



# Spring Term Progress Report

EmbarkVR

# Elevator Pitch



# Possible Questions



**Q1: I have worked a  
bit with Virtual  
Reality, what  
technologies did you  
use to build up your  
experience?**

- Technical Answer
- Cover:
  - Hardware
  - Game Engine
  - Packages/Assets

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## **Q2: What was the hardest part about creating the virtual environment?**

- Different for each team member
- Describe hard part, but also turn it positive.
- Examples:
  - Learning Unity so quickly
  - Maintaining one scene with four members working on it
  - Keeping realism

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**Q3: What is next? Is  
Columbia going to  
use your product in  
real stores? Are you  
guys going to keep  
working on it?**

- A little tricky because we don't know the exact answer
  - We hope our project is useful to Columbia
  - Don't try to speak for Columbia/Intel
-

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**Q4: You  
mentioned Smith  
Rock State Park,  
is the scene  
actually  
supposed to be  
Smith Rock?**

- Simple answer first: based on Smith Rock, not exact replica
- Use this question to talk about assets and design choices for realism

**Q5: Is your project an actual game? What can your character do when you put the headset on?**

- Reference demo video
- Two main activities:
  - Fishing
  - Exploring campsite
- Maybe try and stay away from the word “game” in our answers



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# Project Overview

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- Primary components of our virtual reality experience are the terrain and the user interaction.
  - Modeled from Smith Rock State Park in Central Oregon
  - Importance of Immersion
  - Gameflow involves starting in a campsite to allow users to get comfortable in the environment.

# Player Movement



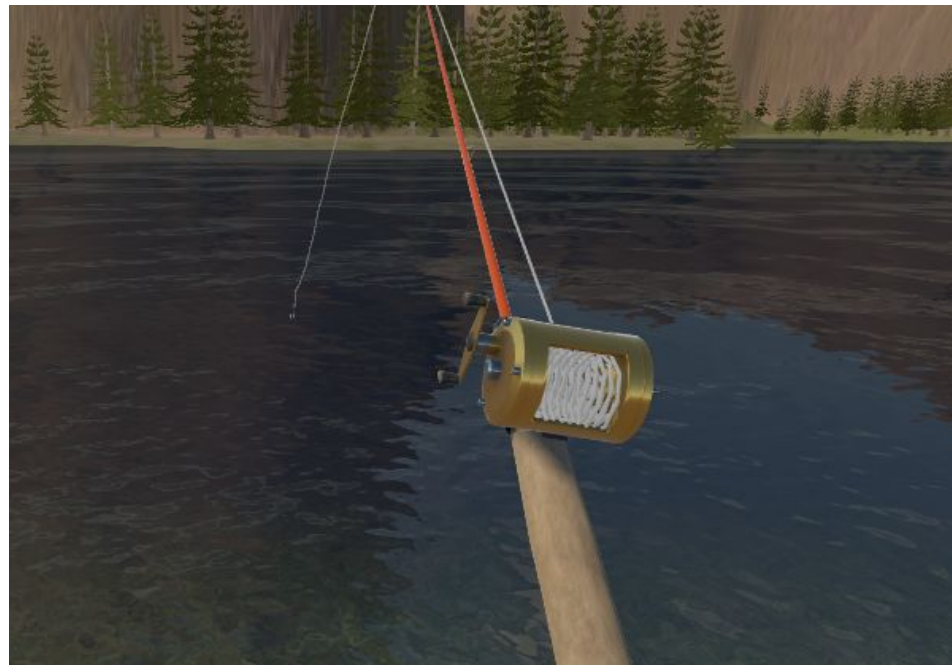
# Campsite



# Columbia Gear



# Fishing Experience



# Requirements



# External Interfaces

- 360 degree view of outdoor scenario within VR experience using HTC Vive headset. This will contain optional user guidance (visual)
- Immersive noises from outdoor VR experience. This includes audio from the optional user guidance
- Ability for other users not using headset to see user's current view.
- Controller available to be held by user to interact within VR experience

# Functional Requirements

- The ability for users to interact with fishing equipment.
- NewtonVR package handles the basic user interaction with rod.
- NVRInteractableItem script allows user to pick up the rod.



# FishingLineLogic Script

- FishingLineLogic script makes use of Ultimate Rope Editor

```
if (NVRPlayer.Instance.LeftHand.IsInteracting)
{
    casting = NVRPlayer.Instance.LeftHand.Inputs[NVRButtons.Touchpad].IsPressed;
    reelHand = true;
}
else if (NVRPlayer.Instance.RightHand.IsInteracting)
{
    casting = NVRPlayer.Instance.RightHand.Inputs[NVRButtons.Touchpad].IsPressed;
    reelHand = false;
}
```

# FishingLineLogic

## Script Continued

- Extension of rope is handled by UltimateRope editor method, ExtendRope

```
if (Rope != null)
{
    m_fRopeExtension = Mathf.Clamp(m_fRopeExtension, 0.0f, Rope.ExtensibleLength);
    Rope.ExtendRope(UltimateRope.ERopeExtensionMode.LinearExtensionIncrement, m_fRopeExtension -
    Rope.m_fCurrentExtension);
}
```

# FishingLineLogic Script Continued

- Fishing Line is reeled in when the user places their thumb on the touchpad of the opposite controller.

```
public static void reelIn(Vector2 axis)
{
    float reelingSpeed;
    if (axis.y > -1 & axis.y < -0.33){
        reelingSpeed = 0.25f;
    }
    else if (axis.y > -0.33 && axis.y < 0.33){
        reelingSpeed = 0.5f;
    }
    else{
        reelingSpeed = 0.75f;
    }
    m_fRopeExtension -= Time.deltaTime *
    reelingSpeed;
}
```

# Fish Logic Script

- The FishLogic script is placed on every fish.

```
if (!caught && userIsFishing && !fishDead && !otherFishCaught)
{
    // If hook is 50 units from fish, fish will begin to follow
    if (Vector3.Distance(hook.transform.position, this.transform.position) < 50)
    {
```

# FishLogic Script Continued

```
else if (direction.magnitude <= 5 && !otherFishCaught)
{
    caught = true;
    this.gameObject.AddComponent<CharacterJoint>();
    CharacterJoint joint = this.GetComponent<CharacterJoint>();
    joint.autoConfigureConnectedAnchor = false;
    joint.connectedAnchor = new Vector3(0, 0, 3f);

    Rigidbody lineEndRigid = lineEnd.GetComponent<Rigidbody>();

    this.transform.position = lineEnd.transform.position;
    joint.connectedBody = hook.GetComponent<Rigidbody>();
}
```

```
NVRPlayer.Instance.LeftHand.TriggerHapticPulse(1500, NVRButtons.Touchpad);
```

# NVRInteractableItem Addition

```
Animation fishAnimation =  
this.GetComponentInChildren<Animation>();  
Rigidbody fishRigid = this.GetComponent<Rigidbody>();  
CharacterJoint fishJoint = this.GetComponent<CharacterJoint>();  
Destroy(fishJoint);  
fishRigid.mass = 5;  
fishRigid.useGravity = true;  
  
fishAnimation.Stop();  
fishLogic.caught = false;  
fishLogic.fishDead = true;
```

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# Performance Requirements



- Must maintain at least 60fps throughout experience.
- Hardware is a limiting factor

# Problems and Solutions





A scenic landscape featuring a calm lake in the foreground, a dense forest of evergreen trees on the right, and majestic snow-capped mountains in the background under a blue sky with scattered clouds. A large, semi-transparent black circle is centered over the image, serving as a backdrop for the text.

# Environment

AQUAS Water  
DirectX11 Grass Shader


# Campsite





# Fishing

A man in a camouflage jacket and cap is fishing in a river. The word "Fishing" is overlaid in large white text. The background features a wide river, grassy banks, and distant mountains under a blue sky with scattered clouds.



How to use the fishing rod:

- 1) Pick up the fishing rod with your dominant hand using trigger.
- 2) Bring rod back over your shoulder.
- 3) While holding down the touch pad, move the rod in a casting motion.
- 4) To reel in the line, hold your thumb on the touch pad of the other controller.  
(Lower on the pad is slower, higher is faster)

# User Interface

# Looking Forward

- Expand to include other outdoor activities
- Further promote Columbia gear within the experience