

## Appendix D User Manuals

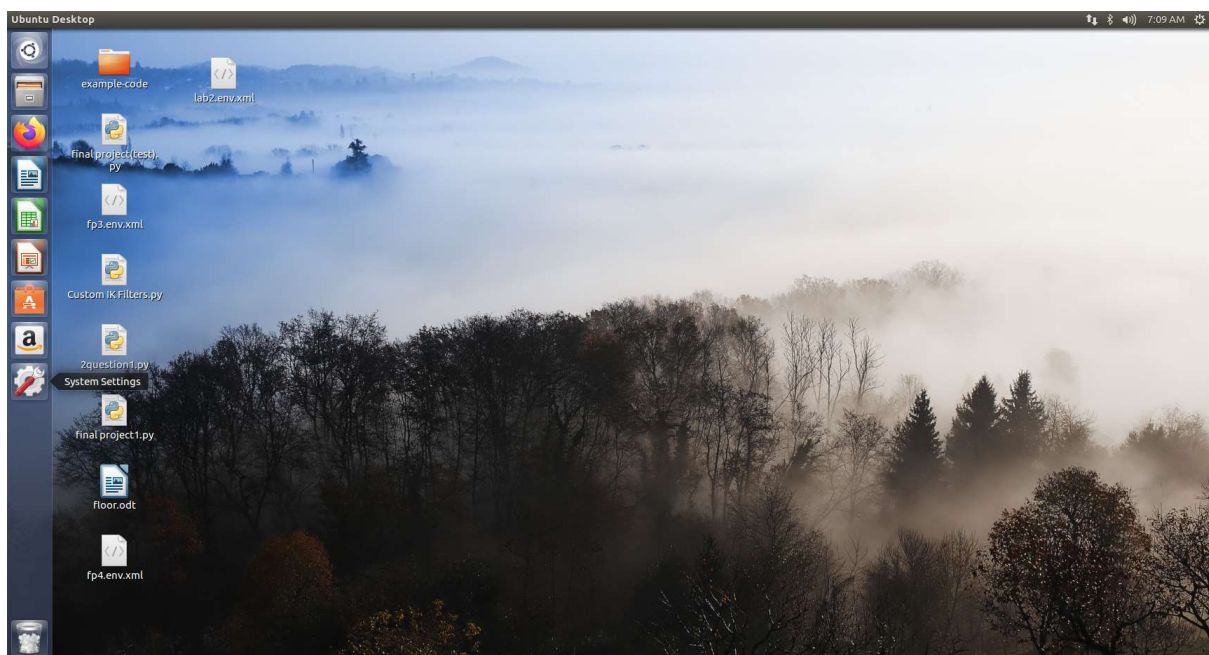
### D.1 Install VMware Workstation Pro

I use the windows system as the basis and install the virtual machine (VMware Workstation 15.5 Pro) based on windows10.

### D.2 Install Ubuntu

After installation, you need to download the “iso” file of Ubuntu (ubuntu-16.04.6-desktop-amd64.iso) and install it on the virtual machine.

After the installation is successful, we will see the following screen



**Figure D.1** Ubuntu Desktop

### D.3 Install OpenRAVE

You can install "OpenRAVE" according to the content of the following website.

Link: <https://scaron.info/teaching/installing-openrave-on-ubuntu-16.04.html>

### D.4 File Introduction

Below I will introduce the contents of all files and how to use them.

barrettwam.robot.xml: Some parameters of the robot arm (initialize the robot arm)

box1-blue.kinbody.xml: Some parameters of the box (initialize the box)

box1-green.kinbody.xml: Some parameters of the box (initialize the box)

box1-purple.kinbody.xml: Some parameters of the box (initialize the box)

box1-red.kinbody.xml: Some parameters of the box (initialize the box)

final project(Working Environment One).py: The code of the robot arm working in environment one.

final project(Working Environment Two).py: The code of the robot arm working in environment two.

fp0.env.xml: Working environment one.

fp1.env.xml: Working environment two.

## D.5 Use the Software

We take work environment one as an example, work environment two is the same operation.

Open the file: "final project(Working Environment One).py", we can see this line of code: "env.Load('fp0.env.xml') # load a simple scene".

```
env.Load('fp0.env.xml') # load a simple scene
```

**Figure D.2** Code One

The function of this line of code is to load the working environment, and the content in parentheses is the address where people store "fp0.env.xml" in the virtual machine.

Open the file: "fp0.env.xml", we can see this line of code: "<Robot file='robots/barrettwam.robot.xml' name='BarrettWAM0'>".

```
4 <Robot file="robots/barrettwam.robot.xml" name="BarrettWAM0">
```

**Figure D.3** Code Two

The function of this line of code is to load the robot arms, and the content in parentheses is the address where people store "barrettwam.robot.xml" in the virtual machine.

In the same file, we can see this line of code: "<KinBody name='mug35' file='/home/xzs/collada-dom/build/OpenSceneGraph/build/fcl/build/openrave/src/data/box1-red.kinbody.xml'>".

```
51 <KinBody name="mug35" file="/home/xzs/collada-dom/build/OpenSceneGraph/build/fc1/build/openrave/src/data/box1-red.kinbody.xml">
```

#### **Figure D.4** Code Three

The function of this line of code is to load the box, and the content in parentheses is the address where people store “box1-blue.kinbody.xml” in the virtual machine.