Challenge 2 Report

Author

Nguyễn Duy Quang
(16020271)

Phí Văn Minh
(16022411)

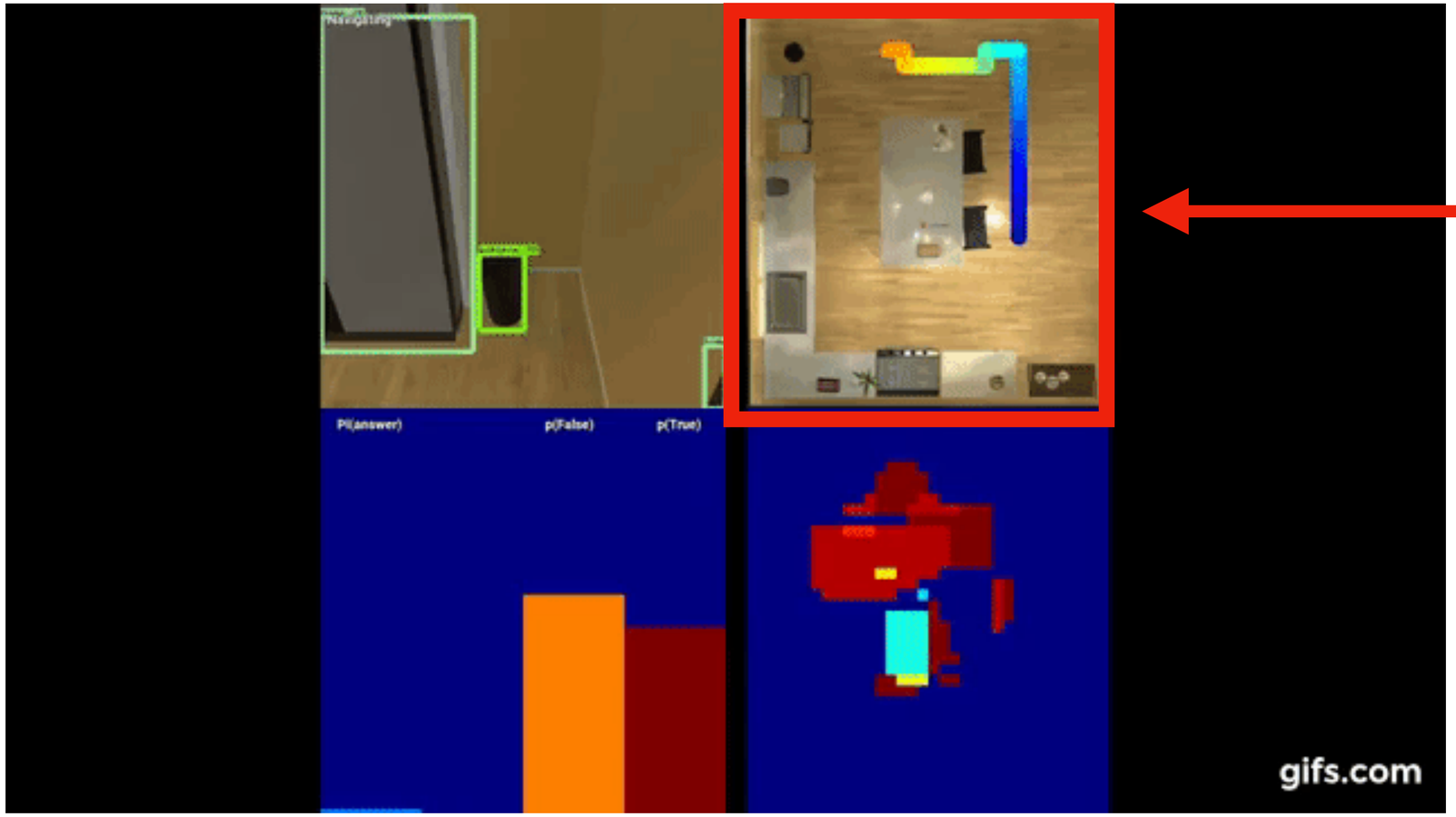
Lê Trung Thông
(16020286)

Outline

1. Problem
2. Solution
3. Get Topview Map
4. Localization
5. Event Processing
6. Demo

Problem

Challenge 02: *Drawing Trajectories on Top-view Map of the room.*



Topview Map

Solution

Get Topview Map

```
event = controller.step(dict(action='ToggleMapView'))
```

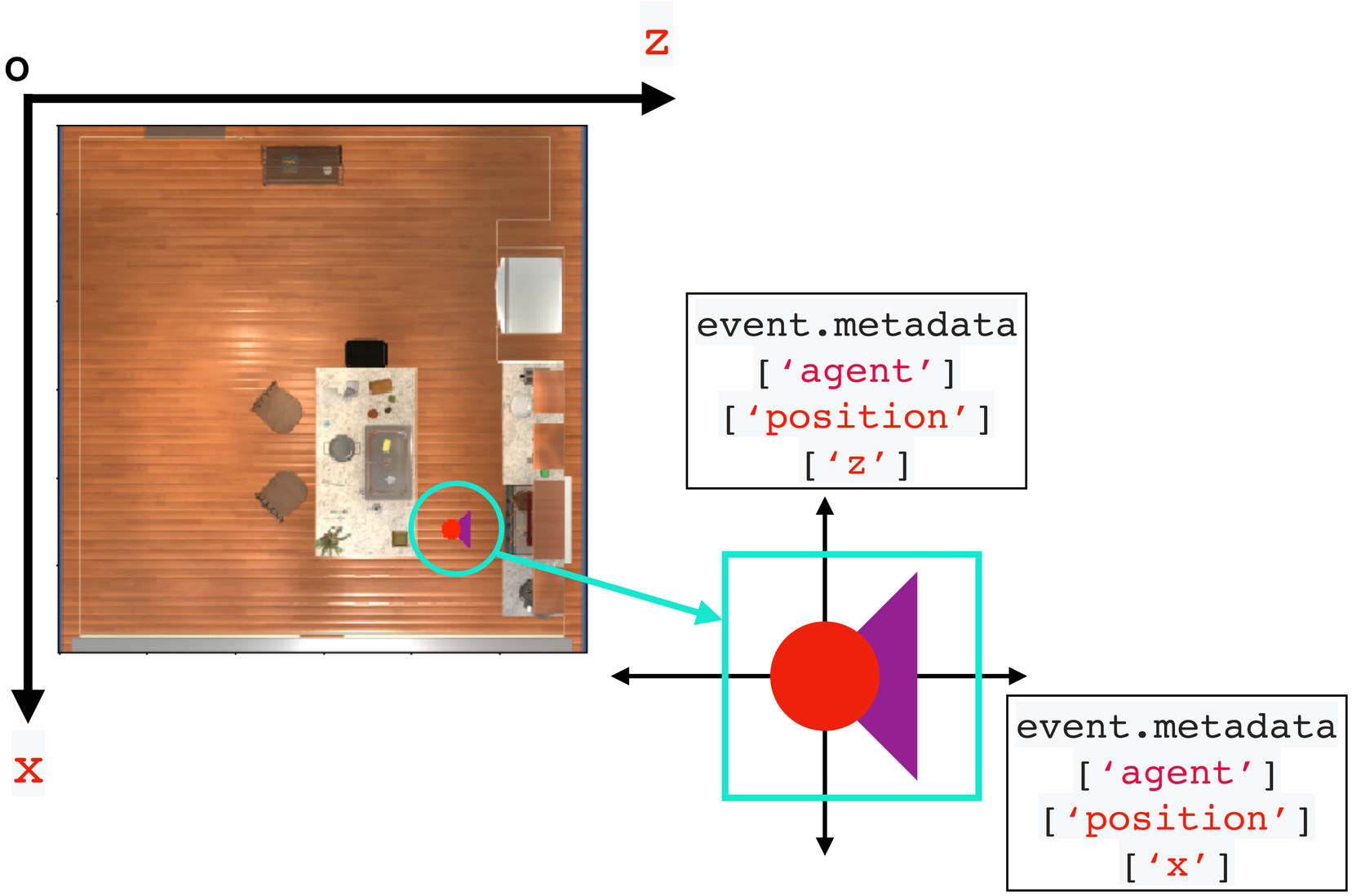
Run the code above once to get a top view and again to get back to the normal view

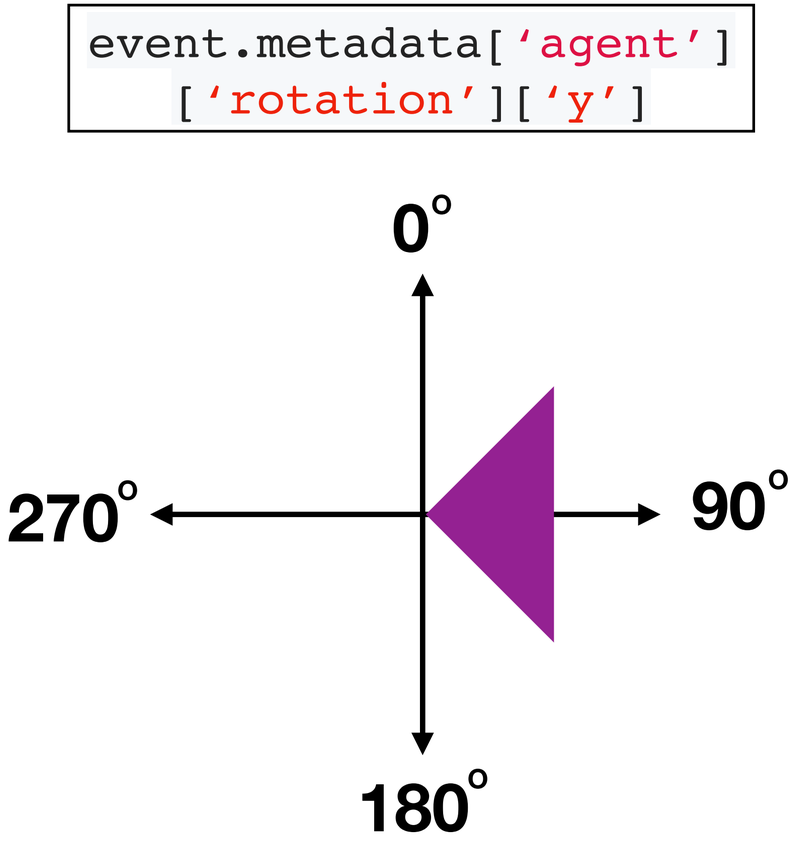
Localization

TopView Map

TopView Map and Robot position

Localization

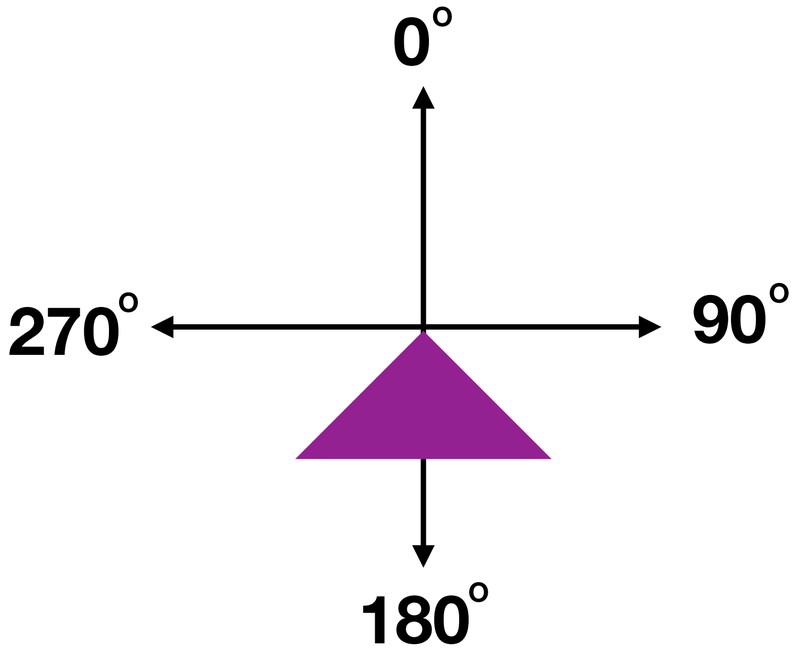




Localization

FloorPlan28

```
event.metadata['agent']
    ['rotation']['y']
```



Localization

Localization

Using ThorPositionTo2DFrameTranslator(position) class to convert agent's local position to global position

https://github.com/allenai/ai2thor/issues/124

Rotation

Two dimensions [edit]

In two dimensions, to carry out a rotation using a matrix, the point (x, y) to be rotated counterclockwise is written as a column vector, then multiplied by a rotation matrix calculated from the angle θ:

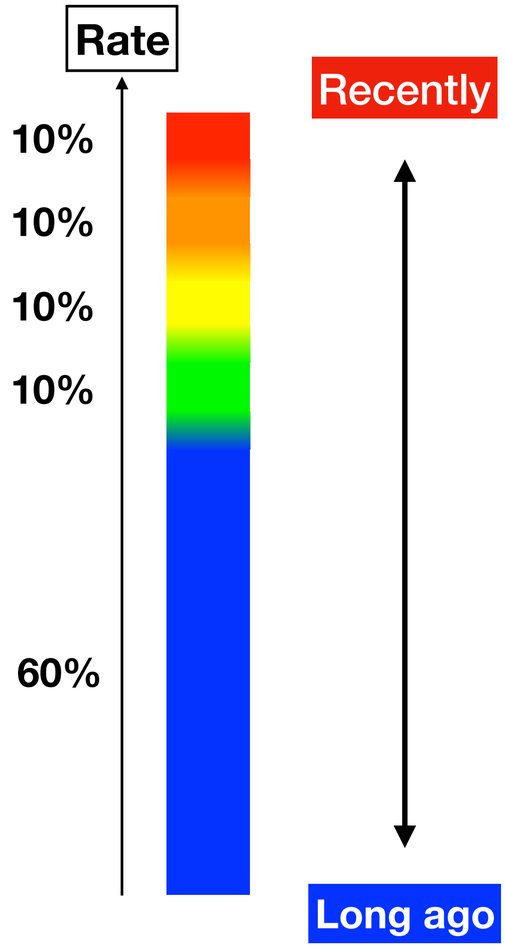
$$\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix}.$$

The coordinates of the point after rotation are x', y', and the formulae for x' and y' are

$$\begin{aligned} x' &= x\cos\theta - y\sin\theta \\ y' &= x\sin\theta + y\cos\theta. \end{aligned}$$

https://en.wikipedia.org/wiki/Rotation_(mathematics)

Event Processing



Trajectories in FloorPlan28

List “listCircle” saves all position that the agent visited

Demo

Let’s enjoy

THANKS FOR LISTENING