

# ULTIMATE CHICKEN HORSE 3D

**ACG Project Presentation**

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# Game Loop & What's playable

Nickname:

HOST GAME

JOIN GAME



Host ID: dce7864f-f4c9-41cf-9ac0-4b8759caeba1 [Copy](#)

START

Player937

CHICKEN

HORSE

RACCOON

Select Map

Enchanted Forest  
Journey through an ancient forest, jumping across stumps and rocks  
1 vote

Ice Kingdom  
Traverse the frozen world, watch out for slippery surfaces  
0 votes

Volcano Island  
Cross the volcanic terrain, avoid the lava  
0 votes



Round Results

Player937

1	2	3	4	5	6



# 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

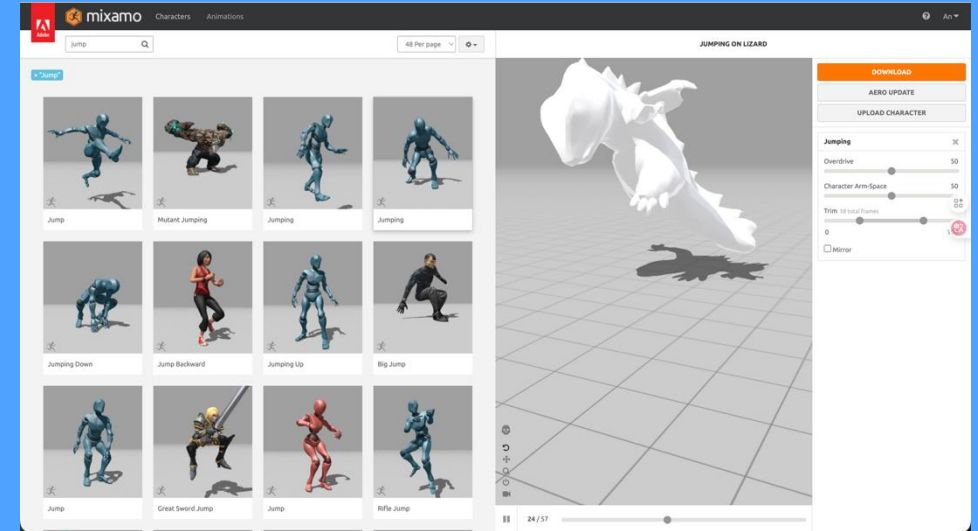
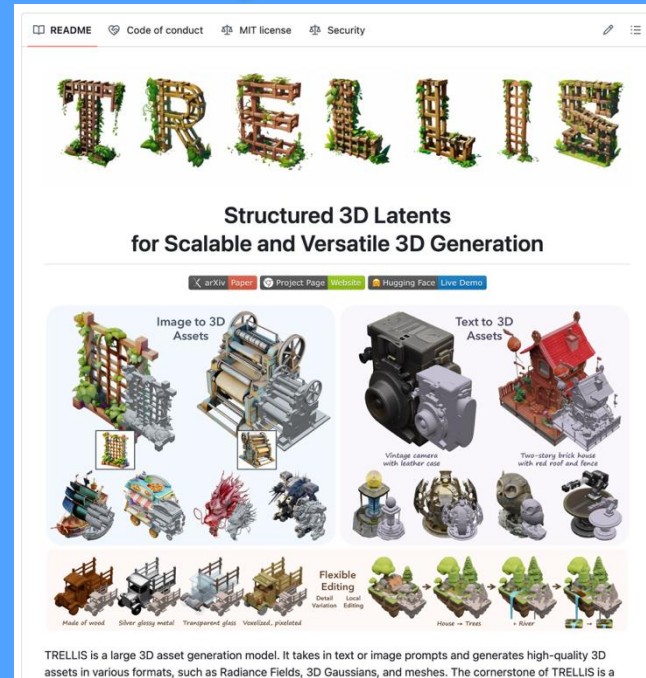
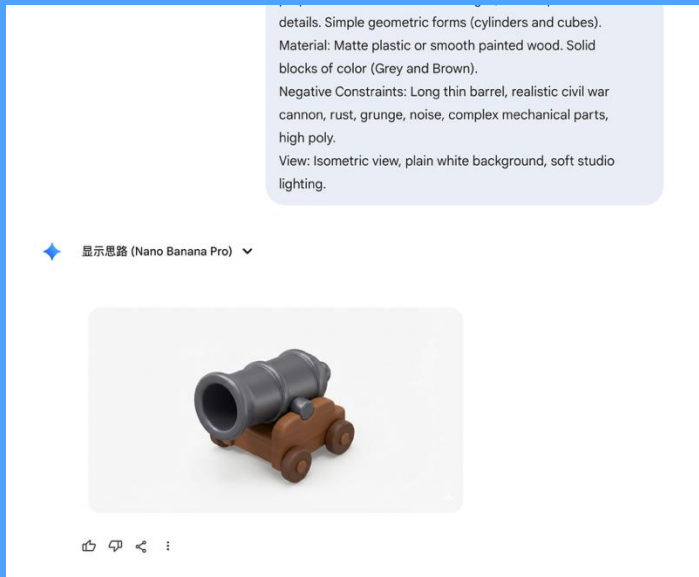
# Stylized Toon Rendering



## 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)



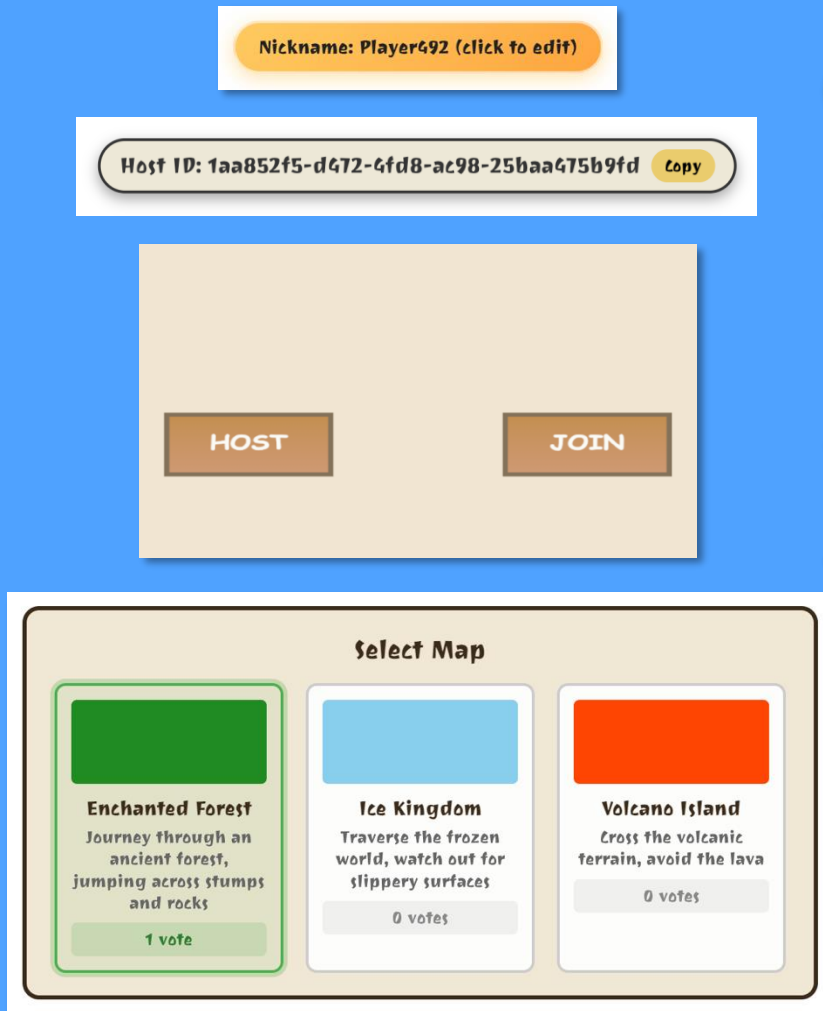
# Physics



## 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

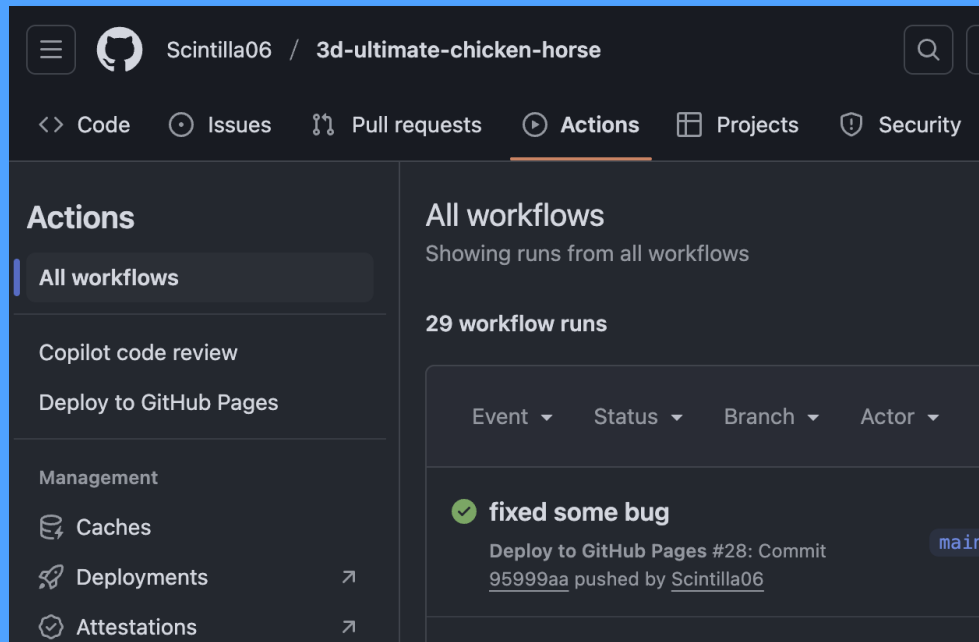
# UI/UX & Audio Polish

## 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