Project Description

UNL School of Computing – Husker STEM VR

Project Overview

This project will expand on the current Husker STEM VR app. The Husker STEM VR project is an outreach/recruitment app built for the Oculus Quest, iOS, Android, and Web App. Students built this virtual reality app for UNL's School of Computing and College of Engineering to encourage STEM outreach. This app began to help to make learning fun by creating a virtual reality app designed to create an engaging learning environment. Now that VR app has been extended to include multiple mobile platforms to increase distribution even further. Additionally, we can promote more diversity in STEM by creating an educational environment that promotes inclusiveness.

The second year students were able to successfully extend the app to iOS and Android mobile apps. They were also able to add in information and educational activities/capabilities for prospective students to explore other STEM degrees within the College of Engineering.

Sponsor Background

Jeff Falkinburg is an Assistant Professor of Practice in the School of Computing at the University of Nebraska-Lincoln, a Computer Engineer, and retired U.S Air Force Major. My research interests include robotics, embedded systems, 3D modeling, and simulation design. My areas of specialization include VLSI Systems, Computer Architecture, Embedded Systems, Advanced Digital Design. I have been teaching in the School of Computing for seven years and have taught classes like CSCE 10 – Intro to SoC, Computer Organization, Embedded Systems, and Advanced Embedded Systems.

Project Stakeholders

This application will be used for engineering outreach throughout UNL and around the world.

- *Jeffrey Falkinburg, Assistant Professor of Practice, Principal Investigator and Primary Contact*
- *SoC Advising Department*
- *CoE Student Services Staff*
- *Other UNL Engineering Students*

Current System Overview

The Husker STEM VR project is an outreach/recruitment app built for the Oculus Quest, iOS, Android, and Web App. Students built this virtual reality app for UNL's School of Computing and College of Engineering to encourage STEM outreach. This app began to help to make learning fun by creating a virtual reality app designed to create an engaging learning environment. Now that VR app has been extended to include multiple mobile platforms to increase distribution even further. Additionally, we can promote more diversity in STEM by creating an educational environment that promotes inclusiveness.

Figure 1: Husker STEM VR App Overview

Find more information on the Husker STEM VR app at https://www.huskerstemvr.com/.

Proposed System/Scope

In the following four subsections, we will provide the project vision.

1. Business Justification

This app will be updated for all platforms and will be updated to work an Meta Quest 3 app that will be used to help with recruitment in the School of Computing and College of Engineering at UNL by providing a fun and engaging way to learn about STEM and about the Huskers in virtual reality environment.

2. Proposed System Overview and Strategy

The final solution we wish to attain is a STEM outreach focused game that implements various fun engineering type activities/research accomplished here at UNL in the CoE. This app will be updated to expand on the current app. It will first be updated with new builds on the Android mobile platform and then then be updated to support Meta Quest 3. Additionally, we will create a 3D walkthrough of the new Kiewit Hall as well as create more challenging escape room type activities for other degrees within the CoE

3. Scope of Work

The team is tasked to update the Husker STEM VR app on all platforms and be updated to support the Meta Quest 3.

1. *Update the current Android mobile app to support Android 16 devices on the Google Play store.*
2. *Update the current iOS mobile app to support iOS 18.6 devices on the Apple store.*
3. *Upgrade the current VR app to work on Meta Quest 3 Devices.*
4. *Create a 3D virtual walkthrough of the new Kiewit Hall and it's classrooms and labs.*
5. *Create and add in more information and educational activities/capabilities for prospective students to explore other STEM degrees within the College of Engineering and around UNL. For instance:*
    a. *Robots Engineering*
    b. *Data Science*
    c. *Architectural Engineering*
    d. *Agricultural Engineering*
    e. *Construction Engineering*
    f. *Environmental Engineering*

6. High Level Architecture Requirements (Technical Specifications)

This app will be updated for all mobile platforms and will be updated to be deployed on the Meta Quest 3 headset using Unity 3D development environment.

7. Development Environment

The app will be developed using the Unity 3D environment and the code will be maintained on a GitHub Repo.

Expected Deliverables from Project Team (Senior Design Provides)

The expectation is a fully functional Android, iOS, WebApp, and Meta Quest 3 mobile application. By the end of this effort the mobile apps will be updated on the Google Play store and the Apple store. Additionally the VR app will be updated on the SideQuest store and the Meta Quest app stores. The team will have to keep performance and optimization in your planning to keep the app frame rate above the 72 frames per the second requirement (https://developers.meta.com/horizon/documentation/unity/unity-perf/). This will be instrumental to successfully deploying to the Meta Quest store.

Supporting Materials (Sponsor Responsibilities and Provisions)

You can check out more information on the state of the system on the Husker STEM VR website at https://www.huskerstemvr.com.

Communication Plan

The communication will be mainly via Teams (text, audio, or Zoom/Teams calls). Meetings will be held via Zoom for weekly meetings and in-person for major milestone meetings would be preferred. The primary contact is available weekly to answer any questions during office hours or at scheduled office/Zoom visits. Email or send a message via Teams and we will get back to you asap.

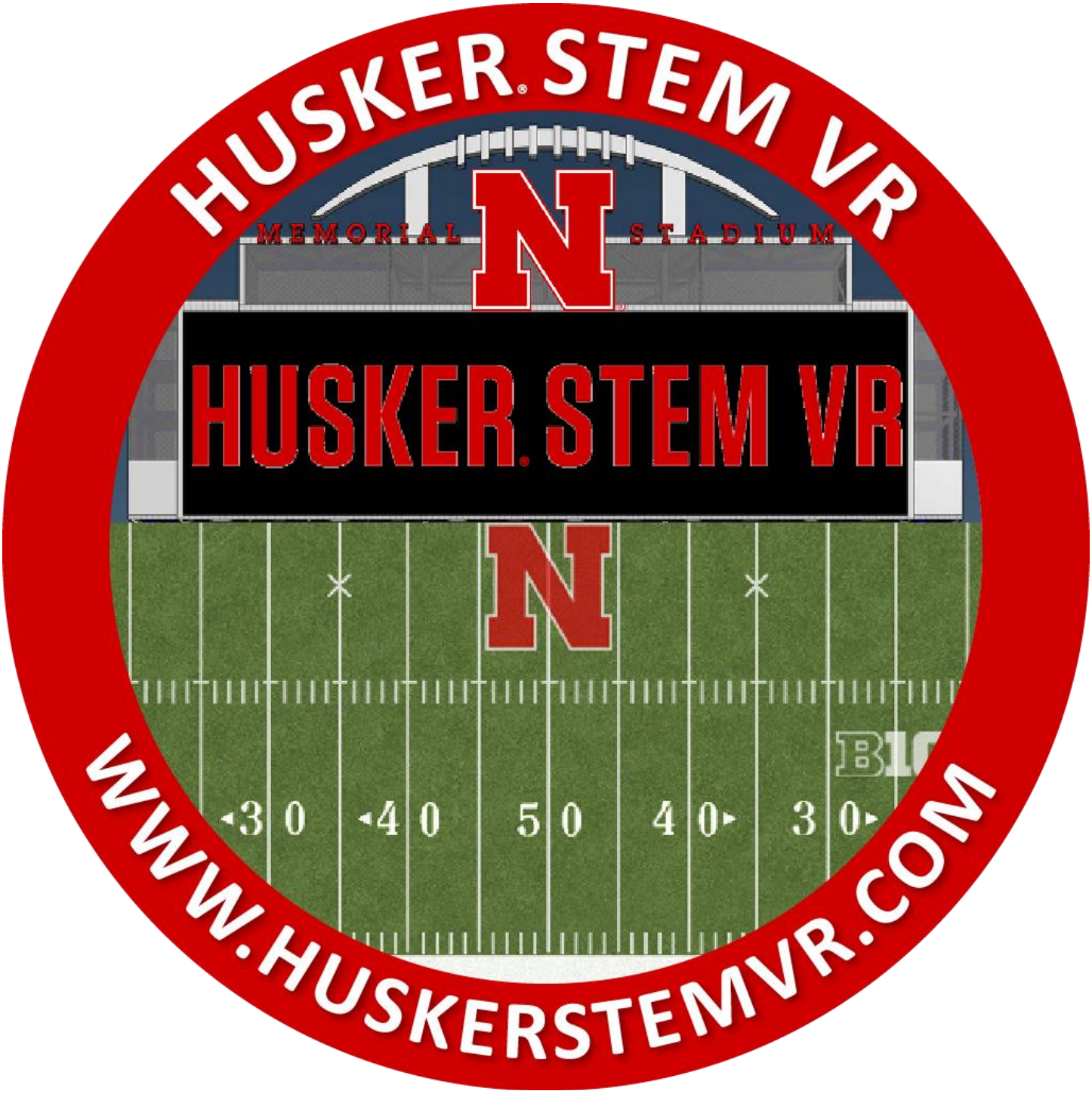
Sponsor Contact Information

Name	Primary Contact (Y/N) Select one person	Contract Signer (Y/N) Select one person	Email Address	Title	Phone Number
Jeff Falkinburg	Y	Y	jfalkinburg2@unl.edu	Assistant Professor of Practice	402-312-8078

Bill To Email Address

Name	Email Address
School of Computing Senior Design	N/A

Organizational Logo



Any Other Information

N/A