VIRTUAL REALITY @ BERKELEY

PROJECT ROSTER
SPRING 2016

Augmented Reality Interfaces for Drone Control

FALL & SPRING

Explore and envision new ways for human users to intuitively interface and collaborate with aerial drones around augmented reality (AR) technologies.

TEAM LEAD

Kevin Yin

ABOUT THE PROJECT

Our project will be exploring how AR-Drone Interfaces should be built on the Hololens as well as building the infrastructure to integrate autonomous drones with our own HUD device.

Project Goals

- Learn, explore, and test the Hololens SDK
- Design an intuitive AR interface for drone pilots
- Integrate autonomous drones with our own HUD solution through the Vicon

DJI PHANTOM

TEAM ROLES

Designer
You love thinking about what makes an intuitive interface and great user Experience with Unity. Experience with designing and building UI/UX. Great communication skills and ability to work in a team

Developer
You love solving about complex problems by building simple solutions. Ability to pick up new programming languages. Experience working with SDKs. Ability to integrate multiple frameworks. Great communication skills and ability to work in a team

Berkeley Immersive Augmented Reality Glasses

FALL & SPRING

Unreal Interface (UI)

TEAM LEAD

Will Huang

ABOUT THE PROJECT

This project is an open-ended research project with a goal to create a flexible and customizable system that can enable human computer interaction in 3D space on any AR platform. It integrates depth sensors, EEG device, and transparent display glasses in a head-mounted platform to prototype the collection and display of information within a virtual or augmented reality system. Think of it as recreated Iron Man.

TRANSPARENT DISPLAY GLASSES

TEAM ROLES

- Improving existing depth map based finger tracking solution
- Build and publish open source SDK for augmented reality interaction
- Integrate Brain Computer Interface assisting interaction with holograms

EEG Researcher
Integration of Emotiv Epoc+ with current system. Pattern Recognition / Machine Learning. Ideal Skills: C++, Machine Learning, EEG

Algorithms Researcher
Reconstruction of real environments in virtual world. Image processing with depth and RGB images. Qualification: C++

UX Designer

AR Applications in Medicine

FALL & SPRING

Capturing, streaming and rendering data in an AR context

TEAM LEAD

Hansen Ling

ABOUT THE PROJECT

My team is working with the Berkeley Augmented Telemedicine group. We're building a system to assist medical field workers such as paramedics to be able to communicate with medical professionals in a accurate, intuitive manner using augmented reality. We will be working on rendering dynamic point cloud data using a Z Space and possibly on streaming and capturing this data. This involves concepts in computer graphics and computer vision.

Medical VR Concept Art

TEAM ROLES

Members of the team will work on taking in streamed point cloud data and generating the appropriate mesh in C++, then rendering it in Unity. Members will also work on implementing input to the Z Space and displaying this input accurately as the mesh deforms.

UI/UX Designers
Explore a new field by creating UI for virtual reality platforms. Previous design experience highly preferred.

OpenGL Developer
Work on rendering MRI data and the challenges of being able to efficiently view data using OpenGL. Put your graphics and linear algebra knowledge to use!

Virtual Campanile

SPRING

Immerse yourself in the guardian and landmark of UC Berkeley.

TEAM LEAD

Yulin Zheng

ABOUT THE PROJECT

The Campanile, located at the center of UC Berkeley campus, is an ivory tower with an observation deck and a grand carillon at the top. Ever since it was built, the Campanile has been the guardian and landmark of the university. The intent of the Virtual Campanile project is to reveal the tower's historical significance in addition to provide people a chance to experience the carillon. This grand musical instrument can be easily played in virtual reality but is not usually accessible on campus. exploration of the Campanile, and integrate a pair of controllers for users.

SATHER TOWER
(REAL REALITY)

TEAM ROLES

3D Artist
Given legit reference images, create 3D models for the Campanile and the carillon.

Shader Writer
Given the aesthetics of the project, write surface, vertex and fragment shaders for Unity.

Sound Engineer
Given an audio recording, extract and sample the sound of 61 carillon bells.

Landships

SPRING

Explore the potential of multiplayer game development for VR

TEAM LEAD

Charles Niu

ABOUT THE PROJECT

Users of VR headsets like the Oculus often report a feeling of disorientation when their characters move around in 3D space, since in real life their bodies stay rooted to their chairs. As a result, games such as “EVE Valkyrie,” where the player is simulated as being seated within the cockpit of a spaceship, are orders of magnitude more compelling. Instead of space-ships, we’re going to be doing land-ships - namely, tanks. Handling a tank is more than a one-person job however. Landships! will be a multiplayer experience where players take on the various roles of a tank crew. One driver, one shooter, one loader, one spotter, each depending upon one another to function. Can VR deliver an immersive enough experience to simulate this kind of cooperative play?

LANDSHIPS!

TEAM ROLES

We are welcoming to all skill levels. The most important quality is an intense willingness to get the project done as it will require time and eye strain. Experience with developing in Unity, or experience with 3D modeling using Maya would be preferred.

Game Designers

Programmers

3D modelers/animators

2D Texture Artist

VR Animation

FALL & SPRING

Create, design and animate a short clip that will be take advantage of the full scope of virtual reality's capabilities for interaction!

TEAM LEAD

Isabel Zhang

ABOUT THE PROJECT

The VR Animation team is working on creating an animated short that allows an audience to discover videos and films in a completely different medium than what people are accustomed to. Never before have people been able to experience such intimacy with the characters in a film. Akin to Oculus's Henry, this team plans to make a short clip (1-5 minutes) that explores story-telling in a three dimensional space.

DEMOS AT CAL DAY

TEAM ROLES

Unity Developers
Want to get involved in the virtual reality field or learn how to work the Unity game engine? Get plugged in building demos that let other people experience VR.

3D Artists
Know how to create 3D content with Maya, Blender, or the like and want to learn how to apply those skills to VR content creation? Join this team to learn about how to bring 3D content to life with VR.

Designers
Apply your design skills in a field where good design choices can lead to awe-inspiring experiences and poor design choices have serious physiological consequences!

Augmented Textbooks w/ Cardboard

FALL & SPRING

Cardboard in Education

TEAM LEAD

Tom Cheng

ABOUT THE PROJECT

Have you ever watched a sci-fi program and were amazed by the holograms coming out of books? Our project focuses on implementing marker tracking and turning that marker into 3D objects in an AR space. This concept has numerous applications in education. Imagine being able to see and rotate a molecule in 3D.

Team LEAD

Rohan Murthy

TEAM ROLES

Unity Developer
OpenCV experience highly preferred. High aptitude for integrating different SDK's

3D Artists
Know how to create 3D content with Maya, Blender, or the like and want to learn how to apply those skills to VR content creation? Join this team to learn about how to bring 3D content to

Designers
Apply your design skills in a field where good design choices can lead to awe-inspiring experiences and poor design choices have serious physiological consequences!

Cardboard Platform Extensions

FALL & SPRING

Try to add things like positional tracking and gestures to the world's most accessible VR platform.

TEAM LEAD

Daniel Pok

ABOUT THE PROJECT

Google Cardboard is by far the easiest way for people to try VR; anyone with a smartphone can experience basic VR content with just a few dollars worth of cardboard and lenses. It can track head rotations and render 3D content, but it lacks features like positional tracking and input devices that higher end VR/AR devices like the Rift, Vive, and Hololens have. This project will attempt to apply what we know about artificial intelligence, machine learning, computer vision, and electrial engineering to push the limits of what we can do with VR and AR on consumer mobile devices. This project will be exploratory and involve independent research and is best suited for more advanced candidates who have taken upper division courses and are comfortable trying ideas that may ultimately fail for the sake of fun and learning. The team is initially looking at new and old methods of implementing positional tracking and gesture, augmented reality camera passthrough, and user input.

Google Cardboard

TEAM ROLES

Research Member
Members will collaboratively come up with ideas and rapidly prototype them.

Immersive Storytelling for Kids

FALL & SPRING

Empower kids around the world to share their experiences in VR with Cardboard.

TEAM LEAD

Jason Sellers

ABOUT THE PROJECT

Past work under Professor Glynda Hull has explored the role of digital literacy in relation to issues of identity and cultural understanding. You can read more about their published research here: http://www.hullresearchgroup.info. They are presently conducting reserach on mentoring relationships between Berkeley undergraduates and middle-school-aged students at school sites in the East Bay, as they work alongside one another to create and share impactful digital stories. \n\r This semester, we are interested in exploring VR experiences in educational settings and their relationship to empathy. We are looking at Google Cardboard as a potential low-cost platform that would allow students in several locations around the world to create and share VR experiences. We are looking for students who have an interest in education and are excited about exploring the educational applications of VR with us.

Oculus Rift

TEAM ROLES

Experience Developer
Help develop the prototypes in Unity and the infrastructure to save, share, and replay captured experiences.

Experience Designer
Help research user needs and test prototypes while interacting with students and educators to refine the experience.

Simultaneous Location and Mapping of Drones

FALL & SPRING

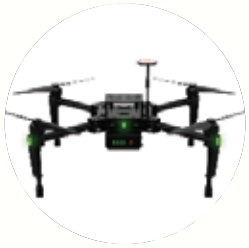
Design and build VR experiences for a Halloween demo day using immersive headsets and gesture controllers.

TEAM LEAD

Apurv Gandhi

ABOUT THE PROJECT

We envision an urban search-and-rescue workflow. In the situation of an urban disaster such as fire or earthquake, rescuers would like to rely on a fleet of quadcopters to survey building exterior stability and interior conditions. Through this project, you will gain exposure to flying drones, programming drone components, analyzing real time image data, and developing a potentially groundbreaking solution to the search-and-rescue problem. Through an AR-based drone interface, drone operators will be able to visualize immersive 3D structural views collected from the drones and also the augmented drone operational information such as their flight plans and designated safe regions.



Drone

TEAM ROLES

Software Developer - Computer Vision
We will be processing multiple images and combining them to create a 3D model of our surroundings. The more experience the better, but the only requirement is the ability to learn fast, and proficiency in Java or C as well as familiarity with Unix systems.

Software Developer – Java or C