### Objective & Impact of Professor's Research

Professor Becerik-Gerber is creating a virtual reality program to train laborers to work with construction robots. There are many benefits to using virtual reality, including that it is cheaper and more efficient than training workers with the robots themselves. However, the most important advantage is that this will allow workers to experience dangerous situations through virtual reality without being exposed to the physical risks they would face in that situation. This will improve safety conditions as robots are implemented into the construction industry since it will allow workers to better handle these situations and reduce potential injuries.

### Advice for Future SHINE Students

- Learn the basics of each program before attempting to work with them
- Get to know other SHINE students and ask them about their research projects
- When you are working with computers, make extra copies of the project when it works in case future edits are unsuccessful
- Test the programs you make often

### Research Process

#### Week 1
- Learned Unity and Maya basics

#### Week 2
- Animated robot movement sequences in Maya
- Exported animations to Unity

#### Week 3
- Reviewed research proposal for project

#### Week 4
- Animated individual robot motions

#### Week 5
- Programmed robot controls
- Combined robot and construction site

#### Week 6
- Exported project to virtual reality
- Created survey and collected feedback

### Next Steps

I would like to edit the Unity project and take my peers’ feedback into account in order to create a more realistic experience. I would also like to be able to work with virtual reality and coding again in the future. One way I will do this is by taking my school’s AP computer science class this coming year.

### Skills Learned

- Maya
  - used for animating and editing model
- C# coding: allows controller to manipulate robot

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### How This Relates to my STEM Coursework

- Computer Science
  - I used what I learned in my computer science class to write code that controlled the robot

### Feedback

- Object interaction (could walk/see through other objects)
- Robot controls were not intuitive
- Joystick controls did not follow head motion
- Some objects were blurry

### Final project in Unity. PC: Erica De Guzman

### Maya animation of robot. PC: Erica De Guzman

### Acknowledgements

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**Introduction**

In recent years, fewer and fewer people have been entering the workforce as brick masons or other construction laborers, although the demand for these workers is rising. As these trends continue, it will become imperative for the construction industry to find new sources of labor, which may include robots. These robots will not replace human workers, but will instead complete the more menial tasks, allowing workers to focus on other aspects of the construction process and altering the responsibilities that laborers encounter on the job.

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