

# Studying Human-Building Interactions in Active Shooter

## Incidents Through Virtual Reality

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### Introduction

- In recent years, the event of an active shooting has unfortunately become increasingly common, particularly in school and work environments. Evidently, the lack of protection that these modern buildings provide for its occupants clearly demonstrates the urgent need to produce building features that provide proper safety.
- Design suggestions have been released by law enforcement agencies, but these particular suggestions cater towards terrorist incidents which focus on improving building security. The impact that these suggestions have on occupant behavior in active shooter incidents is still undetermined.
- Virtual environments have the potential of being a useful method in conducting studies on active shooting incidents to further investigate which suggestions and building features provide the most protection for building occupants.



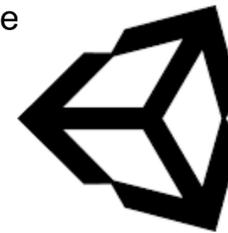
PC: Cable News Network (CNN)

### Objectives & Impact of Professor's Research

- The primary objective of this research is to investigate how particular building features have the potential of reducing attack risk in active shooting incidents with the use of virtual environments.
- Findings from studies such as these provide additional knowledge towards the improvement of building safety in these scenarios.

### Skills Learned

Through this experience I was able to learn how to use Unity, where I was able to create a virtual environment. In order to design a realistic virtual environment, I assigned textures to the interior and exterior of the school building including the ground, walls, furniture, and more. To assign textures to objects I imported texture packages from the Unity Asset store. I was also able to import props such as a lamp post or a bench into the environment through the Unity Assets store. In addition, I have gained a basic knowledge of coding and how it is used to manipulate the objects in the virtual environment.



Main Entrance of School Environment in Unity  
PC: Ameyalli Hill



Conference room  
PC: Ameyalli Hill



Classroom View  
PC: Ameyalli Hill

### Future Steps

- The future of this research has great potential in developing the best building attributes that will protect and possibly save the lives of those in active shooter incidents.
- This first-hand experience and exposure to a research environment has shown me that I truly want to pursue research. I personally enjoyed the computer aspect of civil engineering and aspire to continue learning more about it.

### Advice for Future SHINE Students

- Don't be ashamed to not know something. Your peers and mentors are there to help you.
- Make connections with other SHINE students and ask them about their labs.
- Be open to learning more about other engineering fields.

### Acknowledgements

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