MICHIGAN STATE UNIVERSITY

Project Plan Presentation

Yard Wars: Weathering the Storm

The Capstone Experience

Team Auto-Owners

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From Students…
…to Professionals

Functional Specifications

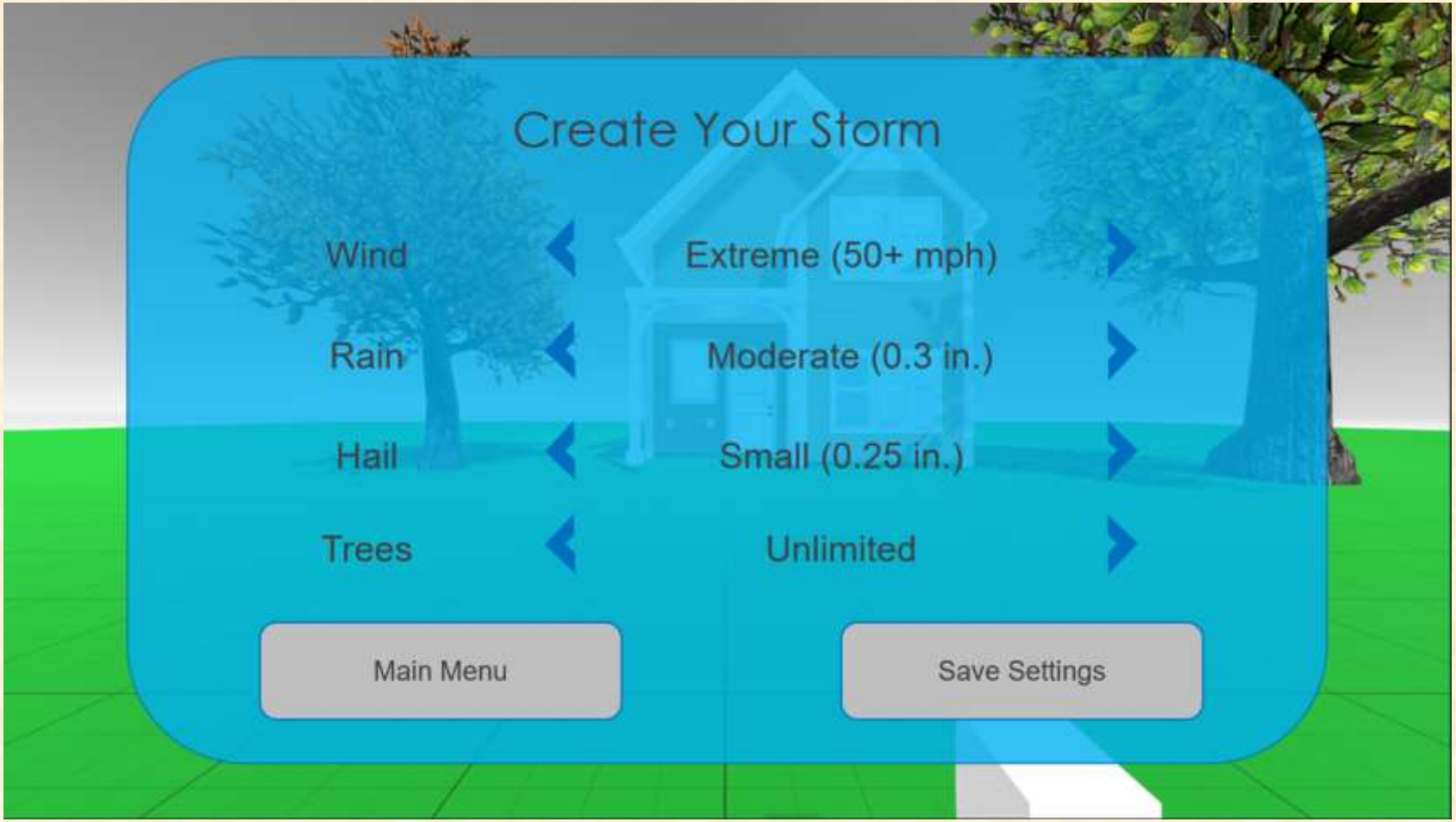
- Storms can cause various amounts of damage to homes and properties
- Trees can help protect or pose greater risk from falling
- Gather data on damage caused or prevented by trees and storms
- Store data in a database and use it for current and future analyses

Design Specifications

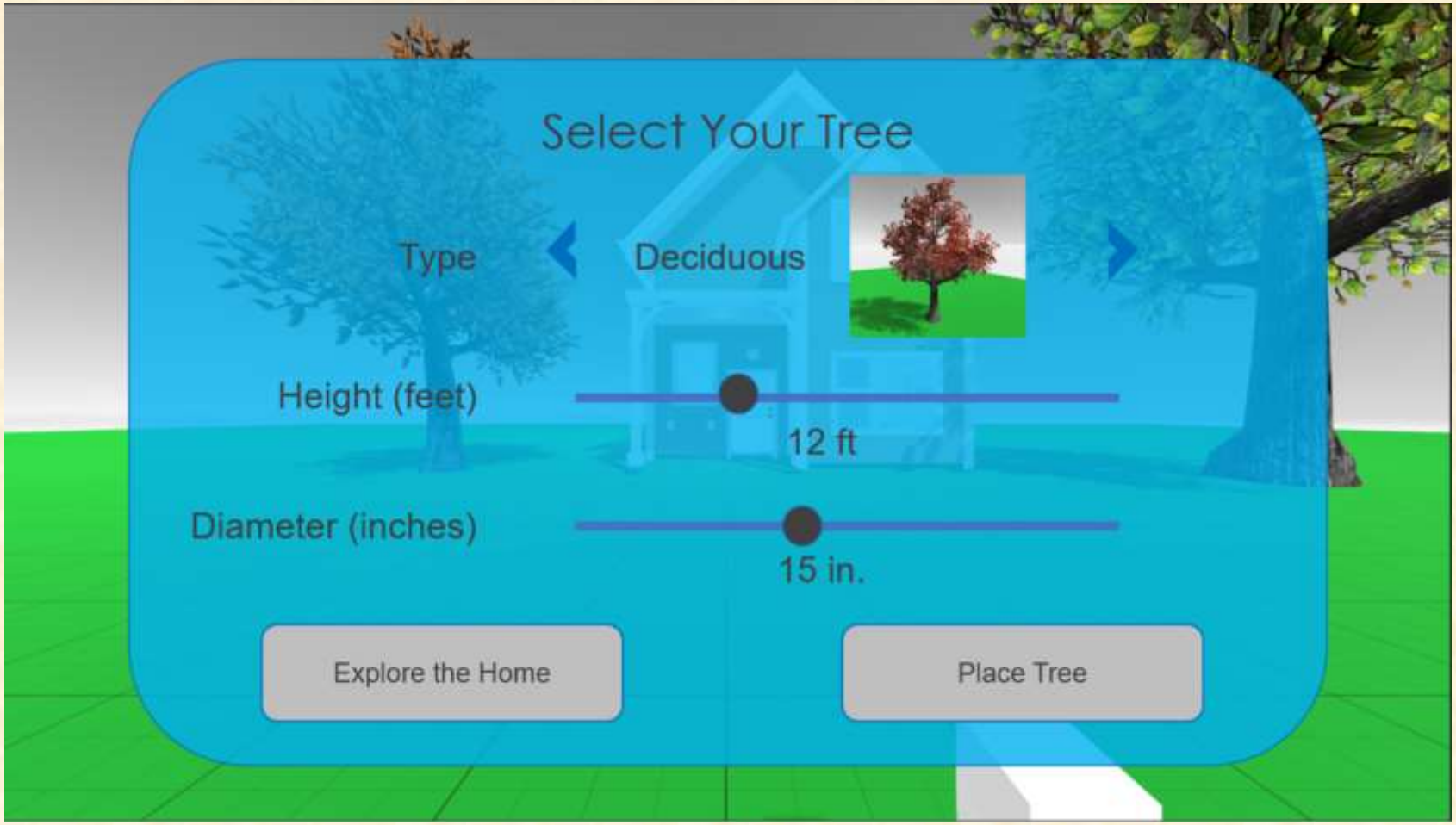
- Virtual Reality Application
  - Place trees
  - Simulate storms
  - Collect data
- Database
  - Receive and store data
- Website
  - Display and organize data

Screen Mockup: VR Main Menu

Screen Mockup: Custom Storm Menu



Screen Mockup: Tree Selection Menu



Screen Mockup: Fallen Tree Information

Screen Mockup: Simulation Data Page

Auto-Owners INSURANCE

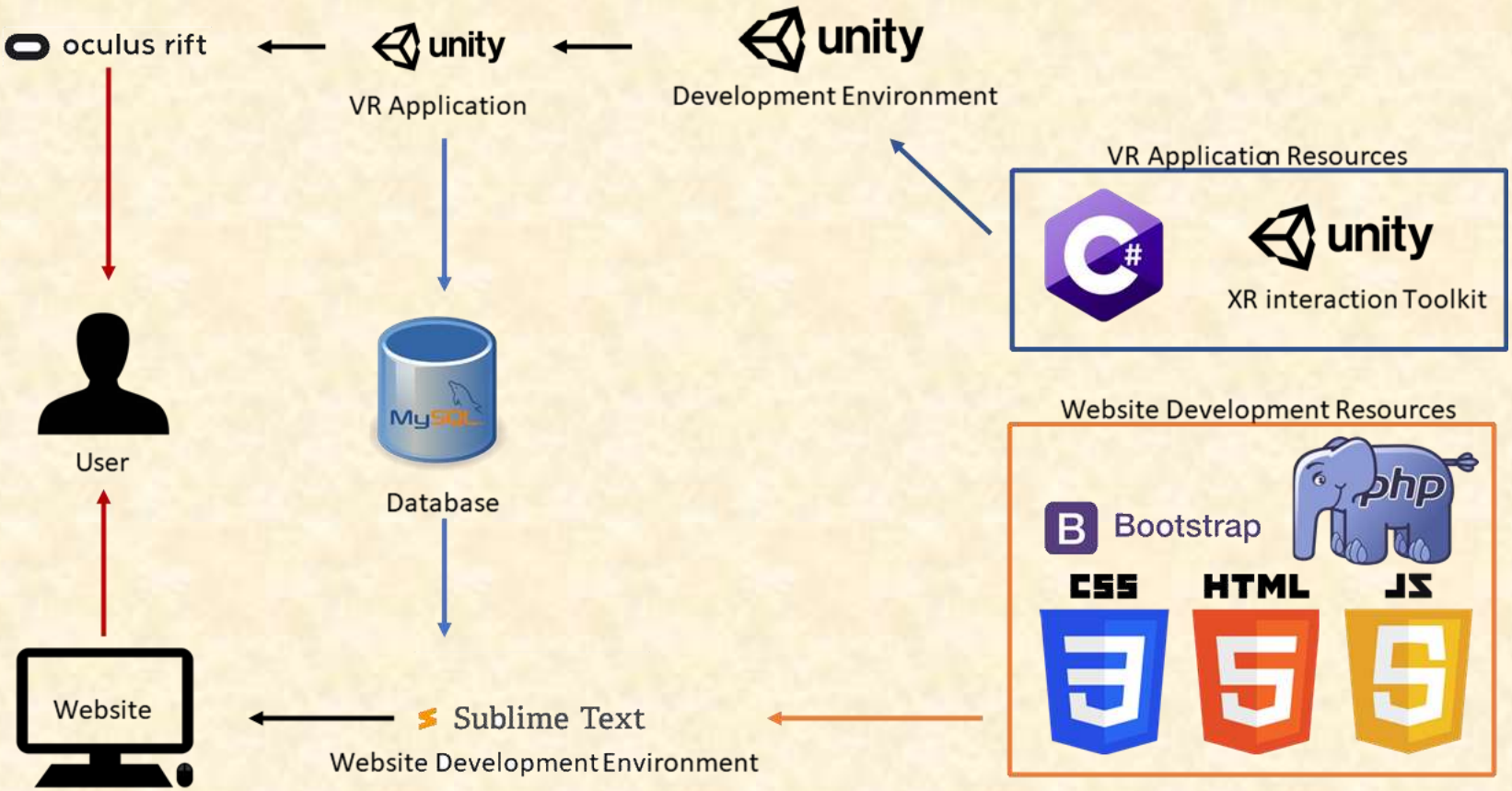
Simulation Data

Simulation Number	Difficulty Level	Rain	Wind Speed	Hail	Number of Trees fell	Fallen Trees Info (TreeID - Damage - Time)
sim-1	Hard	50in	55mph	Small	4	Tree 01 - Low - 2:34 Tree 03 - None - 2:45
sim-2	Easy	15in	7mph	Large	1	Tree 03 - Medium - 4:44
sim-3	Medium	35in	29mph	Large	2	Tree 01 - High - 3:01 Tree 02 - Medium - 3:05
sim-4	Custom	35in	20mph	Small	1	Tree 05 - None - 5:01
sim-5	Custom	5in	3mph	Medium	0	N/A
sim-6	Custom	50in	0mph	Small	0	N/A
sim-7	Custom	25in	29mph	Medium	1	Tree 07 - High - 3:20
sim-8	Custom	60in	45mph	Large	6	Tree 02 - Low - 2:32 Tree 03 - Low - 2:45

Technical Specifications

- Virtual Reality Application
  - Accessed through Oculus Rift headset
  - Developed through Unity, C#, and XR Interaction Toolkit
- Database
  - Developed in MySQL
  - Hosted on MSU Rack Server
- Website
  - Requires authentication
  - Developed in Sublime Text using PHP, Bootstrap, CSS, HTML, and JavaScript
  - Hosted on MSU Rack Server

System Architecture



System Components

- Hardware Platforms
  - Oculus Rift
  - MSU Rack Server
- Software Platforms / Technologies
  - Unity Game Development
  - XR Interaction Toolkit
  - Sublime Text
  - PHP/Bootstrap/CSS/HTML/JavaScript
  - MySQL

Risks

- Game to Database Data Transfer
  - Data needs to be gathered and sent from the VR application to the database
  - Research existing ways to connect Unity to MySQL
- Tree Placement in VR
  - Trees of different types and dimensions need to be able to be placed by users with the Oculus controllers
  - Adopt XR scripts to implement grabbable objects
- Storm Simulation Algorithm
  - An algorithm for various storm types needs to be developed to handle various storm types and interact with the home and trees
  - Research data from real storms and construct equations and models that will be implemented in the simulation
- Inspecting Residence After Simulation
  - Users need to be able to inspect the residence and damages after the simulation
  - Adopt XR scripts for free movement for inspection

Questions?