FAMU-FSU College of Engineering

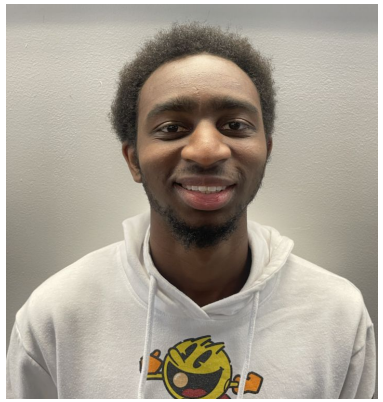
FAMU-FSU AI-VR Museum DR5

03/17/2025, Team 314

Team Members

Jaewan Mcpherson - Team Leader

Evan Rundlett - AI Implementor



Christian Higgs - Primary Developer

Devin Nobles - Secondary Developer

Jason Muse - Blender Expert

Ethan Myers - Creative Lead

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Sponsor and Advisors

Sponsor:

Google

Advisors:

Dr. Shonda Bernadin

Dr. Migara Amarasinghe

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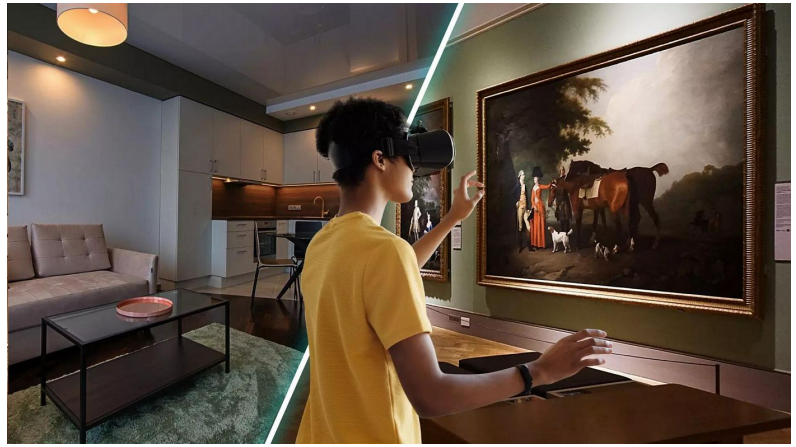
Introduction

What is the VR museum?

- A creative, artistic museum experienced entirely in VR.
- Explores the intersection of **arts, science and artificial intelligence**.
- Users explore and interact with immersive exhibits with VR headset controls.



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Introduction cont.

Why are we building this?

- To **educate and inspire** students on topics that blend creativity and engineering
- Show the **future of AI in artistic and educational environments**
- Encourage exploration of culture history, and innovation

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Introduction cont.

Currently established exhibits:

- A.I. Arcade
  - A.I. Maze
  - Real or AI quiz
- Fashion
- African Culture
- FAMU-FSU COE History
- Planetarium Room
- Animal/Dino Room
- Musical History Room
- Gravity Lab
- History of AI Room

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Needs/Requirements Recap

- ✓ Need to involve Artificial Intelligence.
- ✓ Need to be displayed in VR.
- ✓ Needs to be interactive.
- ✓ Needs to display historical and artistic exhibits.

- ✓ AI shall help create and modify the exhibit.
- ✓ Exhibits shall be designed for an immersive VR experience.
- ✓ Shall have exhibits change or play audio when users interact with them.
- ✓ Visitors shall explore rooms dedicated to classical music ,paintings and sculptures, bringing the museum to life in a 3D environment.

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Final Concept Recap

Choice 1:

VR
AI
3D Modeling
Interactivity
Artistic/ Historical Expression
Game Engine

Midjourney

SUNO

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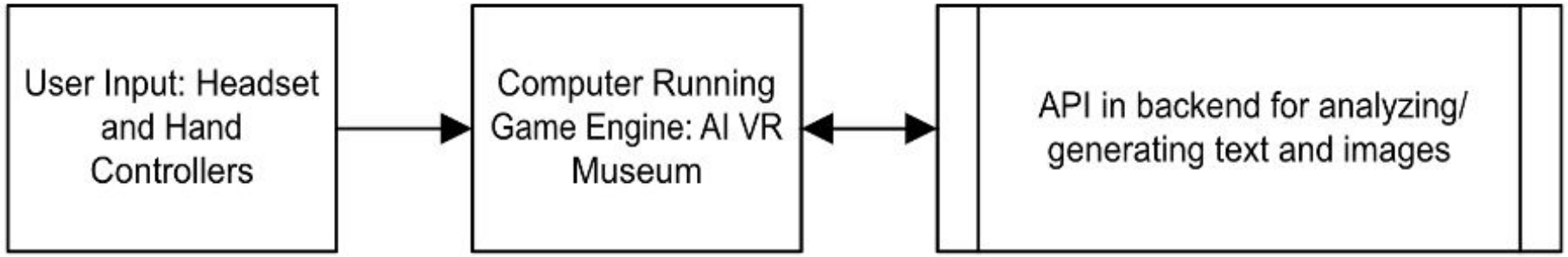
Preliminary Design



High-Level Block Diagram:

- Our design has 3 components:
  - VR headset
  - Computer running the game
  - AI API backend for generative features

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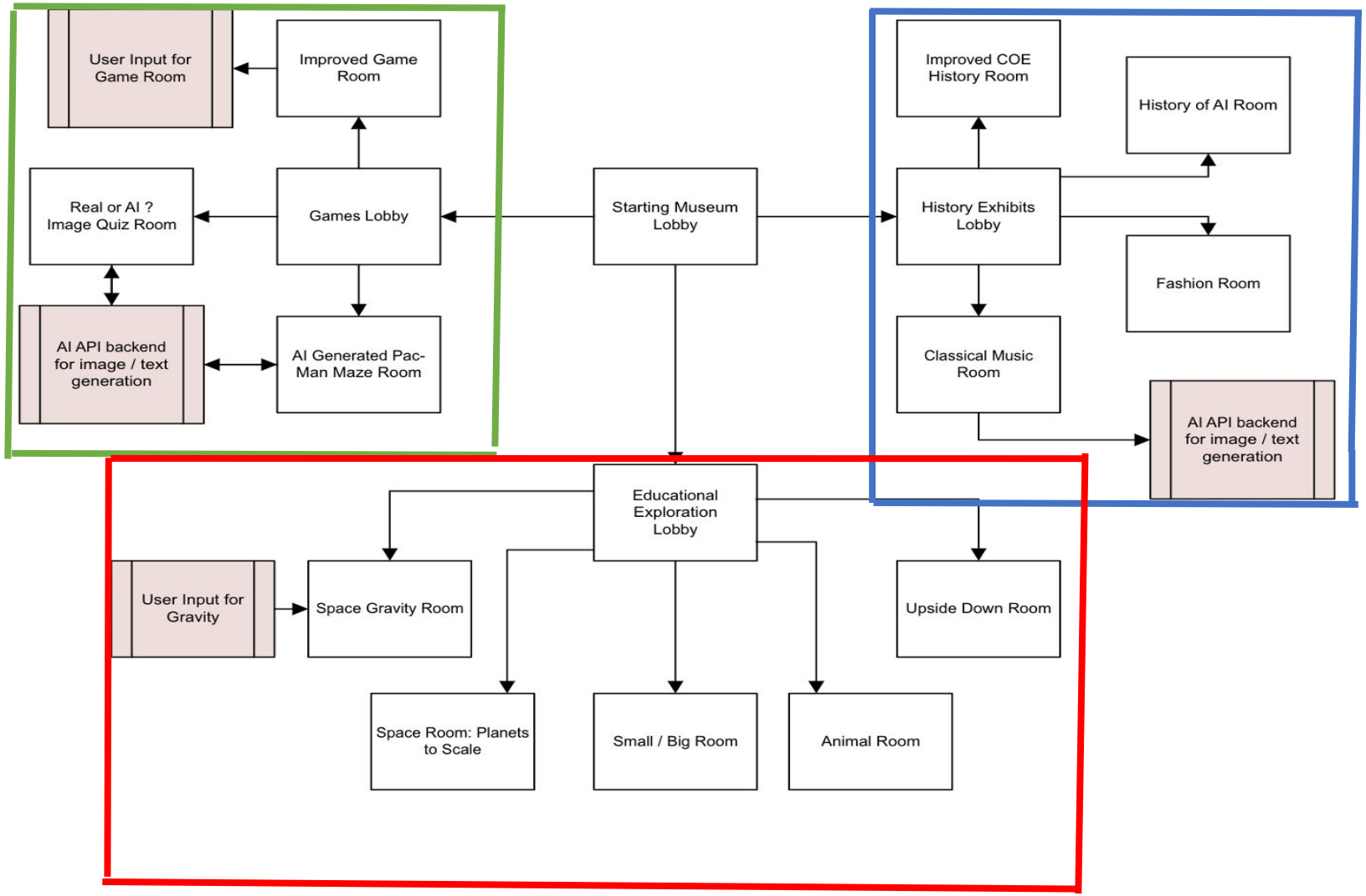
Old Design



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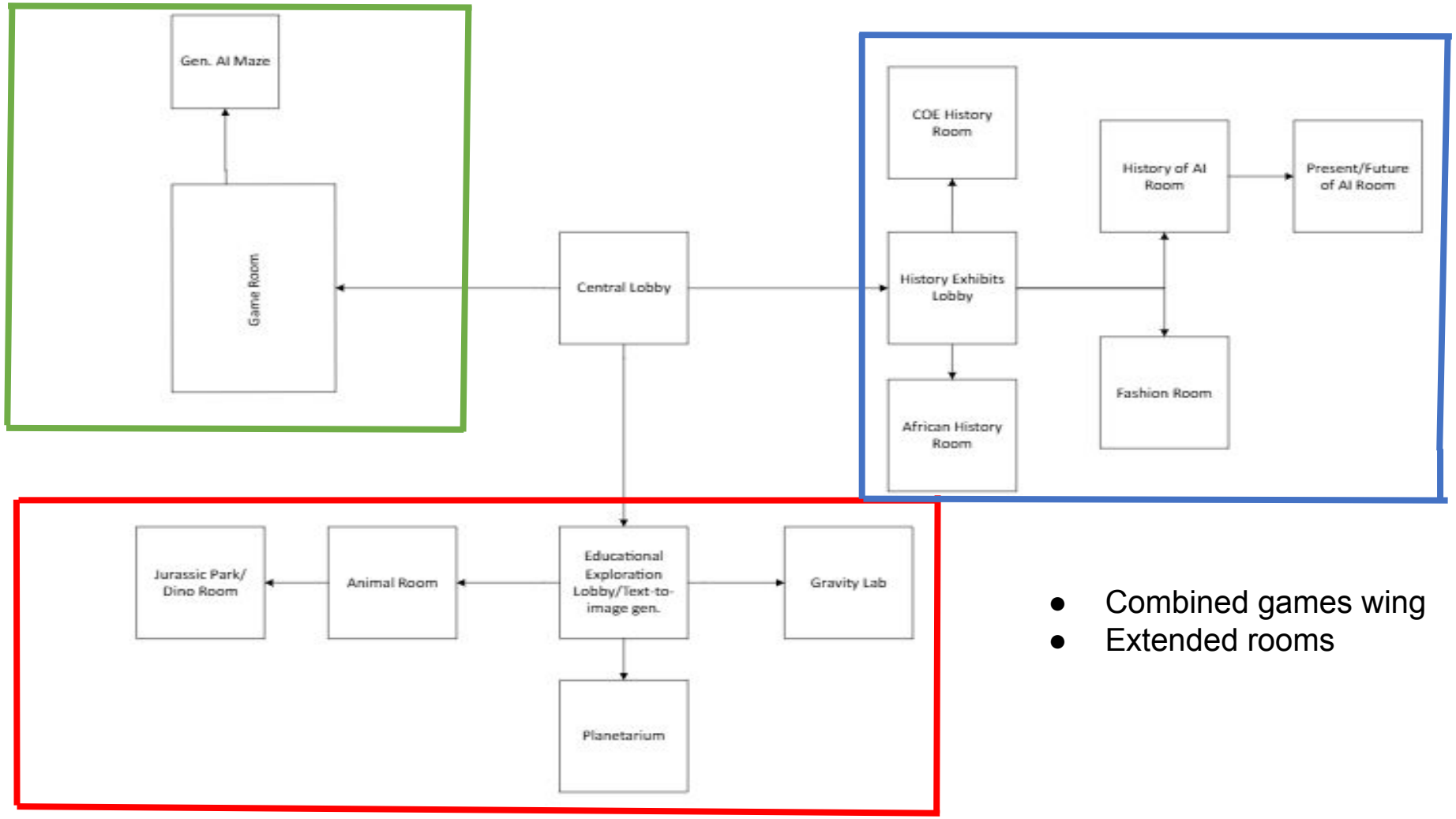
Updated Design



- Combined games wing
- Extended rooms

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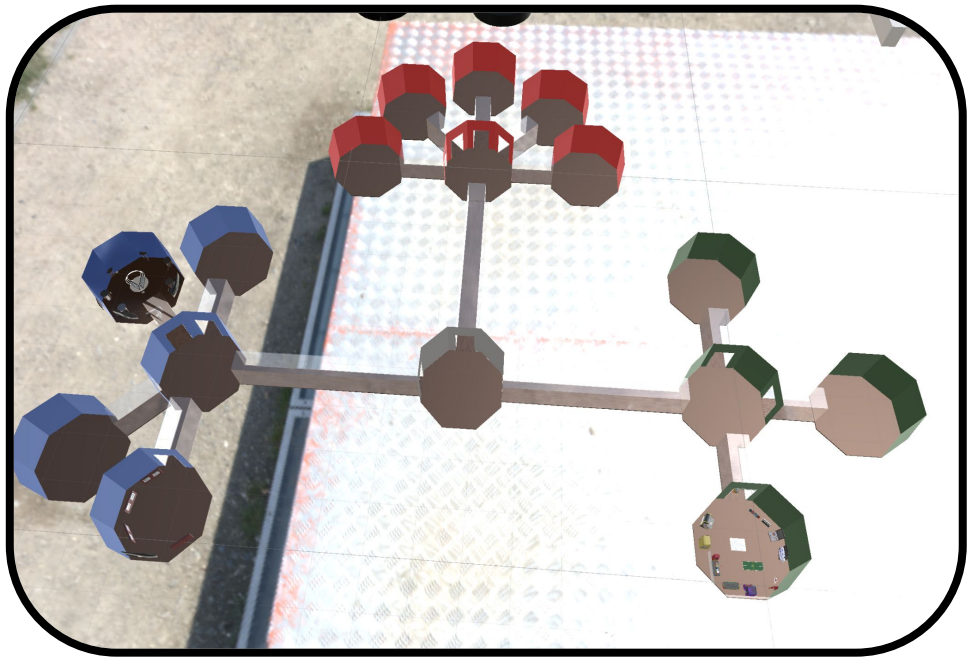
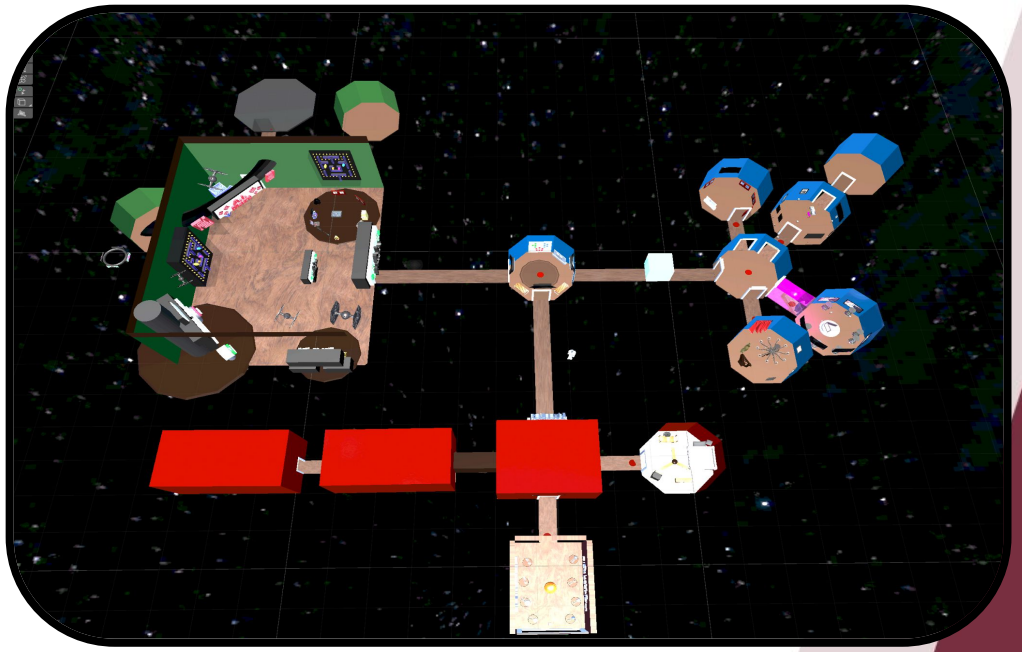
Work Update

- Completely revamped layout
- Models/exhibits are complete for almost all rooms
- Some interactive features added
- New animations





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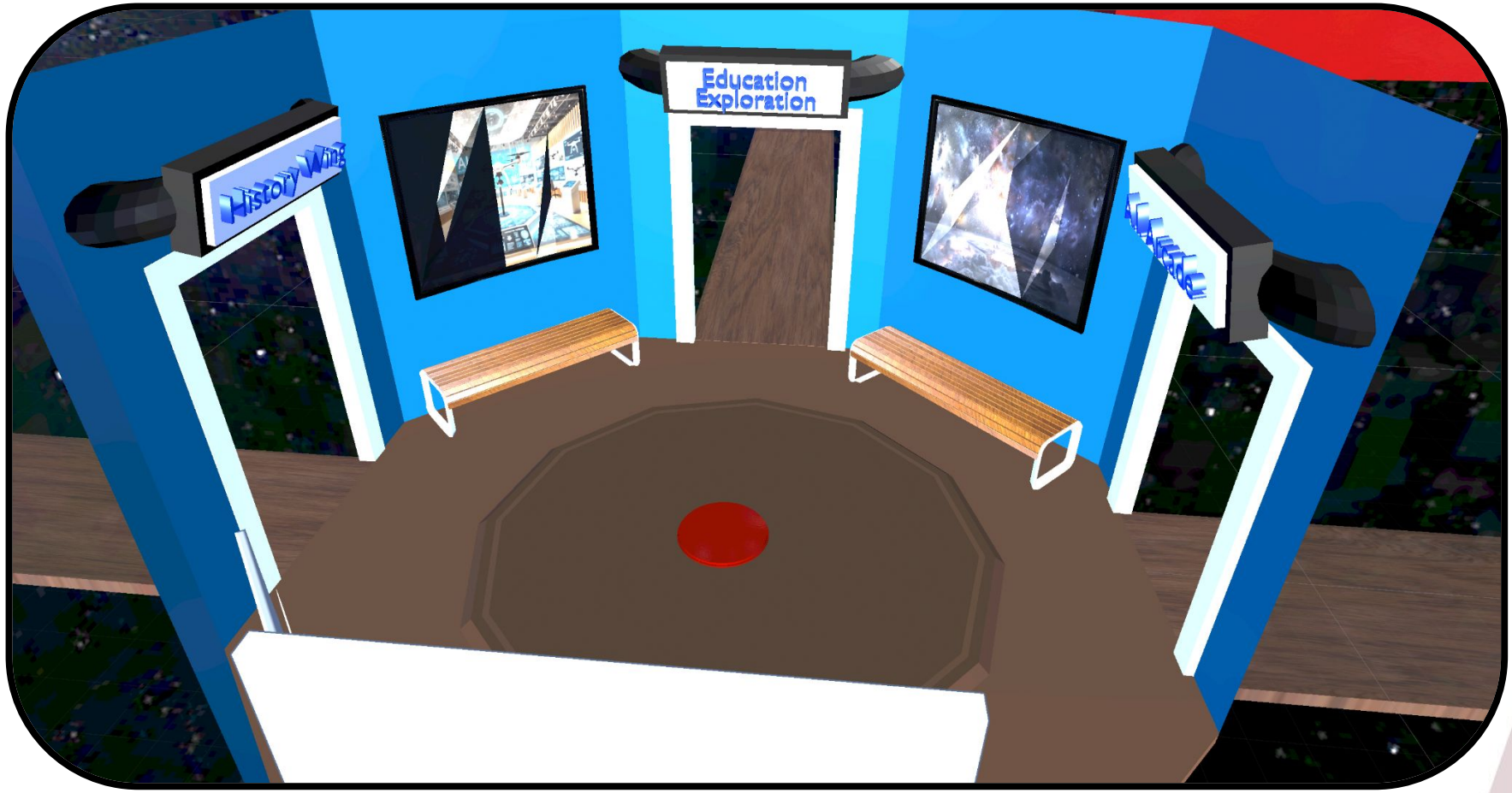
Updates Continued…

NEW MAIN LOBBY



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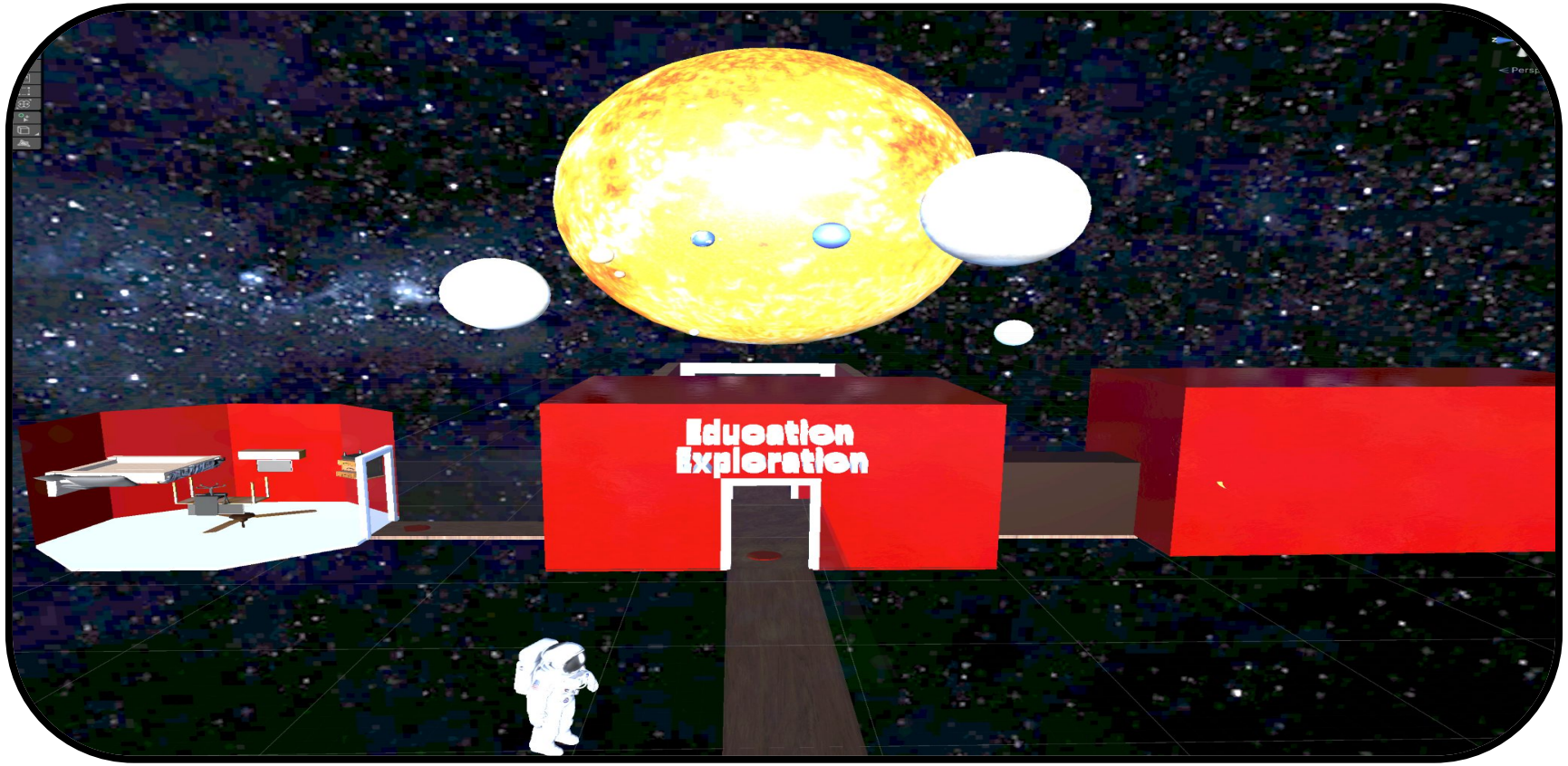
Updates Continued…

NEW EDUCATION EXPLORATION WING



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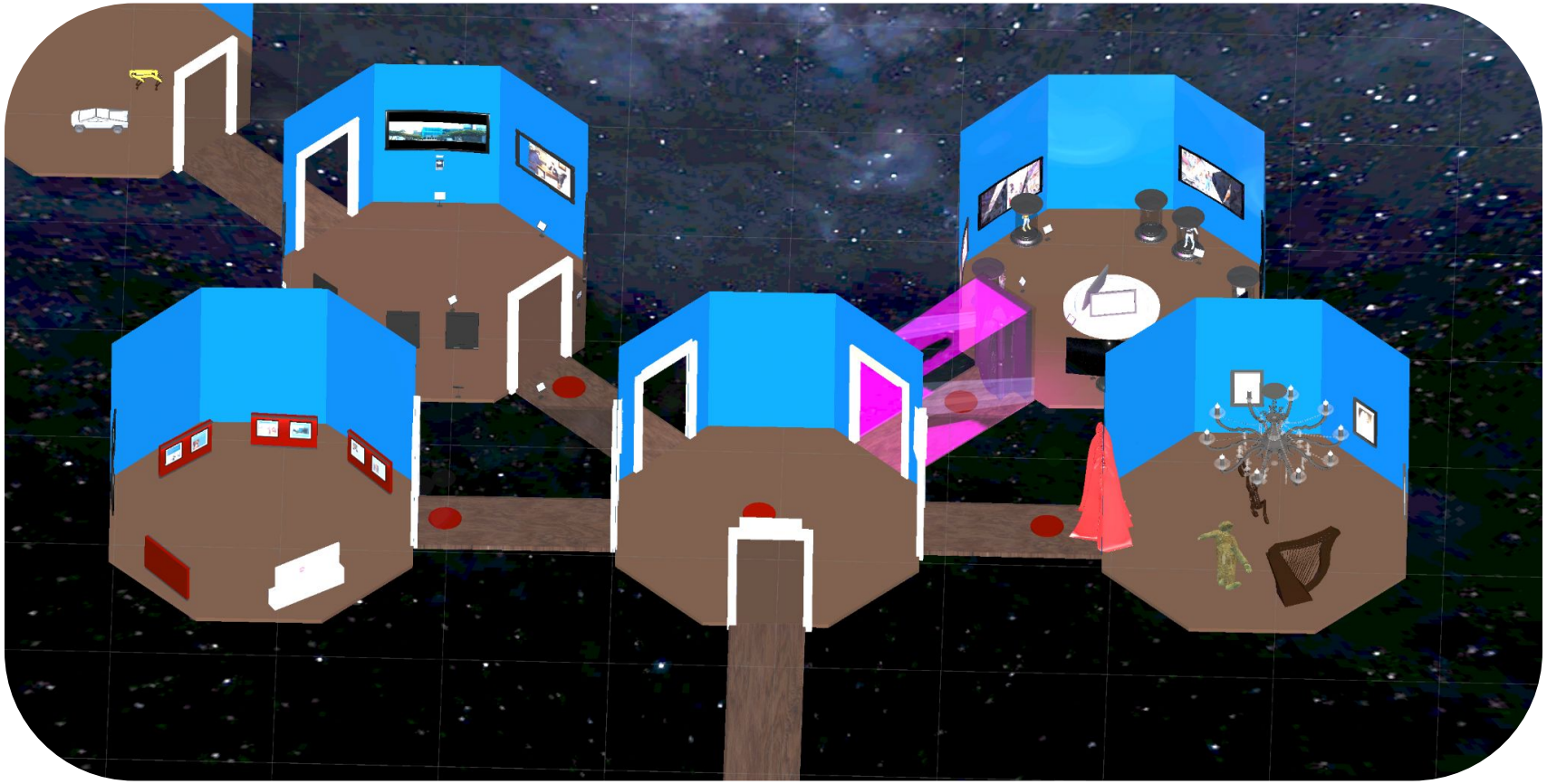
Updates Continued…

NEW HISTORY WING



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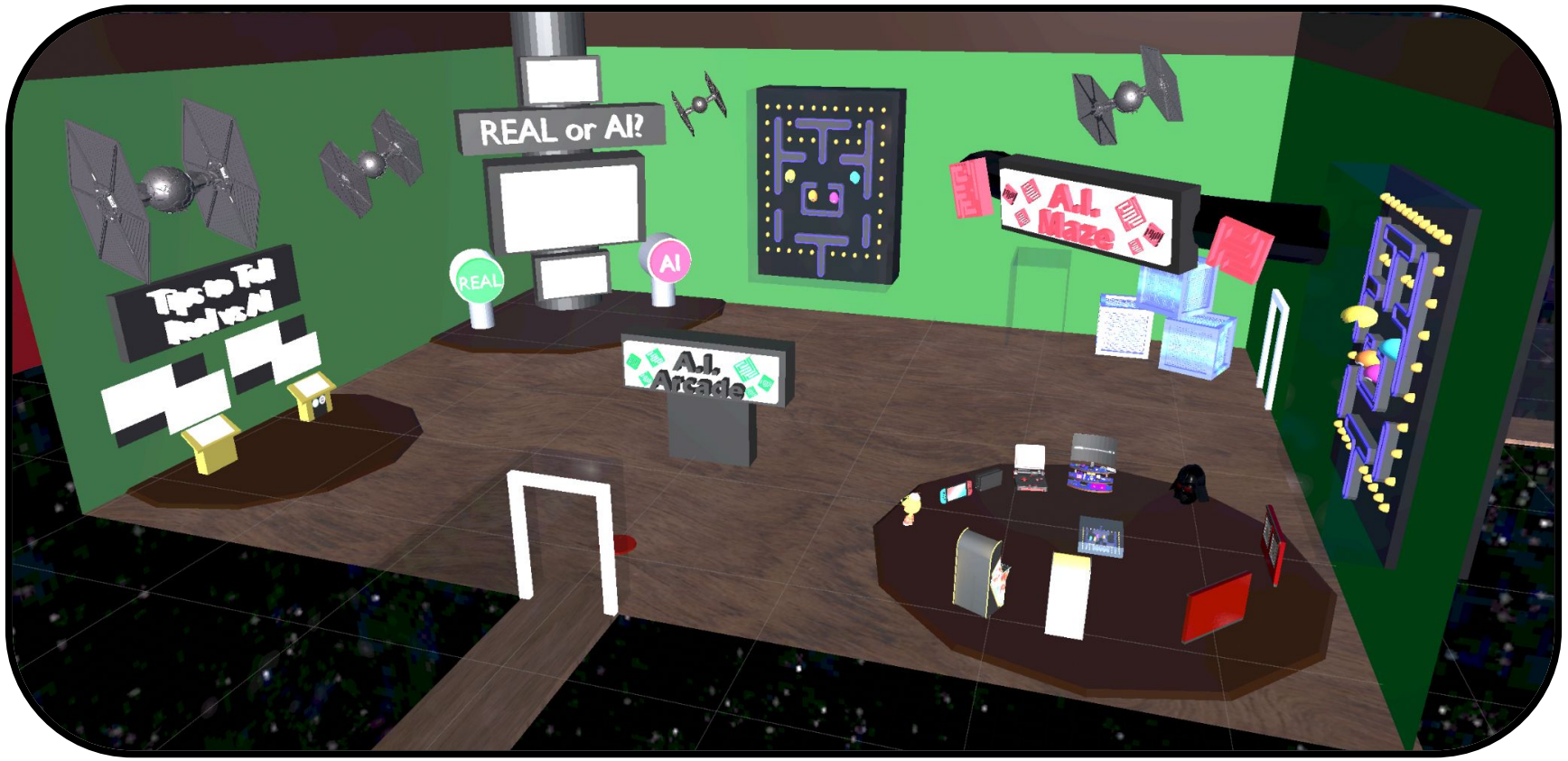
Updates Continued…

NEW GAME WING



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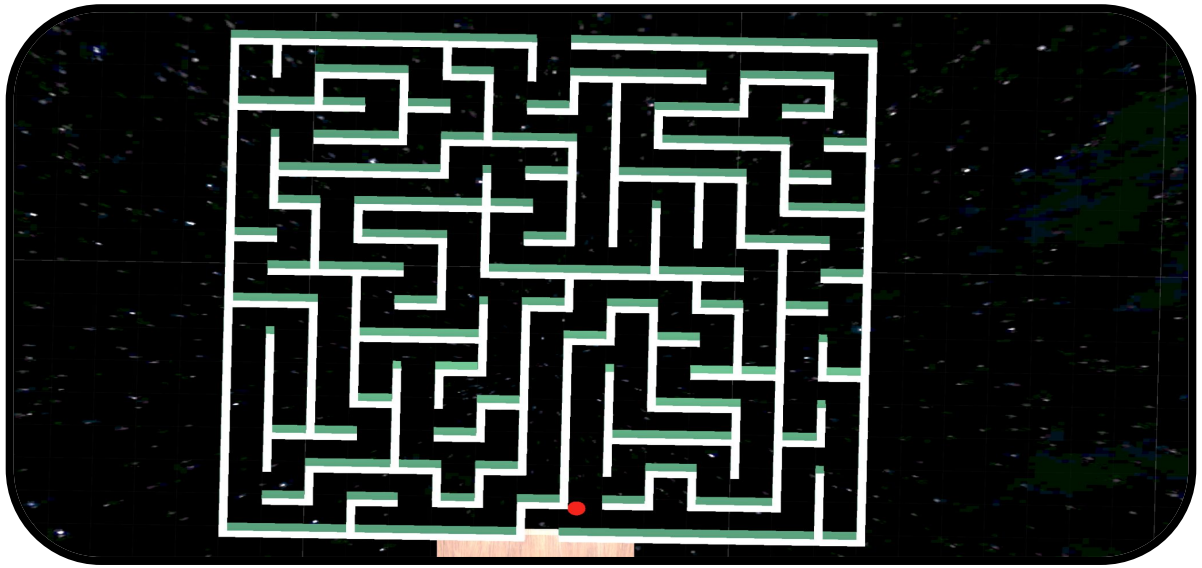
Speaker: Christian Higgs

Generative Maze Room

- 3D maze that generates when the user enters Virtual Reality
- Maze is randomly generated, meaning that the maze will be different every time



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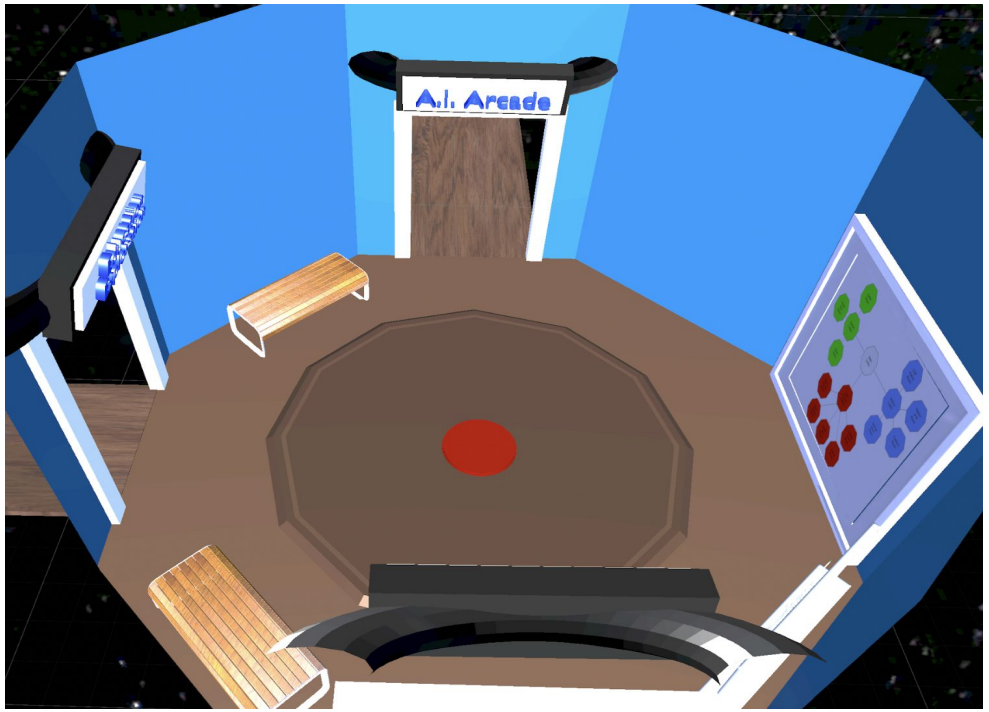
Speaker: Christian Higgs

Fast Travel - Background

- Creating multiple XRigs
  - Initially had one spawn point only
- Assigned spawn points to multiple game objects



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Speaker: Ethan Myers

Fast Travel - Automatic

- Automatic Fast Travel
  - Takes the player to the nearest wing after pressing a button

```
46      int GetClosestSpawnIndex()
47      {
48          if (spawnPoints.Count == 0) return -1;
49
50          float closestDist = Mathf.Infinity;
51          int closestIndex = -1;
52
53          for (int i = 0; i < spawnPoints.Count; i++)
54          {
55              float dist = Vector3.Distance(xrRig.position, spawnPoints[i].position);
56              if (dist < closestDist)
57              {
58                  closestDist = dist;
59                  closestIndex = i;
60              }
61          }
62
63          return closestIndex;
64      }
```

Controls

Left Trigger

- Takes user to nearest spawn point

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Speaker: Ethan Myers

Fast Travel - Menu

- Fast Travel with Drop Down Menu
  - Allows the user to select any room to travel to

```
52    void Update()
53    {
54        float leftTrigger = leftController.activateActionValue.action?.ReadValue<float>() ?? 0f;
55
56        if (!menuActive && leftTrigger > triggerThreshold)
57        {
58            ShowDropdownInFrontOfUser();
59            menuActive = true;
60        }
61
62        if (menuActive)
63        {
64            FollowPlayerView();
65            HandleRightTriggerScroll(leftTrigger);
66            HandleRoomSelection();
67            HandleCancel();
68        }
69    }
```

Controls

Left Trigger
- Call menu

Right Trigger
- Menu Scrolling

Left Grip Button
- Selection

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Fast Travel - Potential Options

- Speech to text fast travel
  - Convert's the user's speech to fast travel commands

- Selective scale fast travel
  - Changes size of the user depending on the exhibit

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Fast Travel Demo

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Progress So Far

- ✓ Game Wing
- ✓ Planetarium Room
- ✓ Gravity Lab
- ✓ Fast Travel
- ✓ Fashion Room
- ✓ Planets sized to scale
- ✓ AI generated music
- ✓ Interactive elements
- ✓ Resolved Clipping Errors
- ✓ African History Room

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Challenges

- Adjusting and moving around 3D models is very tedious
- Problems initially trying to implement generative maze in museum.
  - Problems were resolved within a couple days.
- Implementing interactive elements (such as fast travel) is new to most of the team

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Future Works

- Complete the rest of the rooms in museum
  - AI Arcade Room 70% done
  - History of AI Room 90% done
  - COE History Room 90% done
  - Animal Room 50% done

- Fix texture of floors for the rooms
- Small attention to detail fixes
- Continue to add animations/interactivity

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End of Presentation

Any Questions?

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