Covid-Zombies

A Grocery Store VR Simulation

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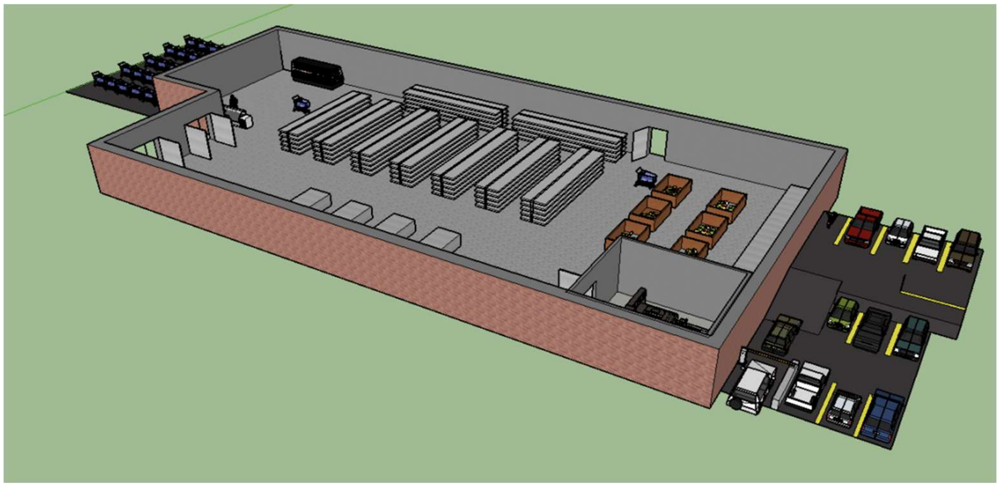
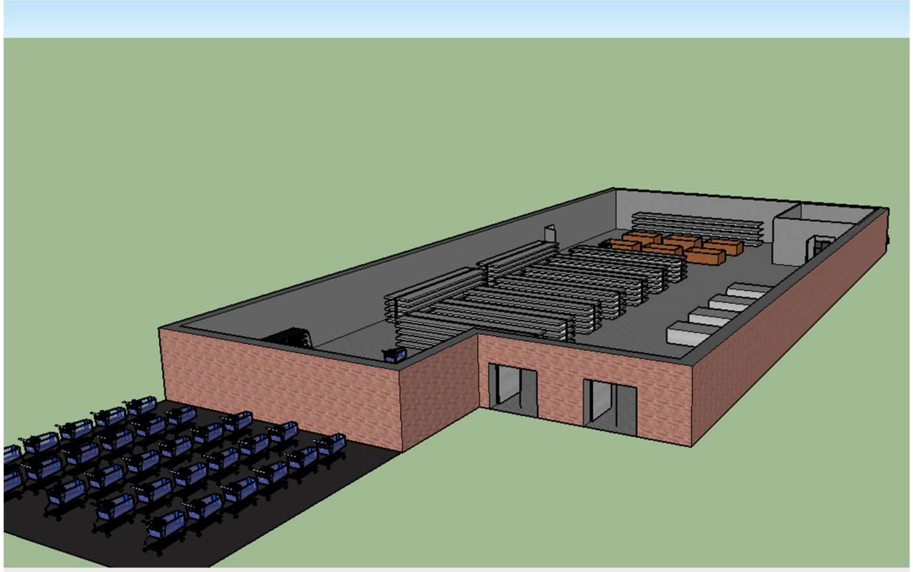
Covid-Zombie Attack!

Goals/Objectives: The goals of this project were to demonstrate the evacuation procedures in the event of a “Covid-zombie” attack. The anticipation was to demonstrate how a customer could evacuate a sudden hostile situation. We assumed the customer would have three options; to run out of the building, to hide behind objects (crates in our case), or to use an object to fight in self-defense. The plot of the attack was a grocery store. The grocery store is located in a mini city. The models used to create the mini city and the grocery store, were derived from Google Sketch-up. Unfortunately, during importation of the environment, the city did not load into Vizard as expected. We had to revert to our original attempt at simply keeping the inside of the grocery store as the environment as seen below.



The target audience for this simulation, is anyone in a building who needs to escape. Ideally, in any hostile situation, the person has the option to run, hide, or fight. Though these are relatively “scary” conditions, we chose to present the information with a satire approach to lighten the mode. The real-world application for this project could be a grocery store owner who takes pride in the assurance that his customers are aware of their escape options in the event of an attack.



As previously mentioned, the models for this project were exported from Google Sketchup. We used the zombie model to decipher where the user could and could not travel. For example, the idea was that if the user ran into a zombie avatar, the user would lose life. If the user ran into the zombie model too many times, the user would contract the virus and the simulation would start over. This was our intention, however, we were not able to code this into the scenario. We also used the built-in avatars in Vizard. Those were our regular customers. We received a suggestion to modify the appearance of the avatars to resemble zombies. Doing so would allow the use of the avatar states as well. Though this was a very good suggestion, we were not able to implement it.

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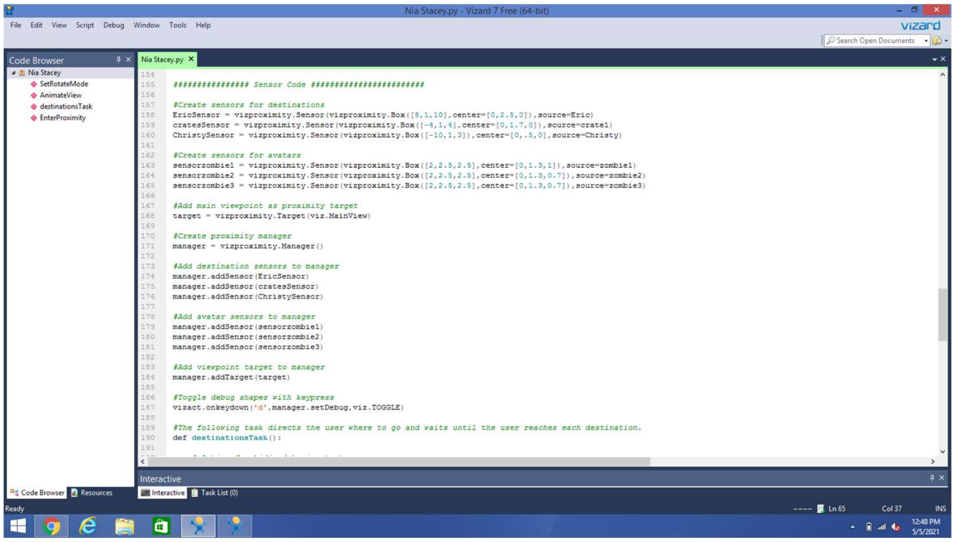
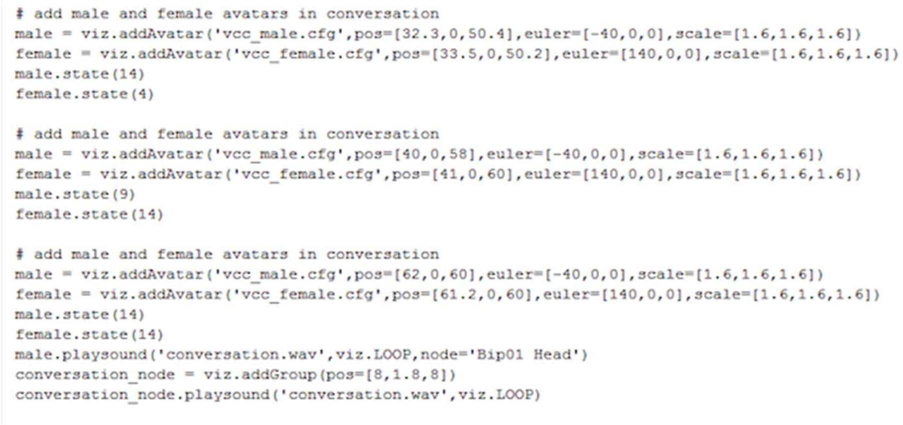
Programming: This was by far the toughest portion of the project. Python is neither our language of expertise nor comfortability. It was a challenge to write the code to make the project execute the way we wanted to see it execute. We were able to insert all of our desired components into the scene, when it came time to make those components interact with each other; this is where it became difficult. For example, we figured out how to attach the proximity sensor to an object. We did this so that when the user approached the object, Vizard would recognize that the user either did or did not follow the directions correctly. Where we ran into problems was figuring out how to display the proximity directions. In retrospect, the proximities were correctly attached to the model, however the user had no way of knowing they were supposed to walk over to the door or hide behind the crates or use the shopping cart in self-defense. Below is a snapshot of our code for the proximity sensors.



```
################ Sensor Code ########################

#Create sensors for destinations
EricSensor = vizproximity.Sensor(vizproximity.Box([8,1,10],center=[0,2.5,0]),source=Eric)
cratesSensor = vizproximity.Sensor(vizproximity.Box([-4,1,4],center=[0,1.7,0]),source=crate1)
ChristySensor = vizproximity.Sensor(vizproximity.Box([-10,1,3]),center=[0,.5,0],source=Christy)

#Create sensors for avatars
sensorzombie1 = vizproximity.Sensor(vizproximity.Box([2,2.5,2.5],center=[0,1.3,1]),source=zombie1)
sensorzombie2 = vizproximity.Sensor(vizproximity.Box([2,2.5,2.5],center=[0,1.3,0.7]),source=zombie2)
sensorzombie3 = vizproximity.Sensor(vizproximity.Box([2,2.5,2.5],center=[0,1.3,0.7]),source=zombie3)

#Add main viewpoint as proximity target
target = vizproximity.Target(viz.MainView)

#Create proximity manager
manager = vizproximity.Manager()

#Add destination sensors to manager
manager.addSensor(EricSensor)
manager.addSensor(cratesSensor)
manager.addSensor(ChristySensor)

#Add avatar sensors to manager
manager.addSensor(sensorzombie1)
manager.addSensor(sensorzombie2)
manager.addSensor(sensorzombie3)

#Add viewpoint target to manager
manager.addTarget(target)

#Toggle debug shapes with keypress
vizact.onkeydown('d',manager.setDebug,viz.TOGGLE)

#The following task directs the user where to go and waits until the user reaches each destination.
def destinationsTask():

```

Functionality: In reference to the functionality, we used the sounds from Vizard to mimic customers having a conversation. The interactivities were the user's ability to run, find the crates to hide, or pick the cart to fight. We used proximity sensors to decipher where the user could travel. We were not able to insert the sound for zombies. Our initial goal was to start the simulation with regular grocery music; then, the background music would sort of change into a more horrific panic sound. From there the simulation would begin with the user being prompt to select one of the escape options; run, hide, or fight. Though we were not able to implement that sound, we were able to use the avatars given by Vizard to our advantage. Below is a snapshot of the code used to put the avatars in conversation.



```
# add male and female avatars in conversation
male = viz.addAvatar('vcc_male.cfg',pos=[32.3,0,50.4],euler=[-40,0,0],scale=[1.6,1.6,1.6])
female = viz.addAvatar('vcc_female.cfg',pos=[33.5,0,50.2],euler=[140,0,0],scale=[1.6,1.6,1.6])
male.state(14)
female.state(4)

# add male and female avatars in conversation
male = viz.addAvatar('vcc_male.cfg',pos=[40,0,58],euler=[-40,0,0],scale=[1.6,1.6,1.6])
female = viz.addAvatar('vcc_female.cfg',pos=[41,0,60],euler=[140,0,0],scale=[1.6,1.6,1.6])
male.state(9)
female.state(14)

# add male and female avatars in conversation
male = viz.addAvatar('vcc_male.cfg',pos=[62,0,60],euler=[-40,0,0],scale=[1.6,1.6,1.6])
female = viz.addAvatar('vcc_female.cfg',pos=[61.2,0,60],euler=[140,0,0],scale=[1.6,1.6,1.6])
male.state(14)
female.state(14)
male.playsound('conversation.wav',viz.LOOP,node='Bip01 Head')
conversation_node = viz.addGroup(pos=[8,1.8,8])
conversation_node.playsound('conversation.wav',viz.LOOP)
```

Behaviors: Mainly, we wanted the avatars in the environment to show case a sense of peace at the beginning of the simulation. Then, we wanted to show the panic of these shoppers when Covid zombies enter the store. As we worked with the project, we decided it would be more practical to have the customers remain calm; and instead just maintain their six-feet distance so as to not contract the virus. We felt our second approach was more realistic to the real world. In the environment, you can see most of the avatars having light conversations, cheering, picking items up, etc. We used a combination of the avatar states in Vizard.

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<u>Why VR:</u> Virtual Reality is great in that it allows a user to play out a scenario multiply times with different factors. The purpose of this project was ideally to educate a grocery store shopper, different tactics to use in a hostile shopping situation. Because this simulation is virtual, it can be replayed repeatedly, thereby exploring every possible outcome. It is also great that this is virtual, because the information can be shared across the globe! This allows for very important information to be shared with individuals who would otherwise not have access to the info. Let's suppose for example, we needed to conduct a training in some far off country; in less than 30 minutes, we could share this simulation with someone who is thousands of miles away; this is thanks to the VR experience.

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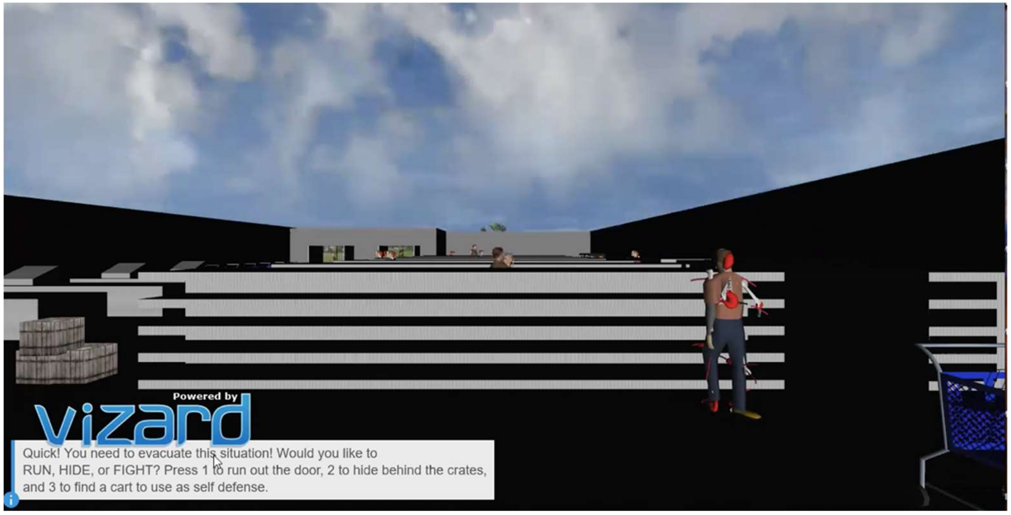
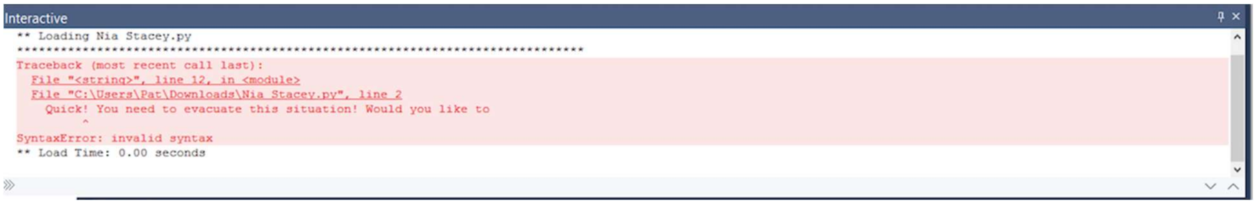


Quick! You need to evacuate this situation! Would you like to RUN, HIDE, or FIGHT? Press 1 to run out the door, 2 to hide behind the crates, and 3 to find a cart to use as self defense.

<u>Shortcomings/Improvements:</u> We actually had quite a few shortcomings in this assignment. To start off, the coding language was a barrier as we were absolutely new to it. Often times, something that may seem trivial to an expert Python writer (such as a variable being used more than once), was completely unnoticed by us. We were not able to fully implement this scenario the way we originally intended. We do not feel we “bit off more than we could chew”, it was more so a lack of knowledge with the software and language. If we had to complete this assignment a second time, we would absolutely invest in a tutor whose job it would be to teach us first the rules of Python. We believe that knowledge would have elevated the quality of our project immensely. Below we show some of the error codes we encountered.



```
** Loading Nia Stacey.py
******************************************************************************
Traceback (most recent call last):
  File "<string>", line 12, in <module>
  File "C:\Users\Pat\Downloads\Nia Stacey.py", line 2
    Quick! You need to evacuate this situation! Would you like to
         ^
SyntaxError: invalid syntax
** Load Time: 0.00 seconds
```

<u>Conclusion:</u> To end, this project was entertaining when we crossed over a hurdle. For example, it was a good feeling when we figured out how to correctly import the environment from Sketch-up to our Vizard platform. We were very excited when we were able to add sound to the project. Though those may seem like small victories, they were the ones that kept us going. We also know there are many smaller details that we were not able to implement; those are our lessons for future VR engagements.