MICHIGAN STATE UNIVERSITY

# Project Plan Presentation

## Shoving Moves

## The Capstone Experience


### Team PS Technology

Mohid Imran
Sairaj Dhullipalla
Joseph Doroan
Abbas Mazhar Hasan
Brendan Mackey
Alexander Thang

Department of Computer Science and Engineering
Michigan State University


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*From Students…*
*…to Professionals*

# Project Sponsor Overview

- Railroad software provider
- Operations, compliance, training tools
- Used by major railroad companies
- Products manage day-to-day operations of more than 100,000 employees

# Project Functional Specifications

- VR training simulator for shoving movements
- Targeted for train conductors in training
- Simulates a realistic environment as compared to a traditional training methods
- About 134,850 railroad employee injuries and 466 fatalities on the job since 1997

# Project Design Specifications

- Virtual Reality Application
- Simulates real railyard environment
- Voice recognition capability
- Prebuilt training scenarios
- Multi-platform integration

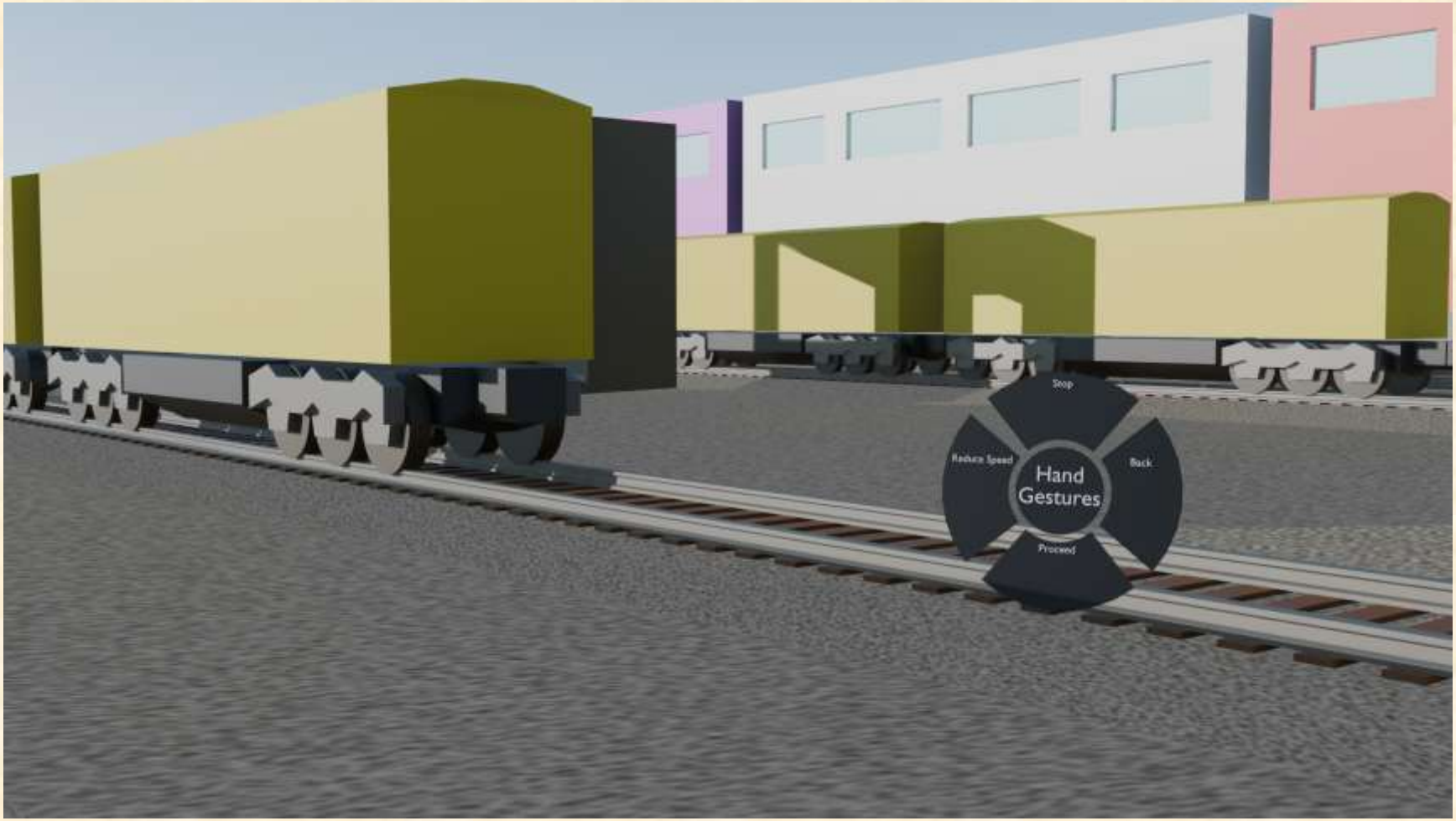
# Screen Mockup: Scenario Selector



# Screen Mockup: Example 1



# Screen Mockup: Example 2



# Screen Mockup: Example 3



# Screen Mockup: Example 4



# Screen Mockup: Example 5



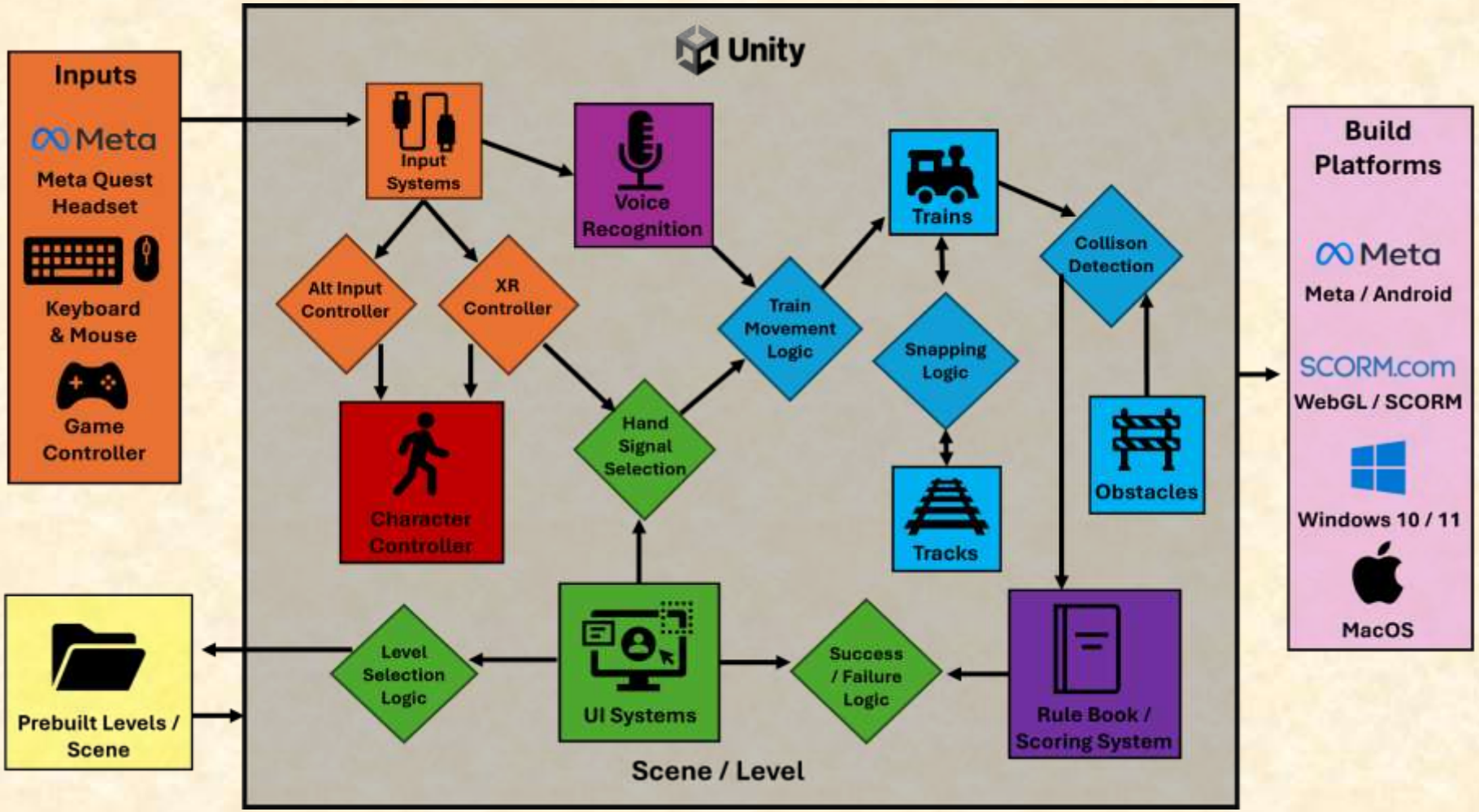
# Screen Mockup: Example 6



# Project Technical Specifications

- Multi-platform training system supporting VR, Desktop, and LMS delivery
- Unity (C#) is the core development engine
- Standalone VR application targeting Meta Quest 3 hardware
- Desktop training application with equivalent functionality to VR version
- On device voice recognition for predefined commands corresponding changes in the environment
- Instructor led evaluation with system assisted monitoring and feedback

# Project System Architecture



# Project System Components

- Hardware Platforms
  - Meta Quest 3 VR headset and controllers.
  - Standard desktop workstation
  - Audio input hardware on meta quest 3 or external.
- Software Platforms / Technologies
  - Unity / C#
  - Meta SDK
  - On-device voice recognition
  - SCORM complaint learning Management System
  - Desktop Operating System (windows/macOS)

# Project Risks

- Risk 1: Handling Voice Recognition
  - Users must be able to speak commands as if they were talking to an engineer
  - Utilize the Meta Voice SDK to process and handle voice commands
- Risk 2: Navigating and Avoiding User Motion Sickness
  - VR programs can make users dizzy
  - Prioritize optimization early to avoid latency, low frame rates, resolution drops
- Risk 3: Designing Realistic and Comprehensive Shoving Scenarios
  - Shoving can be a potentially dangerous process, with many variables
  - Coordinate with client for realistic scenarios
- Risk 4: Multi Platform Integration
  - Uncertainty in converting the VR simulation into a fully functional desktop version and later integrating it with SCORM
  - Design the simulation with platform agnostic architecture early and prototype a basic desktop build alongside VR

# Questions?

