Active Shooter response module for CS building using Unity 3D

Project Report

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Abstract:

The aim of this project is to create a virtual active shooter response module for CS building using unity 3D. In this application, the user will have an option to enter the application as a policeman or as a regular (student, staff, visitor or worker) person in the building. When the user selected policeman, then the user will take a police responsibility. In this mode, the user will have an opportunity to take training by video. After the training video, the user can practice the protocols that the cops follow during active shooter elimination. practicing the target elimination in the real world is very hard because the creation of the scenario is very hard. But by using VR one can create the required environment for getting the required environment. in the second mode, the user can enter as a regular person. This will help to train people how to react in the active shooter situation. In this mode, the user will have an option to get instructions from a brief video. After the video user can practice the necessary steps to follow. The whole aim of the project is to replace the mock drill with this application.

Introduction:

Now a days there are so many situations are happening unexpectedly in the buildings (like fire, active shooters, exploding etc.), The remedy for this is performing several mock drills, but performing mock drills will cost more because of time they are using to perform mock drill is taken from their working hours. The main aim is to save time and cost, the remedy for this is creating similar situation with same building structure in computer and by using oculus one can get immersed into the situation. The beauty of the oculus is making user to think That they are in the real world even when they know they are using the oculus.

Another advantage using unity is, it has a capability to connect different hardware equipment's, so that based on the user needs one can load the application in any device. By using this application user can practice different scenarios as many times as possible, which helps user to get to know about the different scenarios. This application contains two different modes, the first mode (Employee simulation) helps to practice different scenarios as a civilian and the second mode (Policeman simulation) helps to train the building security or to the first responders.
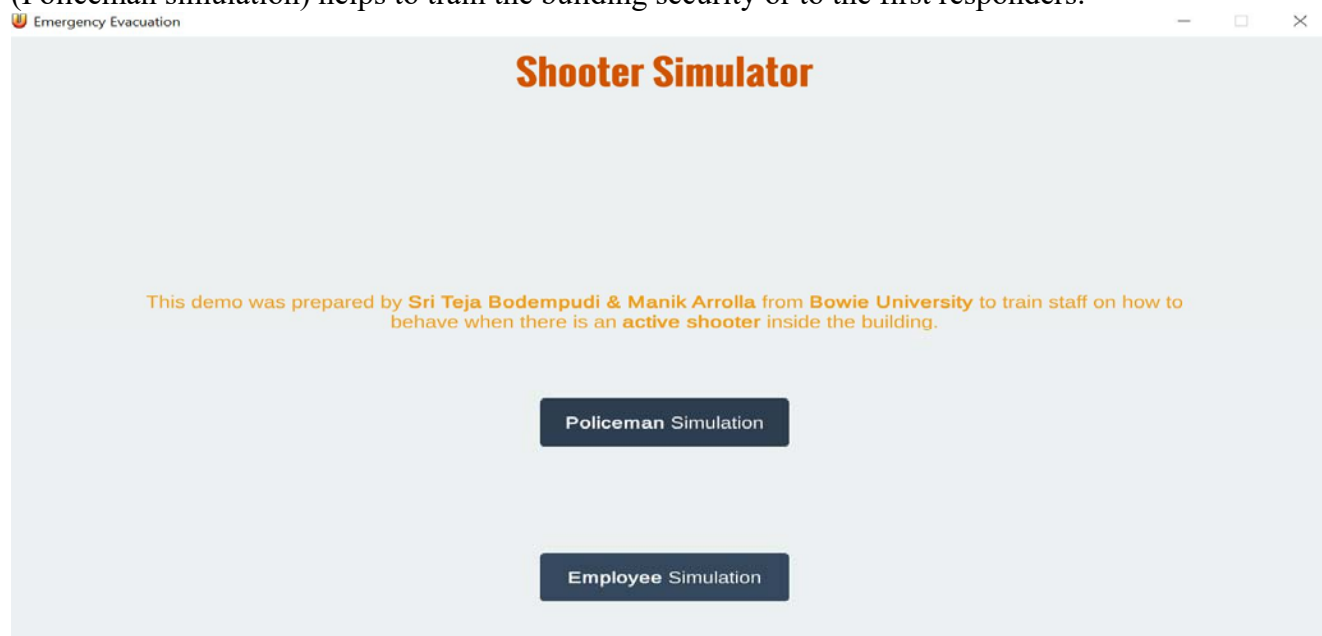

Fig1: User having two options to choose mode to practice.

Implementation And Designer

This application has designed to train civilian and first responders for a building. For this this has two different modes so that the user will have a chance to choose based on their roll as shown in fig1. After choosing the mode a related video will play, this video contains the basic steps need to be followed at that situation. As in fig2.
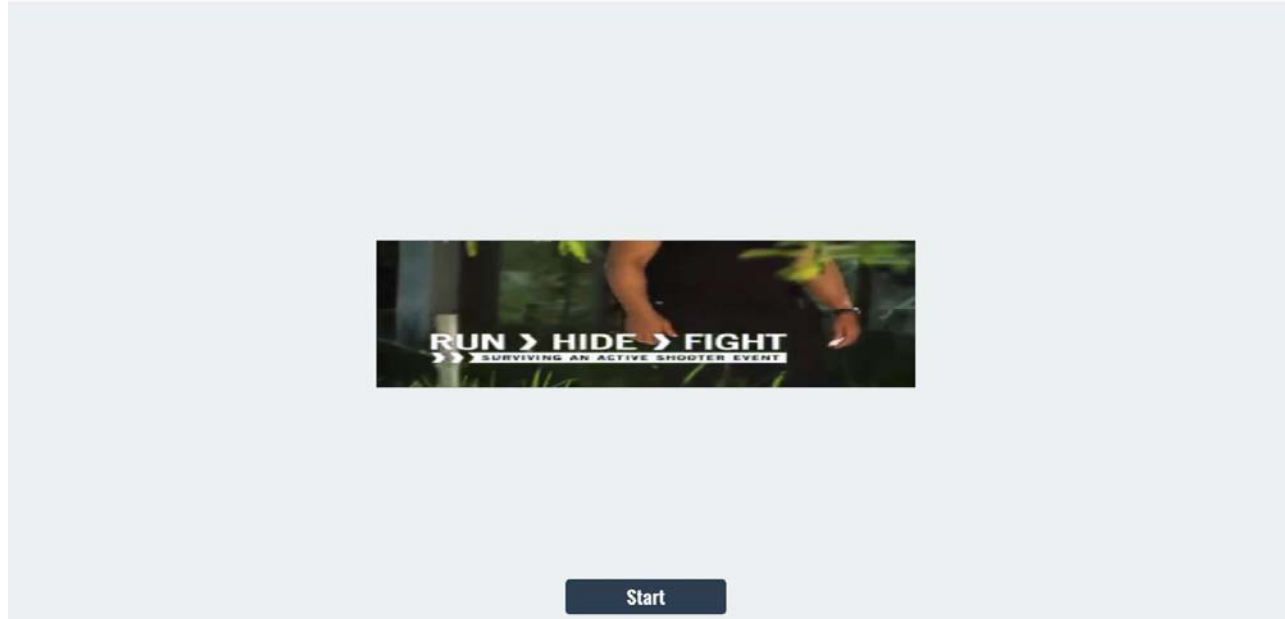

Fig2: The video playing to guide the user.

The two modes are **police simulation** and **Employee simulation,** each mode has different scenarios. Let's look into the scenarios in each mode.

police simulation:

In the police simulation, the main aim is to save employees life and eliminating the target (active shooter). When the simulation started there will be a preview of the situation, this has been achieved by using multiple cameras views in the developed 3D model of the building. These cameras are loaded with the script so that these cameras will enable in a sequence to create the game seance. This will help the user to know how the situation in the building. After this preview the video with the protocol need to follow will describe as shown in fig2.

After the video instruction, the training mode will start. In this mode user has access to the weapon as shown in fig3, since the mode is designed to train the policeman. The active shooter will move in the building randomly. When shooter finds the policeman then the shooter starts shooting at policeman, so the task here is to eliminate the shooter as soon as policeman finds the shooter, as shown in fig 4. Number of bullets in the weapon will be displayed in the bottom left corner and the health is shown in left bottom corner. As the shooter movements are dynamic this creates different scenarios to train the policeman.

Fig3: User grabbed the weapon to eliminate the target.

Fig4: User eliminating the active shooter.

Employee Simulation:

The main aim of the employee simulation is to train the employees, when they face the active shooter situation. This simulation also has the same feature as police simulation. In this mode user will have a video training to know what to do during the active shooter situation. This video originated and was downloaded from the FBI and Department of Homeland Security "Active Shooter Awareness – Options for Consideration". This video explains about Run, Hide and Fight theory.

Now in this application, the use will need to practice these three factors run, hide and fight. In some rooms there are some objects to grab for fighting with the user as shown in fig 5 and fig 6. When the situation starts the user will need to run and hide, the active shooter will search for the people hiding and try to shoot them. When the active shooter approaches the user then the user needs to grab the things and hit the shooter, so that the target will get injured and slow down, then the user will get more time to escape.

Fig5: Movable objects to throw at active shooter.

Fig6: object throwing by the user.

Fig7: Identifying the active shooter by user.

Conclusion:

In conclusion we are able to successfully develop the application to train the user. We are able to successfully train the user with this application. Also this application helps to get to know about the building.

Appendix

Screenshots:

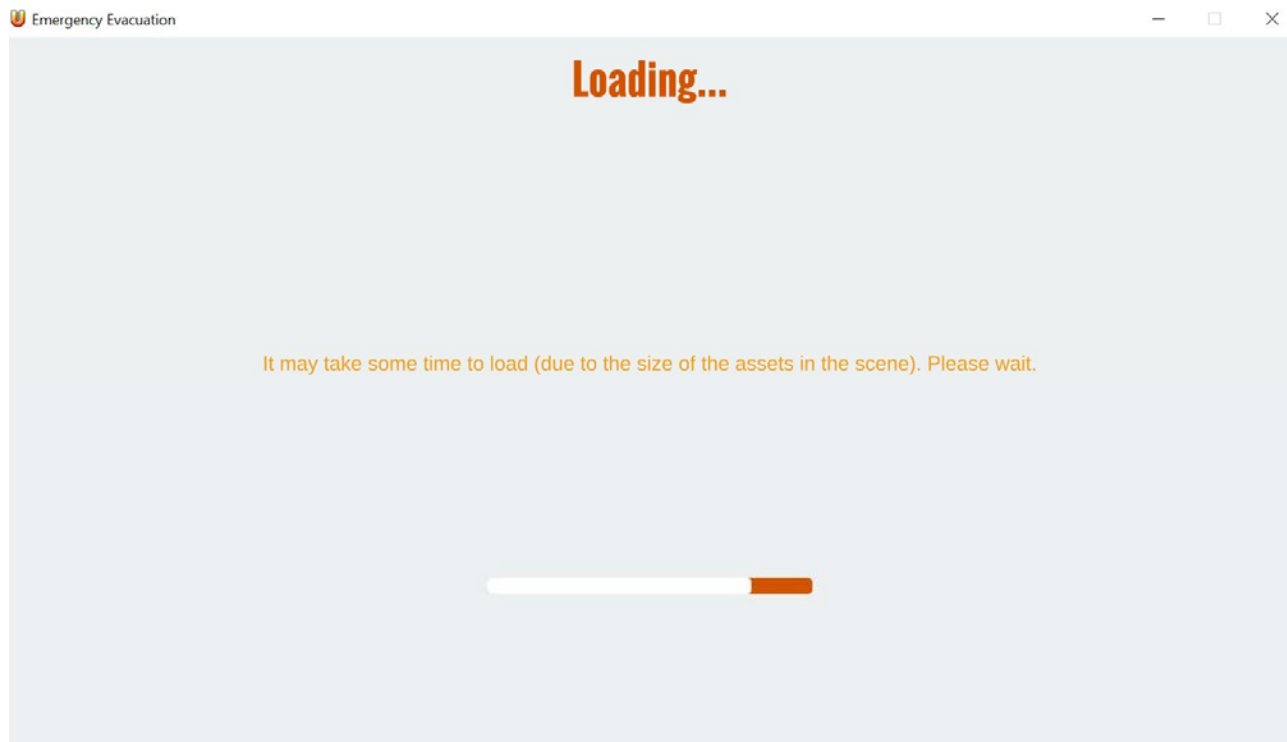Fig8: people scarring after exploding the bom.

Fig9: Scene loading screen.

Fig10: People are moving normally in the environment.

Fig11: Staff having conversation in copy room.
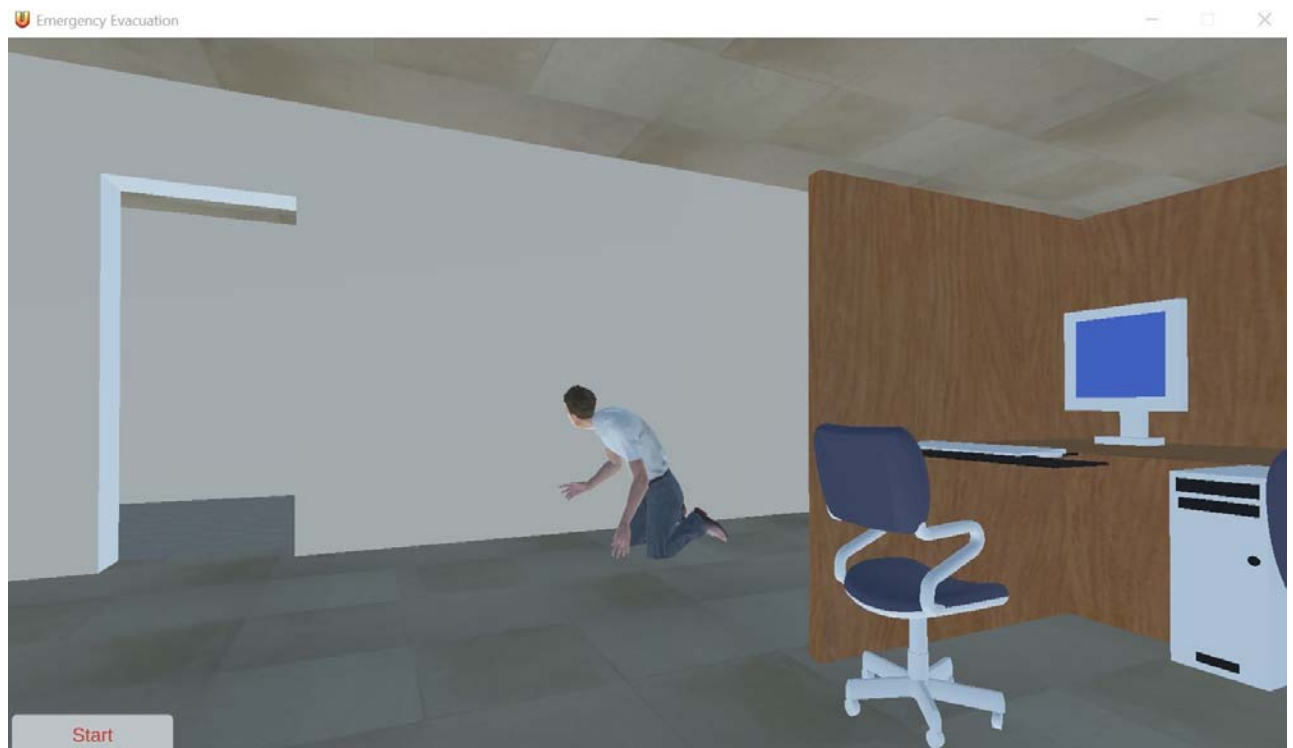
Fig12: Corridor view of the 1st floor.

Fig13: person hiding in the lab when the user is scared.

Fig14: fire spreading on 1st floor when boom explodes.