

Group 10

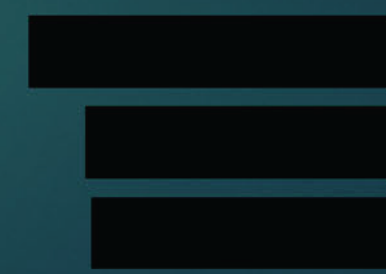
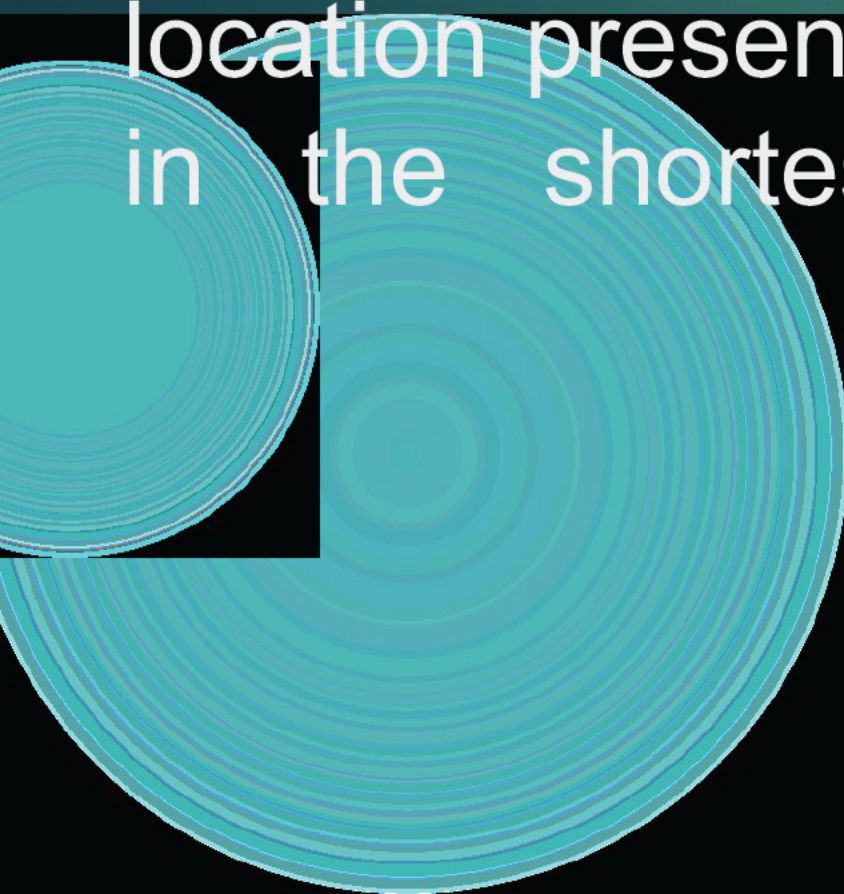
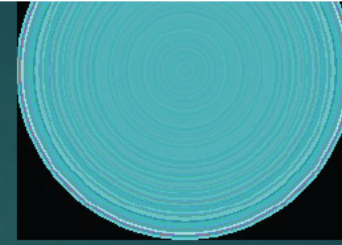
Target Driven Navigation

DEEPAK KUMAR P HONAKERI

SAISHASHANK KONDURI

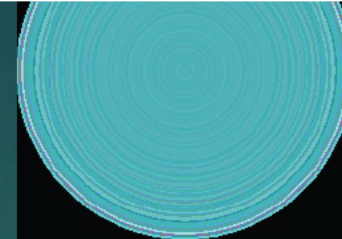
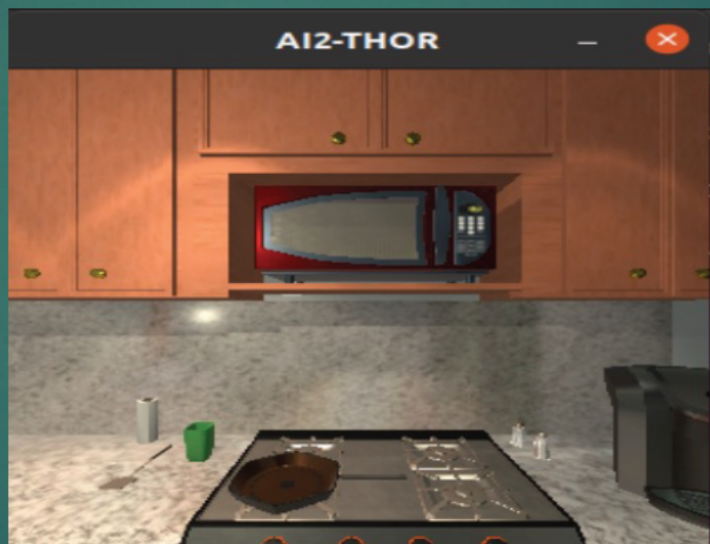
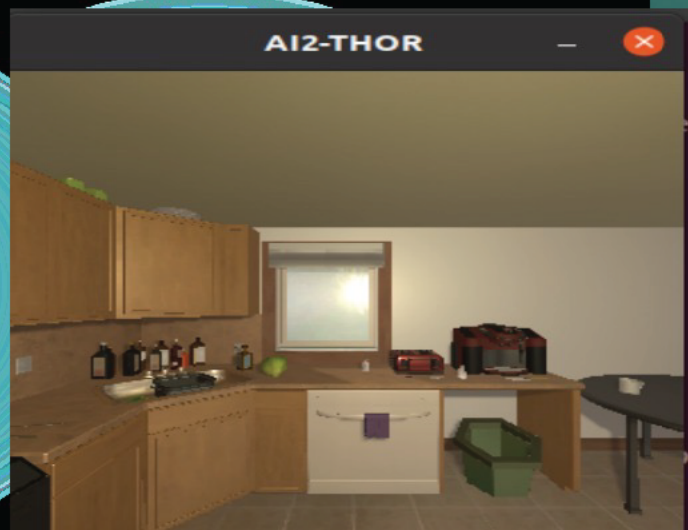
SANGITA JAYENDRAN

Aim - To move the agent to a desired target location present in the environment by navigating in the shortest path using the grid world.

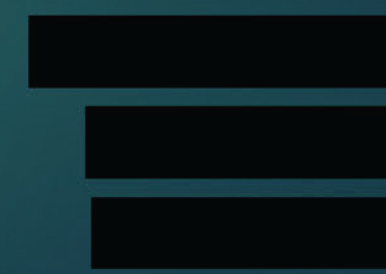
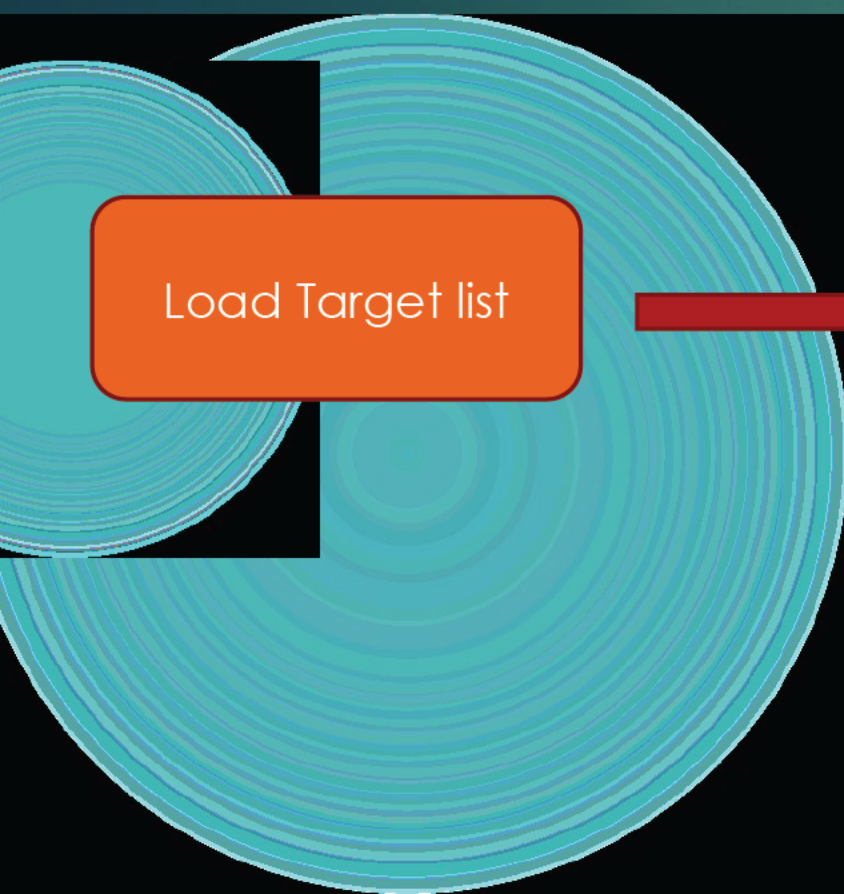
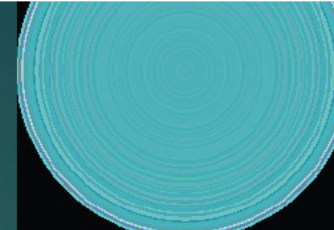
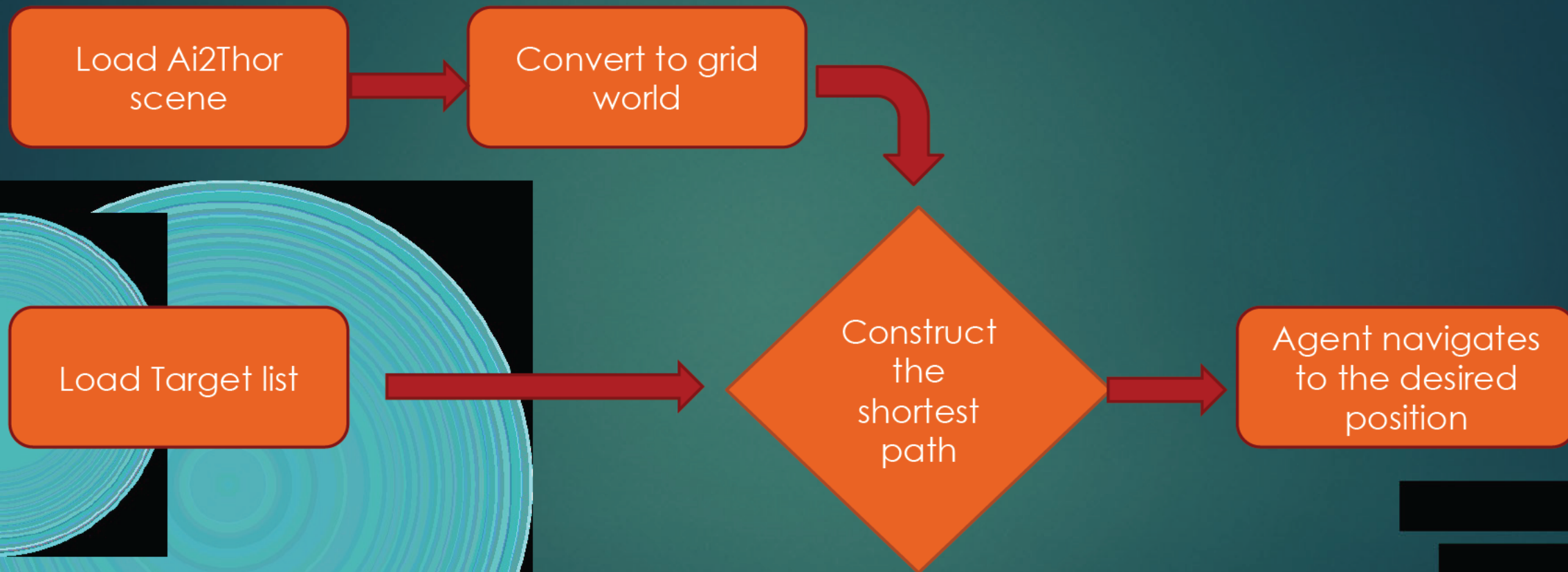


Environment

▶ AI2THor Kitchen scene



Flow of the code



Methodology

- ▶ Convert the Ai2Thor scenes into a grid world using the x and z axis (top view)

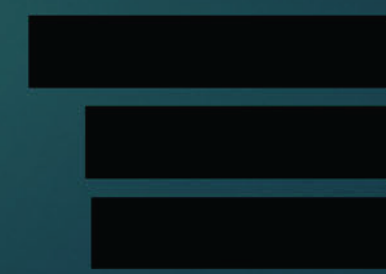
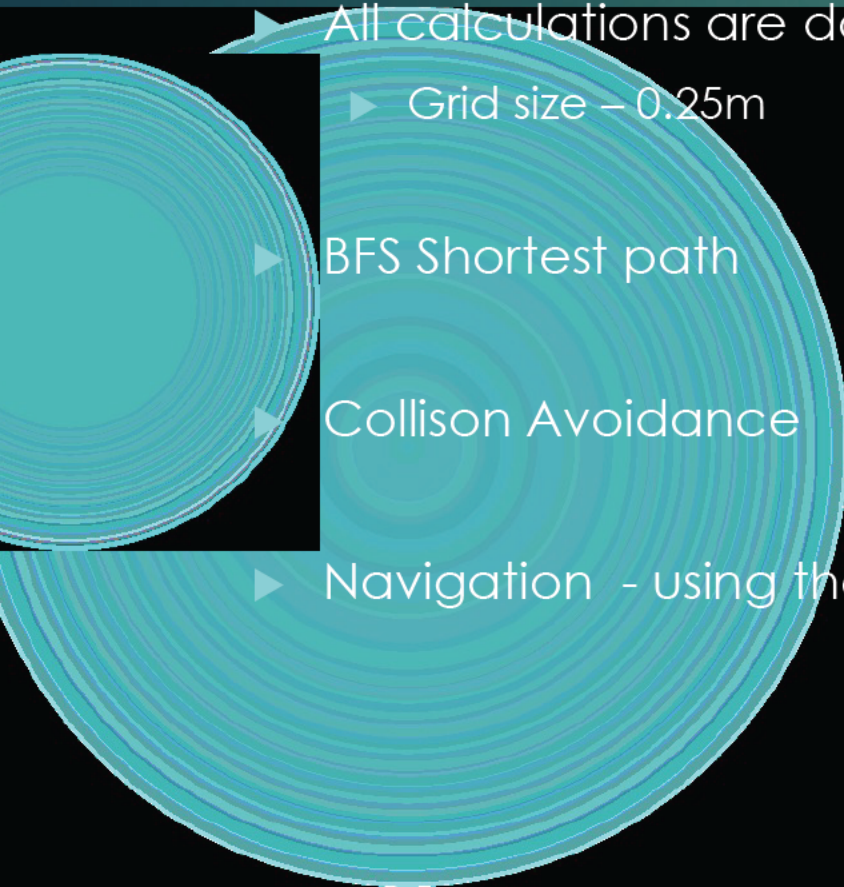
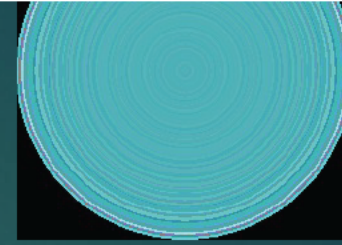
- ▶ All calculations are done based on the grid settings

- ▶ Grid size – 0.25m

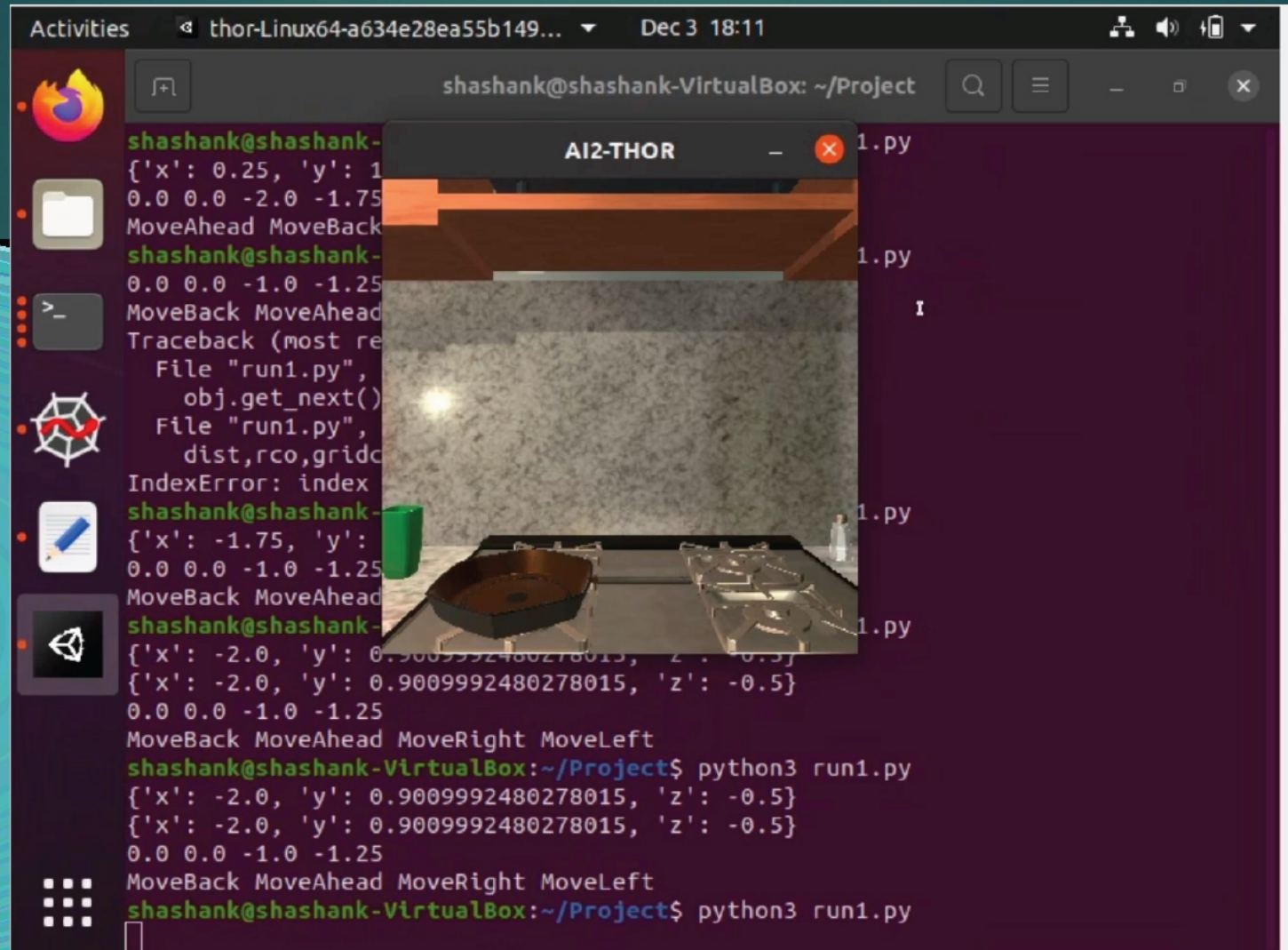
BFS Shortest path

Collision Avoidance

- ▶ Navigation - using the controller commands



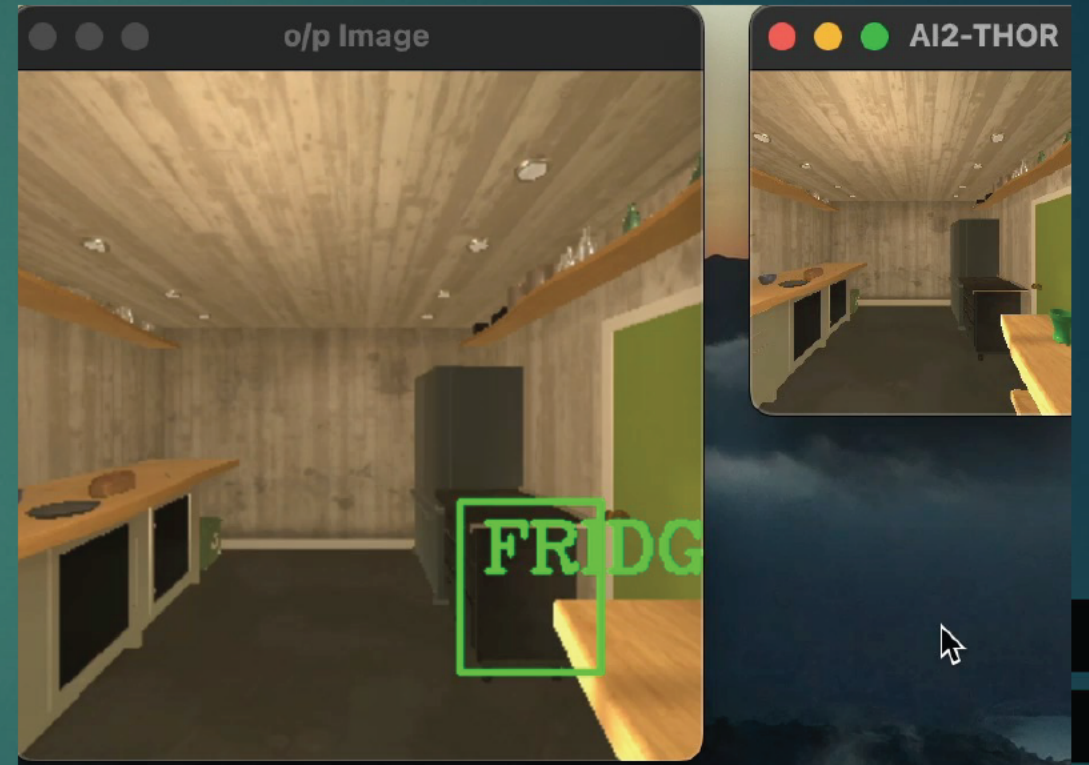
Navigation with target - Fridge



The screenshot shows a Linux desktop environment with a terminal window and a 3D game window. The terminal window displays the output of a Python script named 'run1.py'. The output consists of several lines of coordinate data and movement commands. The 3D game window, titled 'AI2-THOR', shows a first-person view of a kitchen environment with a stove, a green cup, and a white wall.

```
shashank@shashank-VirtualBox: ~/Project
shashank@shashank-VirtualBox:~/Project$ python3 run1.py
{'x': 0.25, 'y': 1.0, 'z': 0.0}
0.0 0.0 -2.0 -1.75
MoveAhead MoveBack
shashank@shashank-VirtualBox:~/Project$ python3 run1.py
0.0 0.0 -1.0 -1.25
MoveBack MoveAhead
Traceback (most recent call last):
  File "run1.py", line 1, in <module>
    obj.get_next()
  File "run1.py", line 1, in <module>
    dist, rco, gridc
IndexError: index out of range
shashank@shashank-VirtualBox:~/Project$ python3 run1.py
{'x': -1.75, 'y': 1.0, 'z': 0.0}
0.0 0.0 -1.0 -1.25
MoveBack MoveAhead
shashank@shashank-VirtualBox:~/Project$ python3 run1.py
{'x': -2.0, 'y': 0.9009992480278015, 'z': -0.5}
{'x': -2.0, 'y': 0.9009992480278015, 'z': -0.5}
0.0 0.0 -1.0 -1.25
MoveBack MoveAhead MoveRight MoveLeft
shashank@shashank-VirtualBox:~/Project$ python3 run1.py
{'x': -2.0, 'y': 0.9009992480278015, 'z': -0.5}
{'x': -2.0, 'y': 0.9009992480278015, 'z': -0.5}
0.0 0.0 -1.0 -1.25
MoveBack MoveAhead MoveRight MoveLeft
shashank@shashank-VirtualBox:~/Project$ python3 run1.py
```


Sidetrack – navigation using Computer Vision



Future tasks

- ▶ Reducing the time taken to calculate and map the grid
- ▶ Getting the exact view once the agent reaches the desired location

