MICHIGAN STATE UNIVERSITY

Project Plan Presentation
Cars in the Clear VR Training

The Capstone Experience

Union Pacific

Timothy Alcorn
Antonio Capozzoli
Brayden Goff
Cameron Otten
Vivek Revankar
Will Schmidtfranz

Department of Computer Science and Engineering
Michigan State University

Fall 2025

From Students…
…to Professionals

Project Sponsor Overview

- Union Pacific is a class 1 freight hauling company

- Incorporated under Pacific Railroad Act of 1862

- Develops different virtual reality training software

Project Functional Specifications

- Fouled cars is a common and high-risk occurrence

- Real-world training is problematic

- VR Training eliminates logistical and safety concerns

- Enhances the training experience
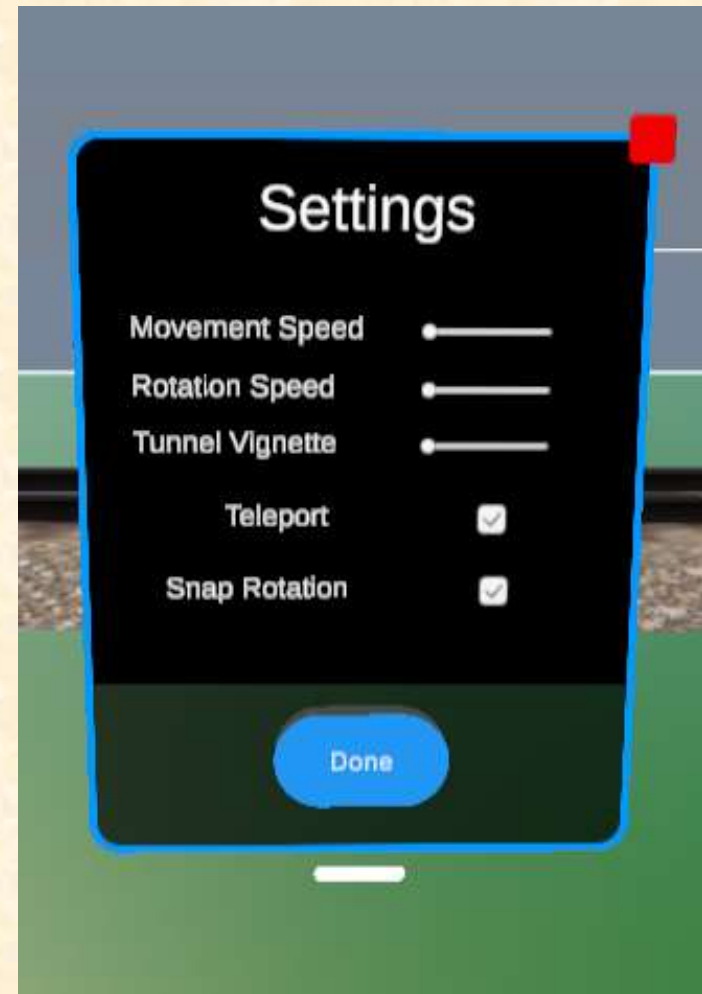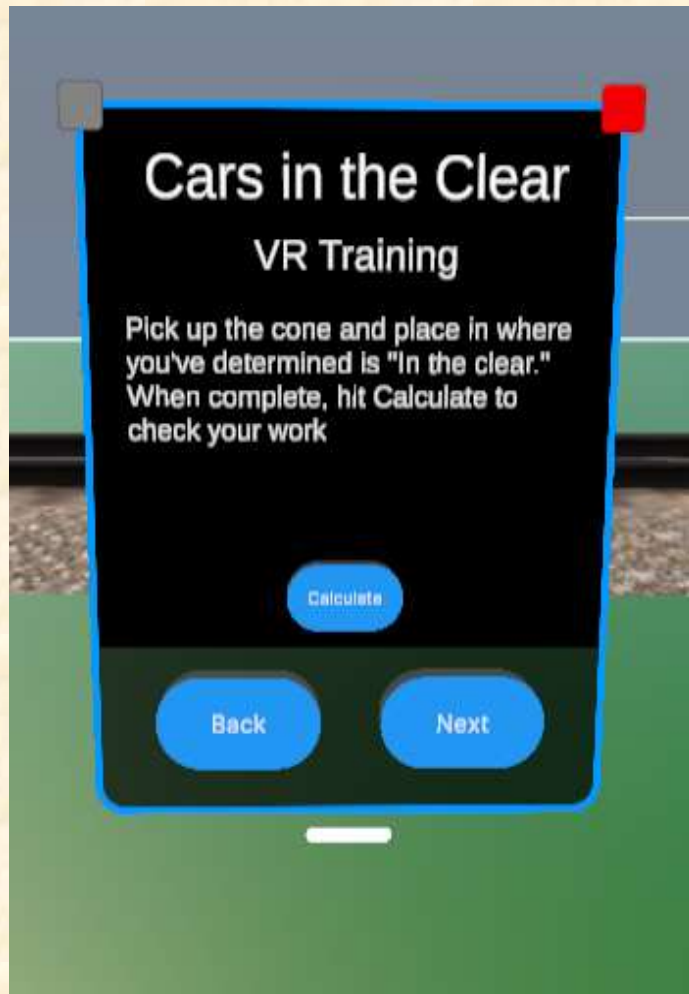
Project Design Specifications

- Simulated railyard environment

- Interactable objects

- Moving railcars

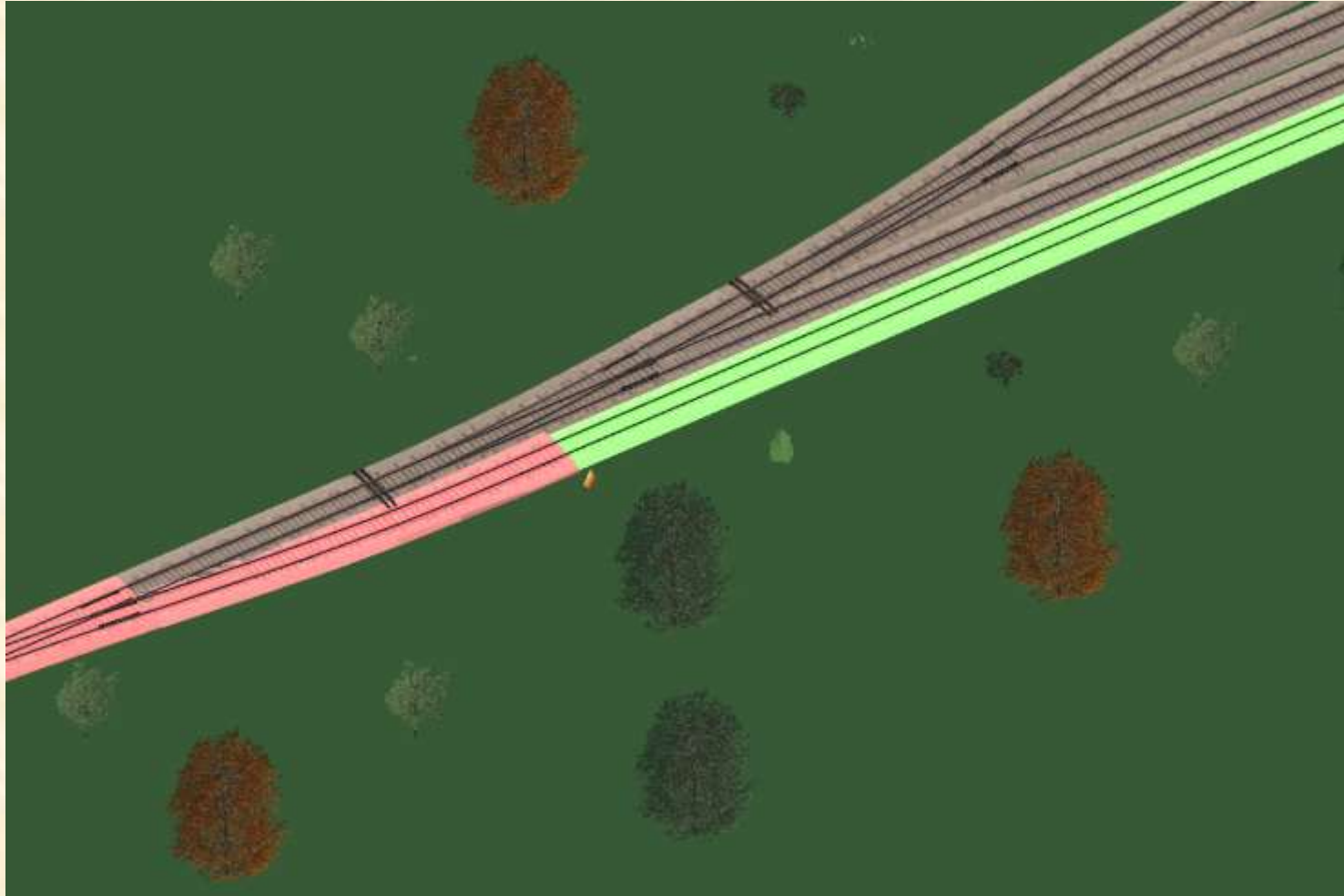- Getting scored

- In-application UI window and buttons
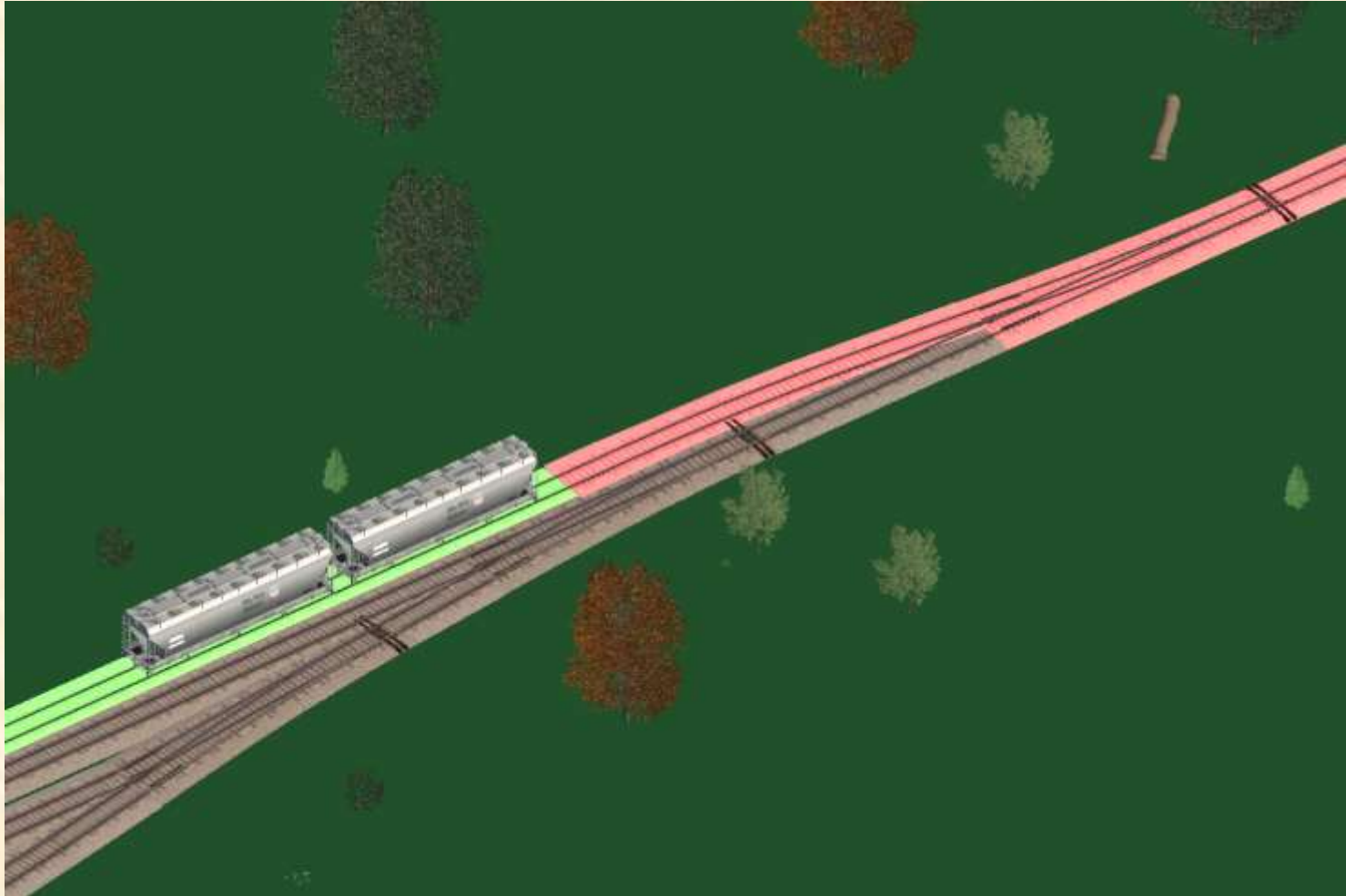
Screen Mockup: Environment

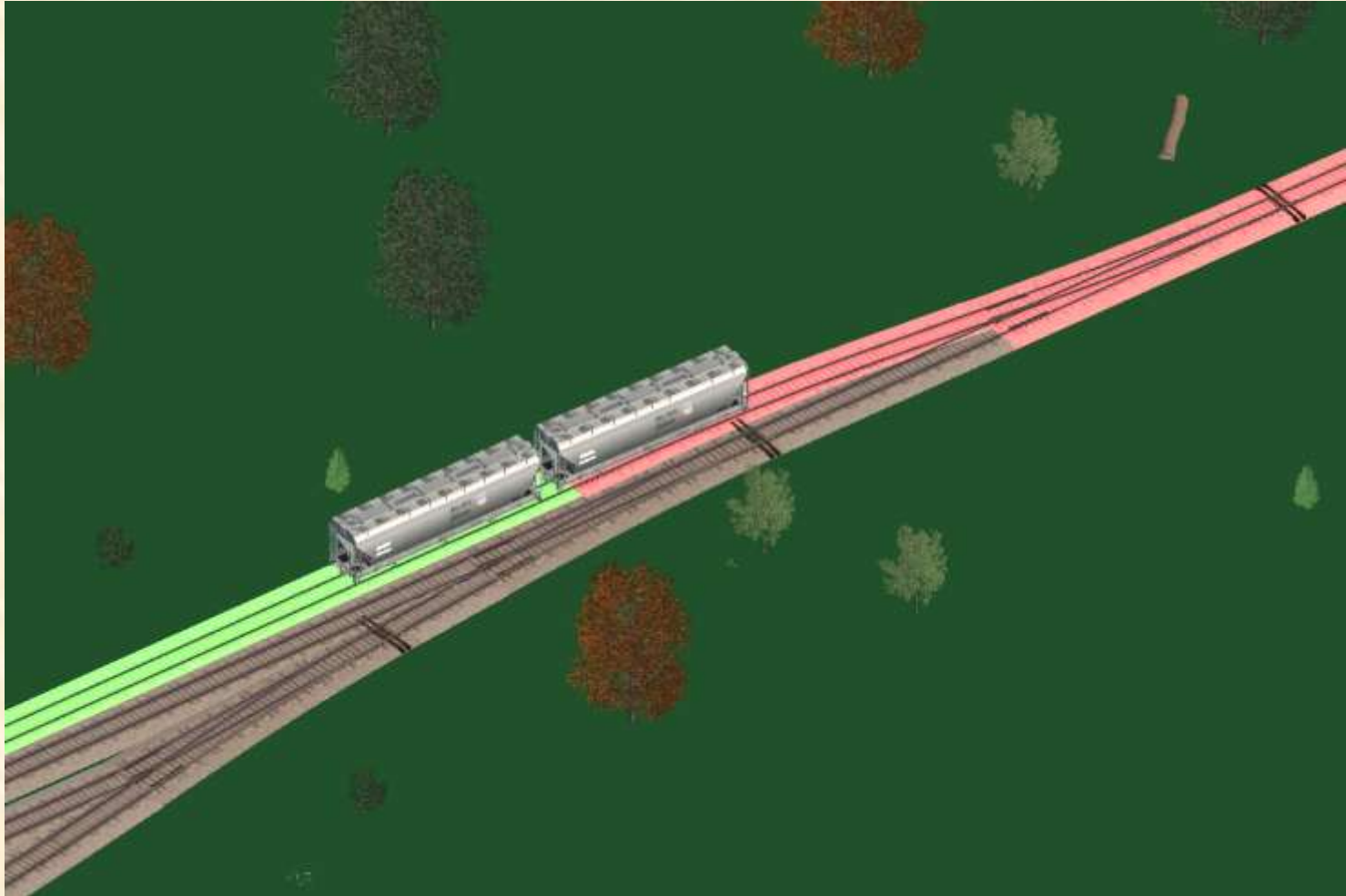# Screen Mockup: UI

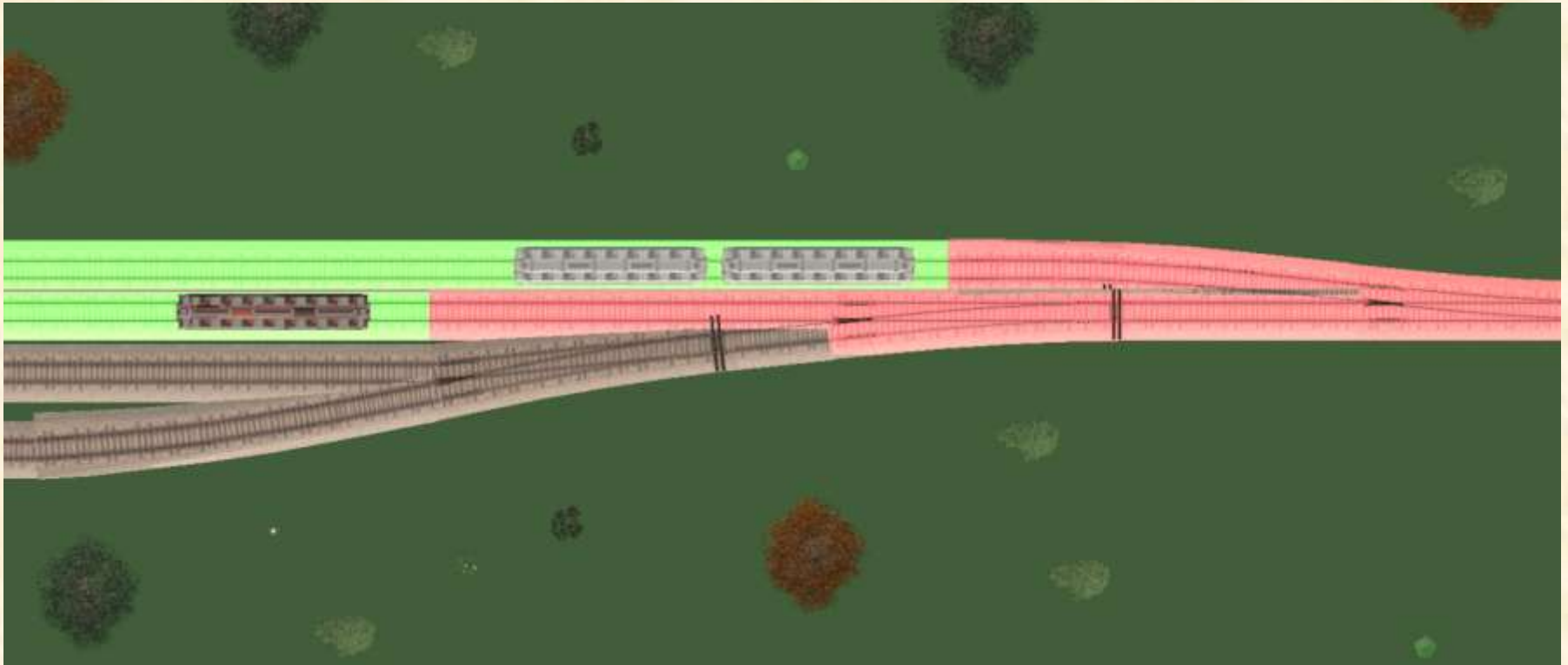# Screen Mockup: Phase 1

Screen Mockup: Phase 2

Screen Mockup: Phase 3

Screen Mockup: Phase 3
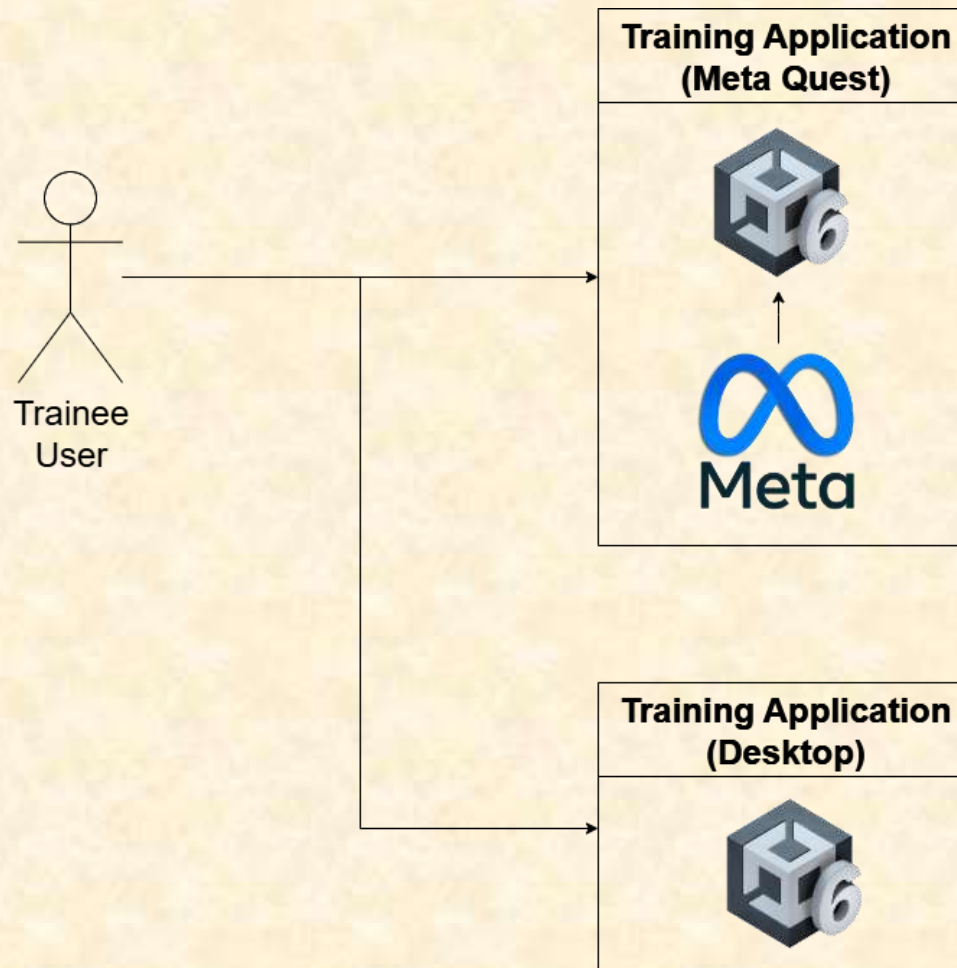
Screen Mockup: Phase 4

Project Technical Specifications

- Built on the Unity game engine

- Written in Microsoft C# on Visual Studio Code

- Utilizing Unity's XR Interaction Toolkit package

- Implementations with Unity's Splines package

- WebGL and desktop support

Project System Architecture

Project System Components

- Hardware Platforms
  - Meta Quest 3

- Software Platforms / Technologies
  - Unity
  - Visual Studio 2022
  - Microsoft C#

Project Risks

- Comfortable VR Experience
  - Take steps to prevent motion sickness
  - Playtest with inexperienced users
- Realistic VR Experience
  - Create an environment that feels like the real situation
  - Look for assets and direction from the sponsor
- Connect Tracks During Procedural Generation
  - Prevent gaps and errors in procedural generation
  - Create a tool that can define rail connection points
- Cross Platform Functionality
  - Create detection for booting into desktop or VR mode
  - Perform additional testing

Questions?

? ? ? ?

? ?

? ?

?