

Introduction to Virtual Reality

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Overview

- Intro and Background
- Immersive Reality Technology
 - VR vs AR vs MR vs XR
 - Immersive technology as a tool
 - Use cases
- Spaces and Events
 - On campus technology
- Hardware Overview
 - Inventory
 - General use
- Questions & Demos



Background

- Who am I?
- What is VR/AR/MR/XR?
 - “VR” – Virtual Reality
 - “AR” – Augmented Reality
 - “MR” – Mixed Reality
 - “XR” – Cross Reality
- Virtual and Augmented Reality Initiative (VRI)
 - Vice President for Research, Alan Rudolph
 - Promotion and outreach to faculty and students
 - VR/AR/MR/XR technologies on campus
 - RamReality

RamReality - Immersive Reality Events

What is RamReality?

- Virtual Reality Class Series
- Virtual and Augmented Reality Symposium
 - October 19, 2018, LSC Ballroom D
- Virtual and Augmented Reality Create-a-thon
 - Formerly VR/AR Hackathon
 - October 19-21, Morgan Library Event Hall
- Create-a-thon Showcase
 - October 22, Morgan Library

Immersive Reality Technologies

- Not a new technology
- Age of technology → Accessibility, Cost
- VR vs AR vs MR vs XR
 - Digital interaction → Immersion
 - VR – digital objects in a virtual world, head mounted displays (HMD)
 - AR – data or CG elements overlaid in the real world
 - MR – digital objects and data interacting with the real world
 - XR – virtual worlds and objects in real and virtual environments, umbrella term
 - Don't get caught up in semantics!

Immersive technology as a tool

Hardware makers follow the money

- Consumer driven market
 - Video games
- Technology advances make work easier
 - Specialized content creation



Use cases on campus:

- CSU Immersive Experience
 - Storytelling and promotion in virtual reality
- B Sharp, Deana Davalos
 - Fort Collins Symphony in virtual reality for people with dementia
- Virtual Anatomy, Tod Clapp
 - Teaching and data visualization for medical data within a virtual collaborative environment

Virtual Reality

- Head mounted display (HMD)
 - “goggles”
- Tracking
 - Room tracking (6 Degrees of freedom)
 - More freedom and motion
 - More expensive
 - Non room tracking (3 Degrees of freedom)
 - Easy to use, portable
 - Less motion
- Interface
 - Most include a controller

How do they work?

- Computer rendered objects in stereoscopic
 - One display, two lenses
 - Processing power and display resolution
 - Computer connected or standalone
- Sensors to track motion
 - Internal or external
 - Different for each headset



Augmented Reality/Mixed Reality



- See the real world augmented with digital objects or information
- Range of different implementations
 - Mobile
 - HMDs
 - Heads-up displays
- Examples
 - Apps
 - HoloLens
 - Google Glass



On-Campus Spaces

- VR Lab
 - Open lab hours with equipment and computers
 - Johnson Hall 120A
 - T,R,F 10AM-Noon (Subject to change)
- Richardson Design Center
 - Mixed reality space for design visualization
 - Opening January 2019
- Health Education Outreach Center
 - 100-150 seat collaborative VR space, virtual anatomy lab
 - Opening December 2018

Hardware

- VR equipment
 - HTC Vive
 - Room tracking using “lighthouses” with two hand controllers
 - Oculus Rift
 - Room tracking using sensors with two hand controllers
 - Samsung Odyssey
 - Room tracking using outward facing cameras with two hand controllers
 - Oculus Go
 - Portable non room tracking with single controller



Hardware

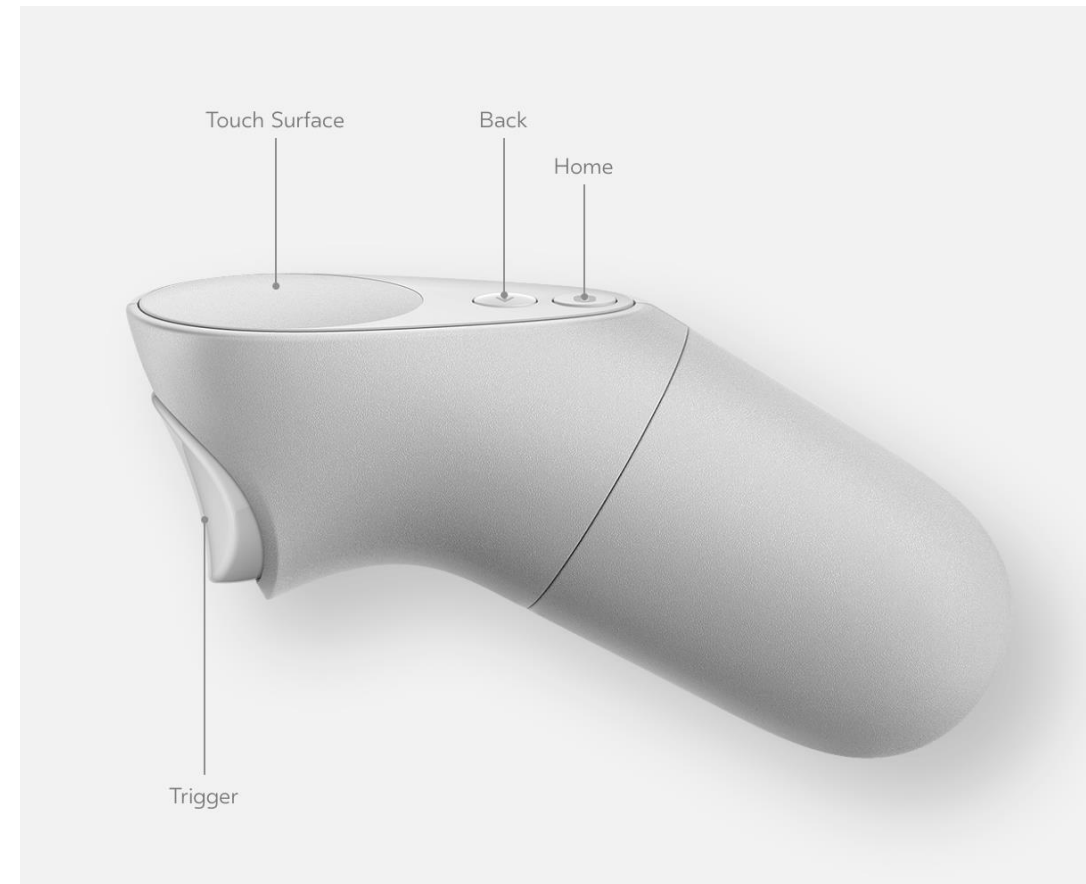
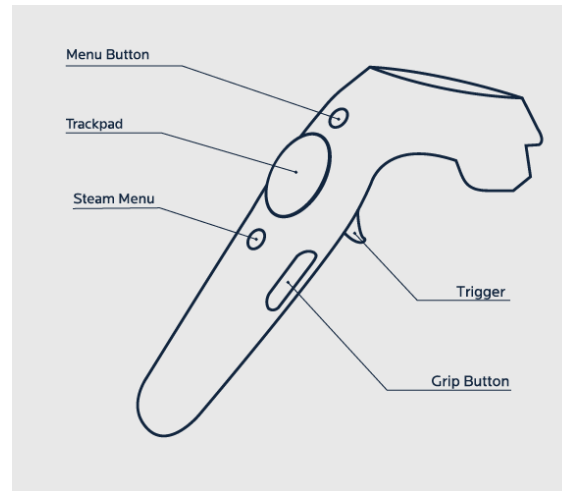


- Augmented reality
 - Microsoft HoloLens
- Other hardware
 - Virtuix Omni
 - Omnidirectional treadmill
 - Leap Motion
 - Hand tracking camera
 - Samsung Gear 360
 - All-around videos and pictures
 - VR ready computers

Using the hardware

Generally, most VR hardware is the similar

- Hand controllers
 - Trigger button
 - Track pad
 - Menu/back button



Questions and Demo

Any questions not answered today can be answered:

- Visit our website: www.research.colostate.edu/ramreality/
- Email: vpr_virtual_reality@mail.colostate.edu

RamReality - Immersive Reality Events

Virtual Reality Class Series

- Intro to Virtual Reality
 - Library Event Hall
 - August 30, 4-5PM
 - September 4, 4-5PM
- Getting Started with WebVR, with BluePenguin
 - Library Computer Classroom 171
 - September 13, 4-5PM
- Unity Game Engine for Virtual Reality
 - Library Computer Classroom 171
 - September 18, 4-5PM
 - September 27, 4-5PM
 - Please bring a laptop with Unity installed!
- Storytelling in VR
 - Library Event Hall
 - October 9, 4-5PM

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