



# Introduction to Robotic Simulators

# Robots are expensive

—





# Domains



# Cars



CARLA



Microsoft AirSim



# Mazes



VizDoom



Deepmind Lab



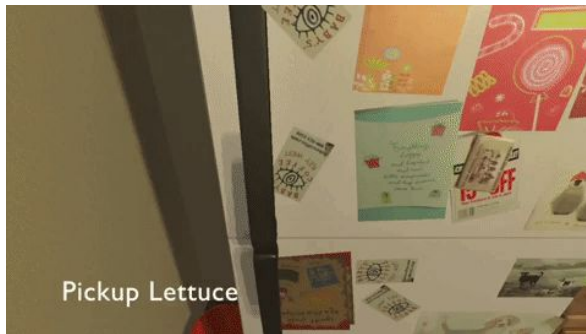
Microsoft Malmo



# Homes



Matterport3D Simulator

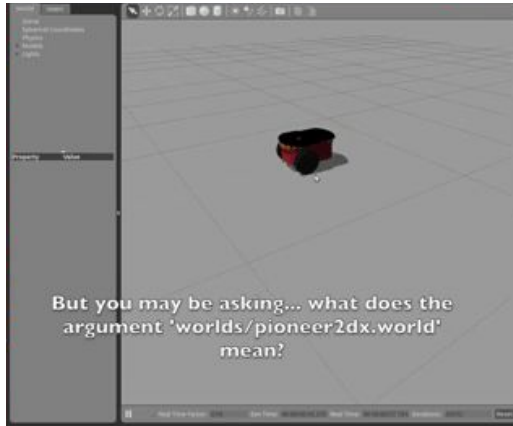


AI2-Thor

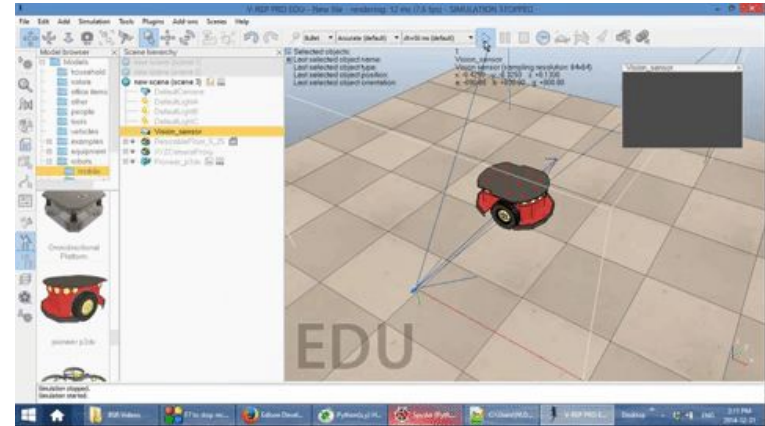


HoME / House3D

# Robots



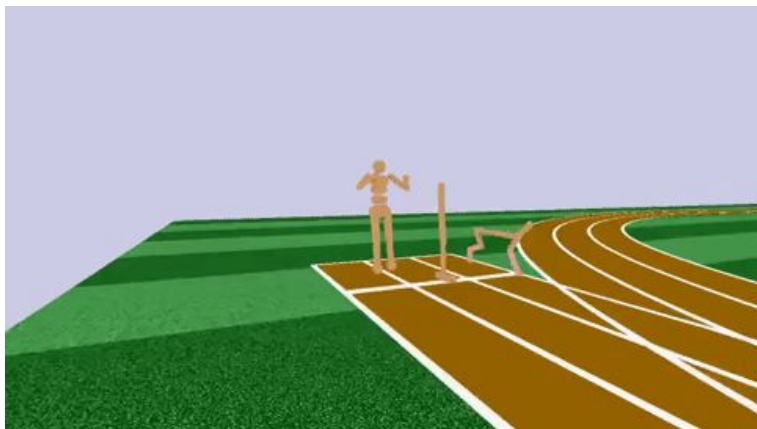
Gazebo



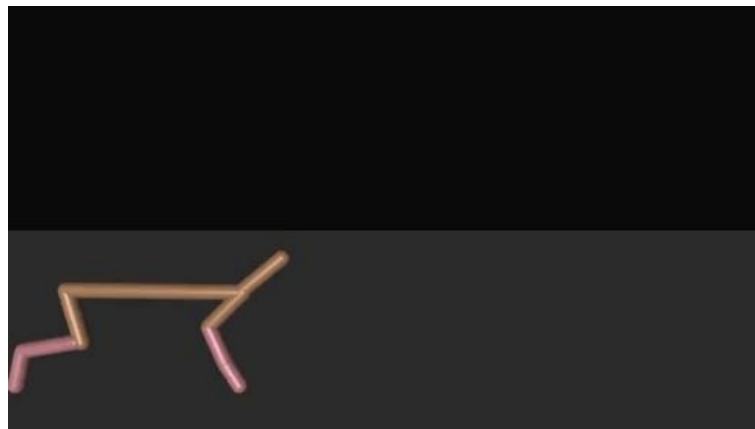
V-Rep



# Robots



PyBullet



MuJoCo





**How to choose?**

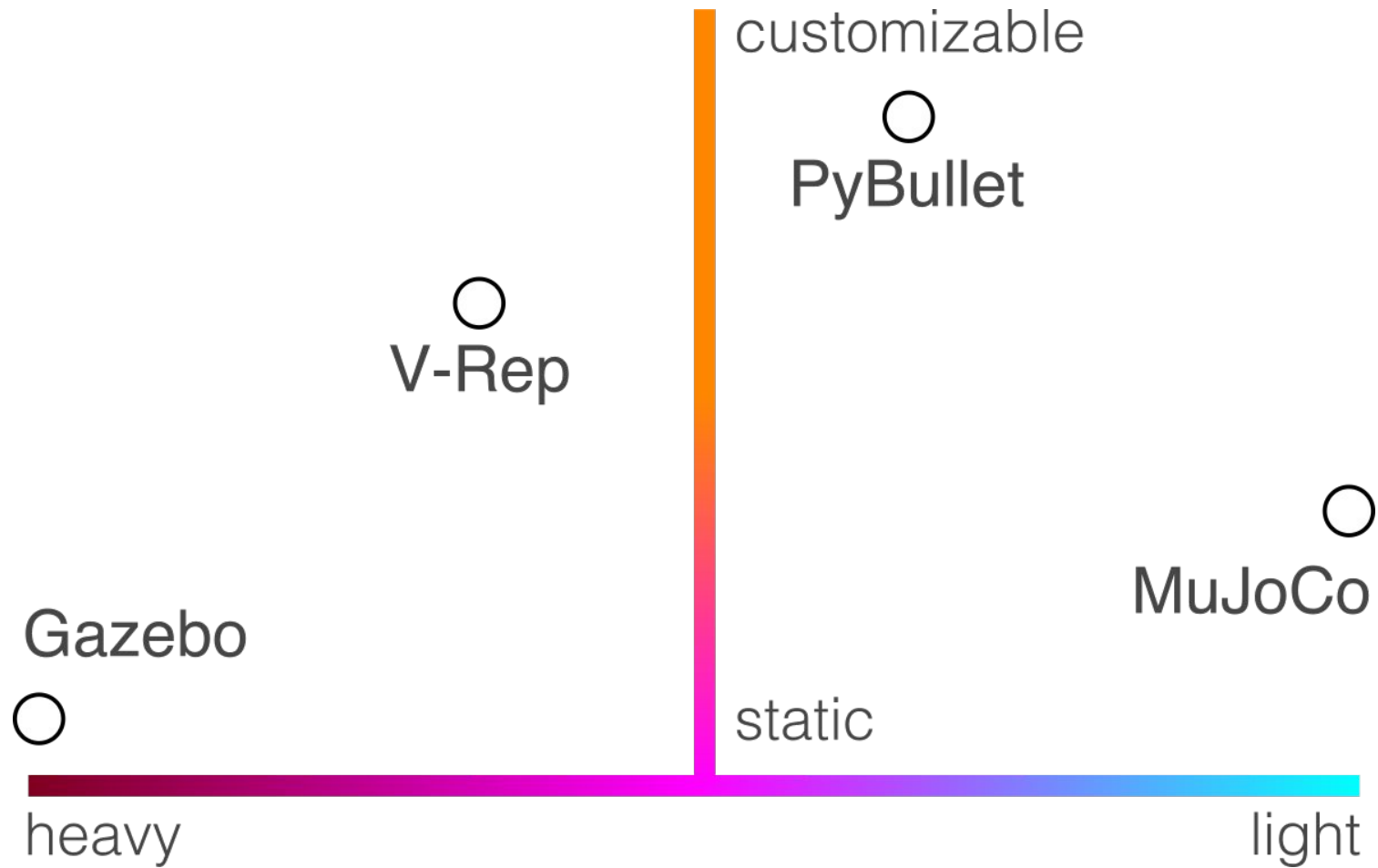
# Performance & Customizability





# Performance







**Practical**



# MuJoCo

```
1-mujoco.py x
1  import gym
2
3  env = gym.make("Reacher-v2")
4
5  env.reset()
6  env.render()
7
8  for i in range(1000):
9      action = env.action_space.sample()
10     env.step(action)
11
12     env.render()
13
```



# MuJoCo - Custom Model

Torque

Size/Color

Backlash



# Custom Gym Envs

How to: <https://github.com/openai/gym/tree/master/gym/envs>

Example: <https://github.com/fgolemo/gym-reacher2>





# V-Rep

Barebone

Or w/ wrapper: <https://github.com/fgolemo/vrepper>

Custom robot example: <https://github.com/fgolemo/gym-vrep>



# PyBullet

Custom robot example: <https://github.com/fgolemo/gym-duckietown3>