

Workflows

ECE 4960, Fall 2020

Workflow

In this course, the lab exercises may be broadly grouped under three types:

1. Python programming:

- **Simulation:** Program your virtual robots
- **Offboard Processing:** Offload processing to your computer by sending and receiving data to/from your real robot using the bluetooth module

2. Arduino Programming: To program the artemis board on the real robot

Workflow A

If you are not very comfortable with using Ubuntu and your VM is a bit sluggish, **this is the recommended minimal use of VM.**

HOST OS	Ubuntu VM
Arduino Programming	Simulation Programming Offboard Programming

Workflow B

In case your bluetooth module does not work with your Ubuntu VM, this is the bare-minimal use case for the VM.

HOST OS	Ubuntu VM
Offboard Programming Arduino Programming	Simulation Programming

Workflow C

If your VM is buttery smooth and you are comfortable with using Ubuntu, the **VM can serve as a one-stop shop** for all your needs! Setup Github in it and you don't even need to a shared folder with your Host OS.

HOST OS	Ubuntu VM
	Simulation Programming Offboard Programming Arduino Programming

Workflow X

- This is a workflow for students who are comfortable with a UNIX based OS, the command line interface, and have taken a painstakingly long time to perfect a custom work environment in their Host OS.
- It essentially involves the following steps:
 - a. Mount the VM's file system on your Host OS
 - b. SSH into your VM with X forwarding
 - c. Run the VM headless to reduce load on your system
- This way you can always stay in your Host OS, have access to all the files in the VM, and use X11 forwarding to get the GUI apps to show up in your Host OS

Workflow X

- Checkout the setup guide that can help you get started with this workflow:
https://cei-lab.github.io/ECE4960/tutorials/vm_ssh_setup.html
- References:
 - a. SSH into VM:
<https://unix.stackexchange.com/questions/145997/trying-to-ssh-to-local-v-m-ubuntu-with-putty>
 - b. MacOS file system mounting: <https://osxfuse.github.io/>
 - c. Running VM in headless mode:
<https://superuser.com/questions/1153939/start-a-vm-in-virtualbox-without-gui>

Virtualization Software

- We have tested the supplied Ubuntu VM in Virtualbox 6.1.14 on the following OSes:
 - Windows 10 1909
 - Mac OS 10.15.6
 - Ubuntu (18 LTS and 20 LTS)
- It should work on [VMware Player](#) (free for Linux and Windows)
- If MacOS users face issues with booting the VM, you can try a free personal version of [VMware Fusion](#)
- Check out the [Tutorials and Helpful Resources](#) section in the course website for tutorials on setting up your VM