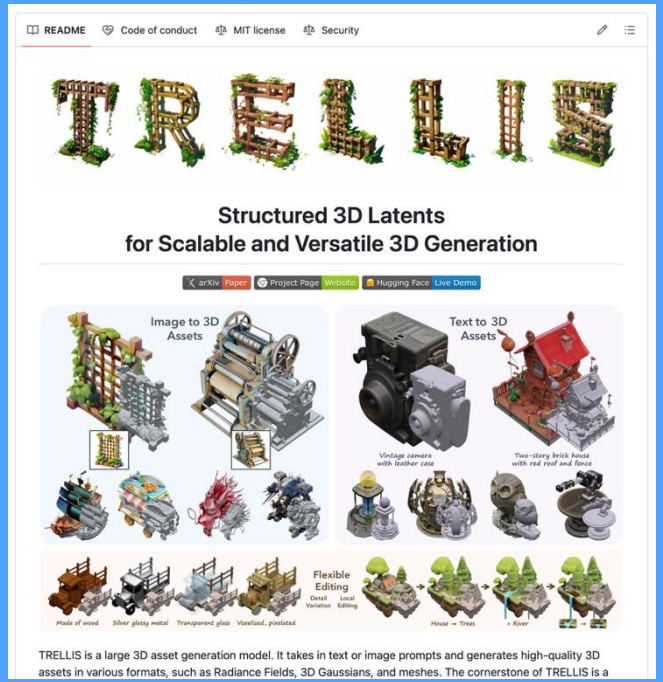
Stylized Toon Rendering

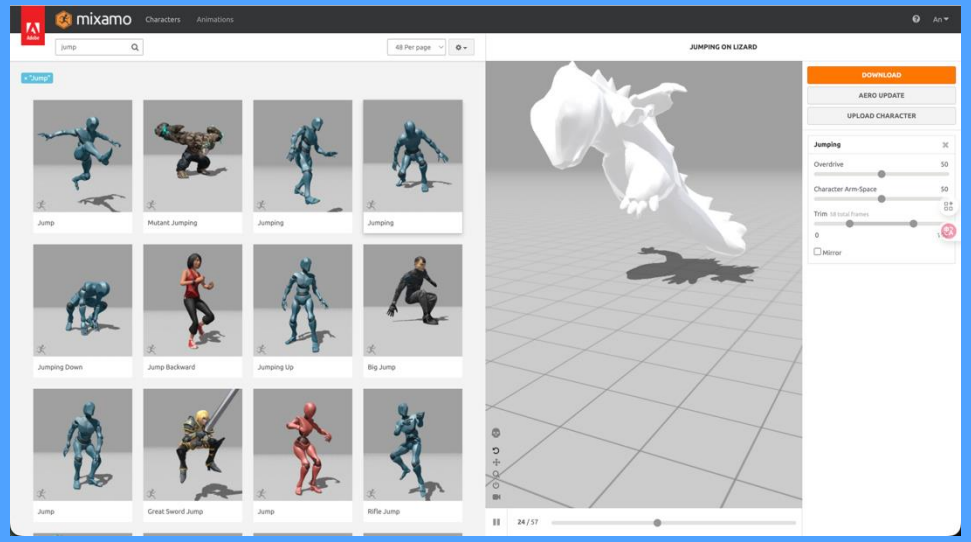
Stylized Rendering Pipeline

- MeshToonMaterial with 16-step gradient map
- Clear light banding for cartoon aesthetics
- Shadow mapping enabled for depth and readability
- Unified material conversion during asset loading

Character Asset Pipeline & Animation System







Asset Creation Pipeline

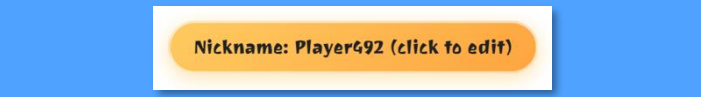
- Concept generation → 3D reconstruction
- Mesh cleanup & normal control in Blender
- Auto-rigging with Mixamo (with manual landmark guidance)

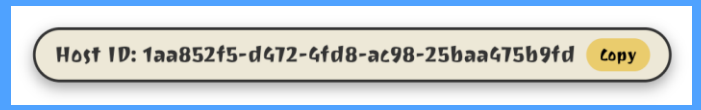
Physics

Physics-driven Gameplay

- Cannon-es rigid bodies
- Contact materials for different surfaces
  - default ground
  - slippery ice
- Platforming refinements:
  - stable ground detection
  - jump tolerance
  - anti-stuck handling

Online Multiplayer (P2P)





Online Multiplayer System

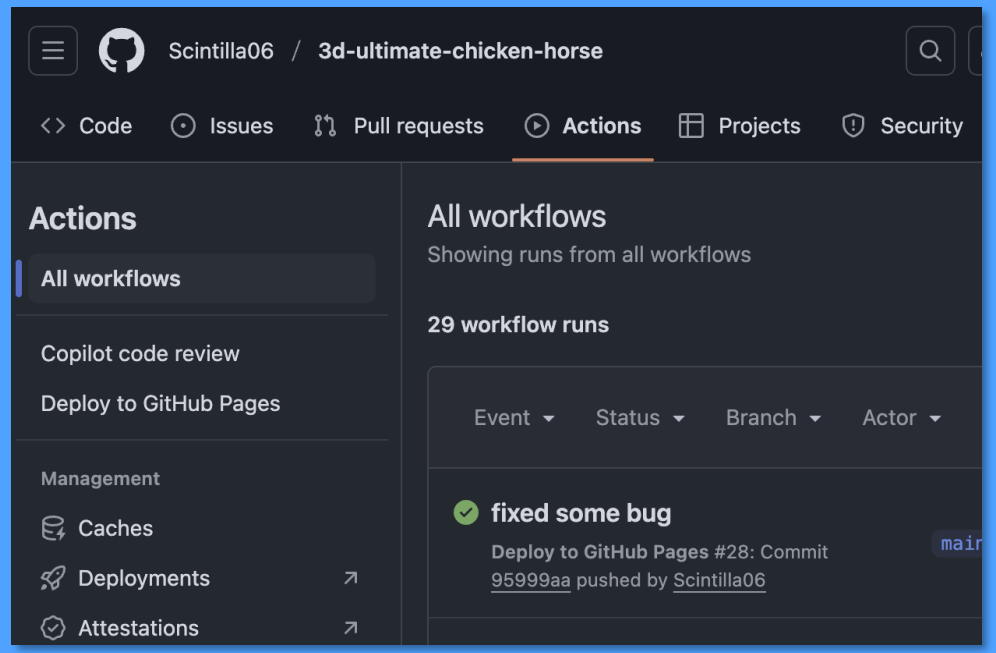
- Peer-to-peer architecture using WebRTC (PeerJS)
- Host-authoritative lobby and game flow
- Packet-based protocol:
  - lobby state
  - chat & map voting
  - build actions
  - gameplay events

UI/UX & Audio Polish

Polish & Player Feedback

- In-world 3D clickable UI (raycast buttons)
- Map selector + vote counts, chat overlay, score & win screens
- Audio: unlock on user gesture, preload, event-driven SFX/BGM

Deployment & Live Demo



- Web-based, no installation
- Automatically deployed via GitHub Pages