

A Novel Immersive VR Platform for H&S Training of Construction Workers

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IRISE ANNUAL MEETING

The Problem

- Construction makes up **1 in 5** deaths for workers in the U.S.
 - OSHA
- The estimated cost of a fatality for a company is **\$1.42M**
 - National safety council
- **60%** of construction accidents happen during the employee's first year of work
 - Bureau of labor statistics
- An average of **776** driver fatalities occurred each year from 1982-2020
 - Federal Highway Administration

Project Objectives

1. **Literature review** on existing VR training programs and current H&S conventional programs
2. **VR architecture** for materialization of the construction sites used in the training program
3. **Training materials** and an **instructor's manual**
4. Recordings of the **test training simulations** (both the rendered simulations and a video feed of the participants will be recorded)
5. **Final report** and recommendations

Project Approach

- Task A: compile a literature review of existing VR training programs and current H&S conventional programs.



(a) electrical injury



(b) object impact



(c) mechanical injury



(d) foundation collapse



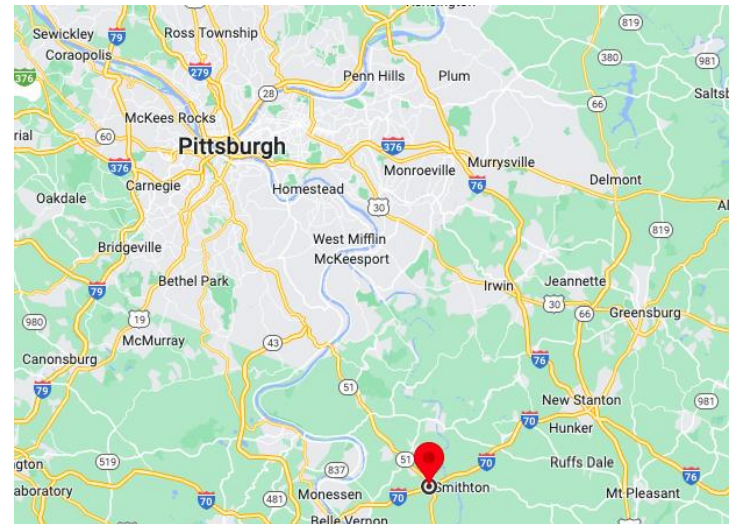
(e) confined space



(f) falling

Project Approach

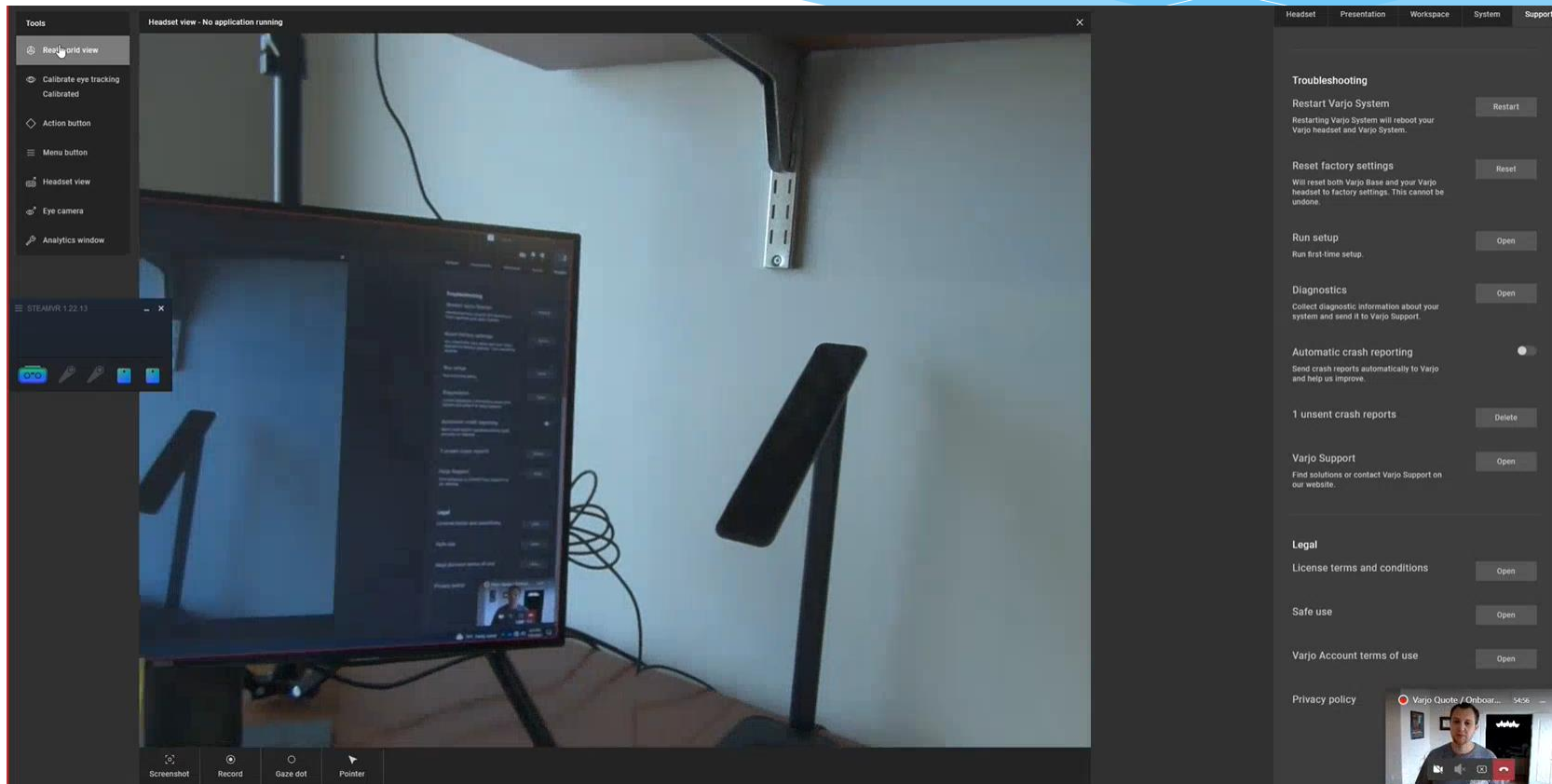
- Task B: VR architecture** for materialization of a given construction site used in the training program.



- Scheduled laser scan of the I-70 at Route 51 interchange project in Westmoreland County (interchange conversion)

Project Approach

Task C: Recordings of the **test training simulations** (both the rendered simulations and a video feed of the participants will be recorded)



Project Approach

- **Task D: Development of Training materials and an instructor's manual**



- Virtual Reality Setup
 - Varjo XR-3: Highest resolution and widest field of view among VR headsets
 - Green Screen setup: Optimized for Extended Reality (XR) video passthrough
- Axiom Holographic Table
 - Displays 3D project files using hologram technology

Schedule/Status

- **Task A:** Underway (80%)
- **Task B:** Underway (40%)
- **Task C:** Planned
- **Task D:** Planned
- **Task E:** Planned