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Path 3: Artificial Intelligence in Robotics

Manual for Installing VirtualBox, Ubuntu,
ROS

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1. Download virtual box (mac os):

- <https://www.virtualbox.org/wiki/Downloads>
- Click on OS X host
- Virtual box manager will be in your downloads folder



VirtualBox-6.0.22
-13798...OSX.dmg
138.4 MB

- Confirm the installation by writing your password and agreeing to terms & conditions



Figure 1 opening the package manager

2. Download Ubuntu

- Click on the link <https://ubuntu.com>

canonical

ubuntu® Enterprise ▾ Developer ▾ Community ▾ Download ▾

Search 

Ubuntu Desktop ›

Download Ubuntu desktop and replace your current operating system whether it's Windows or Mac OS, or run Ubuntu alongside it.

20.04 LTS

Ubuntu Server ›

The most popular server Linux in the cloud and data centre, you can rely on Ubuntu Server and its five years of guaranteed free upgrades.

20.04 LTS

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Are you a developer who wants to try snappy Ubuntu Core or classic Ubuntu on an IoT board?

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Intel NUC
KVM
Qualcomm Dragonboard 410c
UP2 IoT Grove
Intel IEI TANK 870

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Use Ubuntu optimised and certified server images on most major clouds.

Get started on Amazon AWS, Microsoft Azure, Google Cloud Platform and more...
Download cloud images for local development and testing

Figure 2 Ubuntu page

- Click on Ubuntu Desktop (20.04 LTS)
 - It will start downloading

1. Setting up ubuntu on virtual box

- Open virtual box

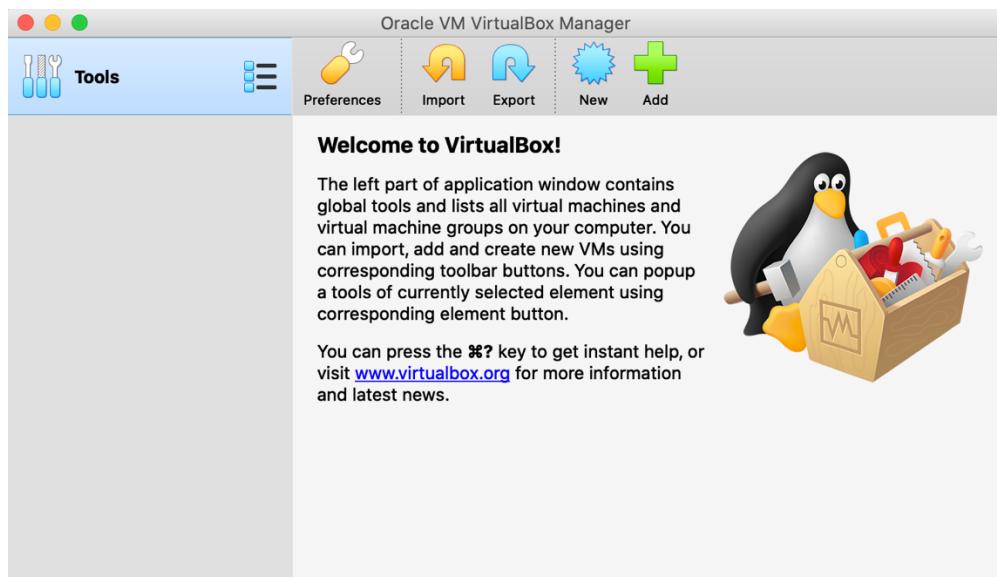


Figure 3 Virtual box main page

- Click on new
- Write the name: Ubuntu 20.04

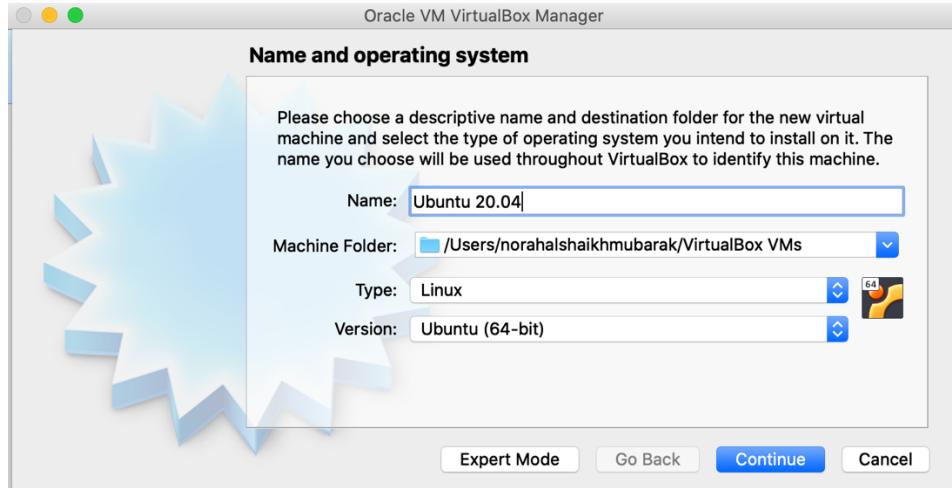


Figure 4 Name and operating system

- Click on continue
- Select memory size as allowed in your operating system

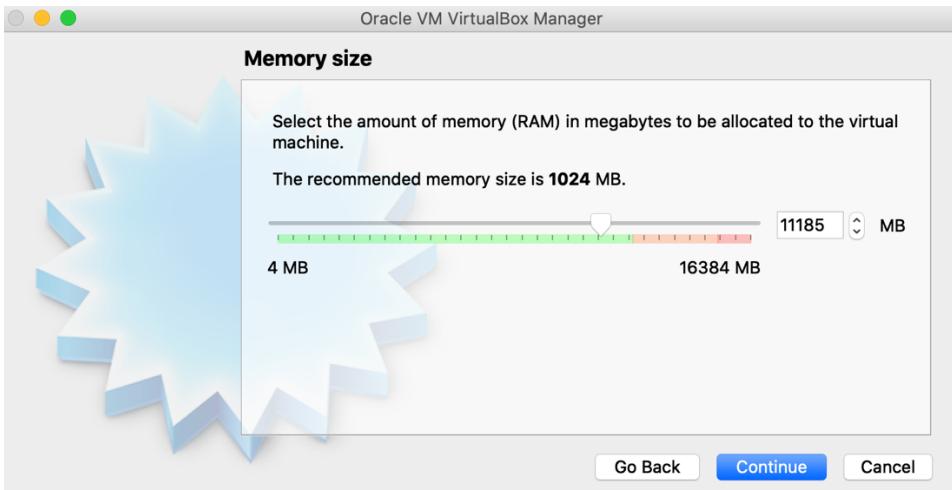


Figure 5 memory size

- Click continue

- Create a hard disk



Figure 6 Hard disk

- Click create
- Specify hard disk file type: leave it as VDI

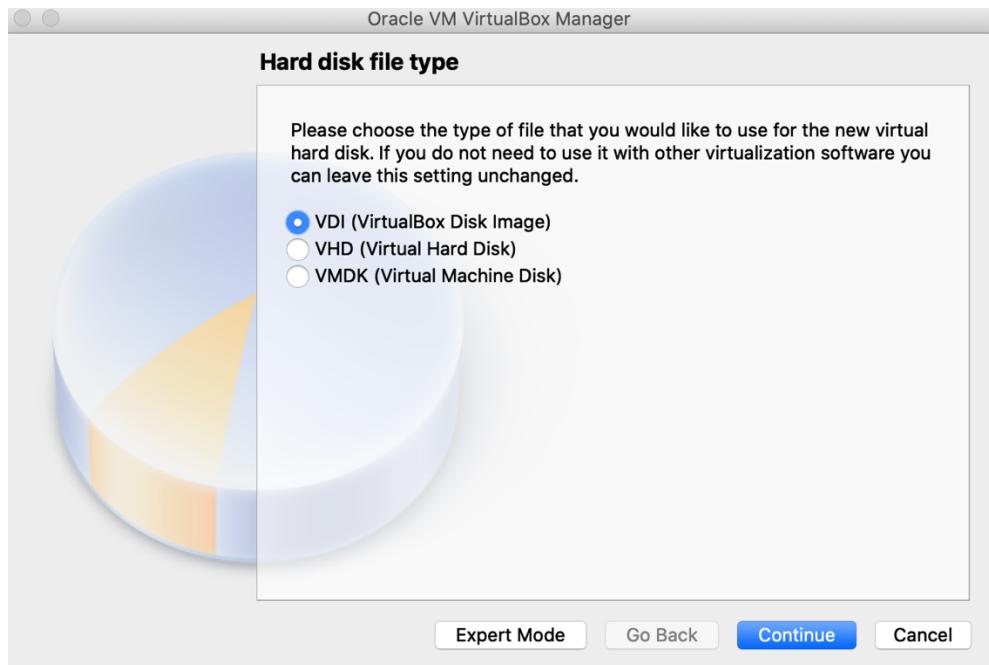


Figure 7 hard disk file type

- Click continue

- Specify storage on physical hard disk

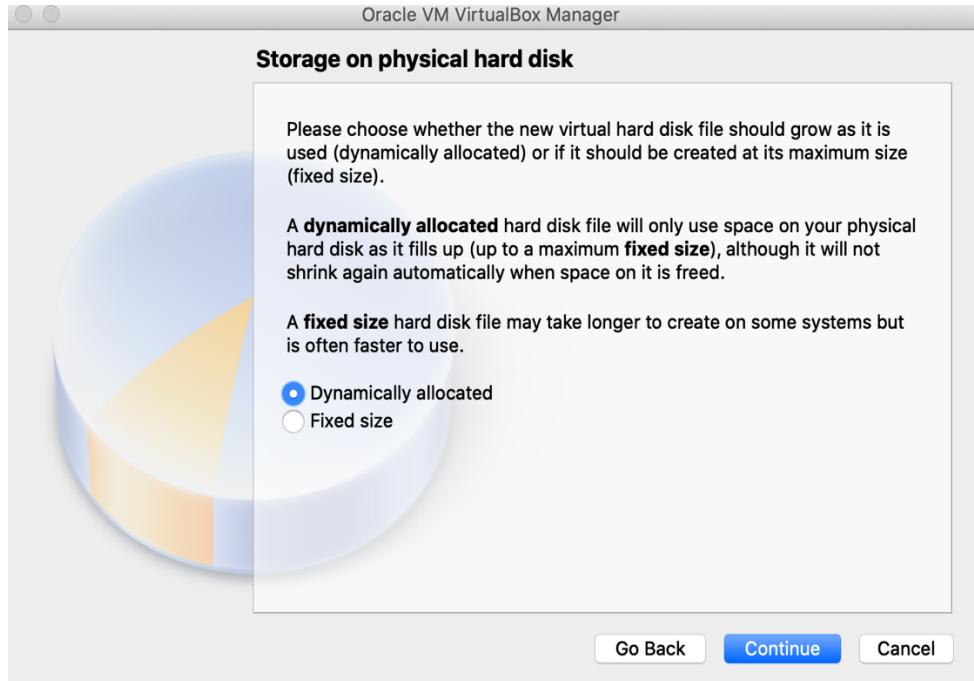


Figure 8 storage on physical hard disk

- File location and size

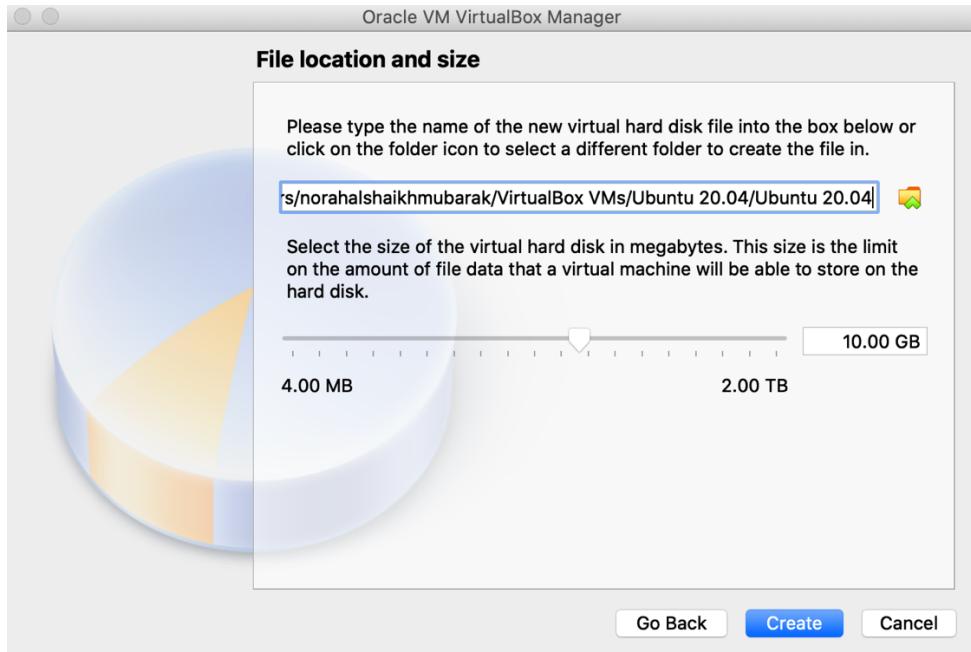


Figure 9 file location and size

- Click on create



Figure 10 ubuntu created

- Click on settings -> Advanced -> change the shared clipboard and Drag'nDrop to bidirectional to share your files between virtual box and your machine

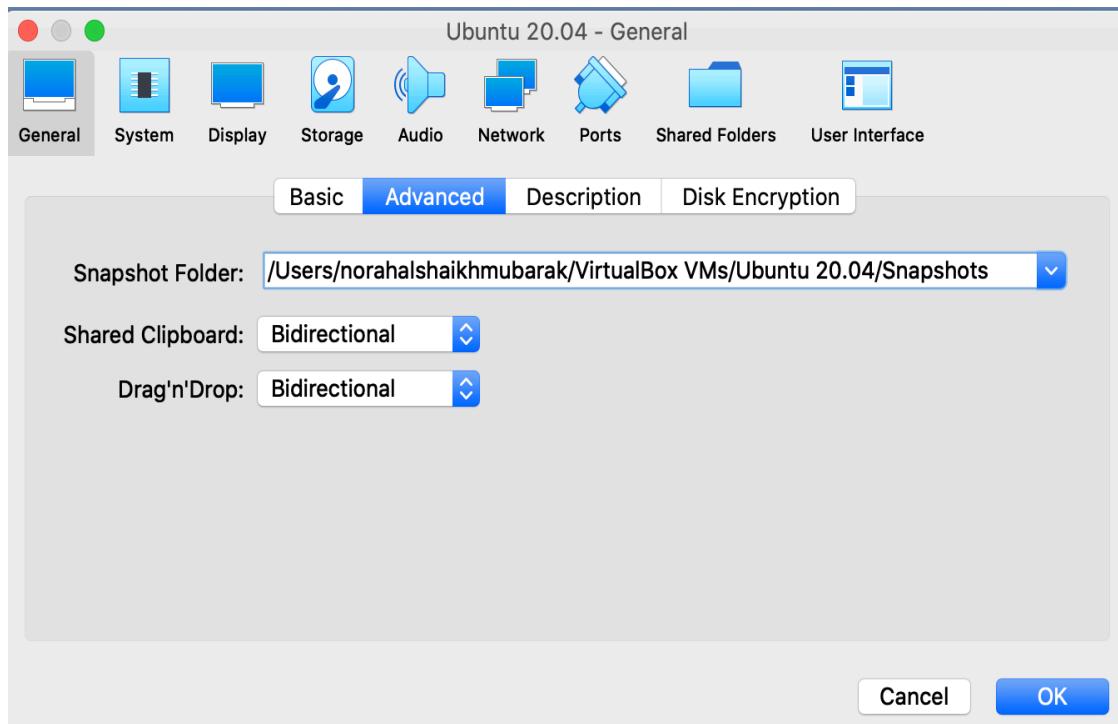


Figure 11 advanced settings

- Click on storage -> click on empty -> click on choose virtual disk file

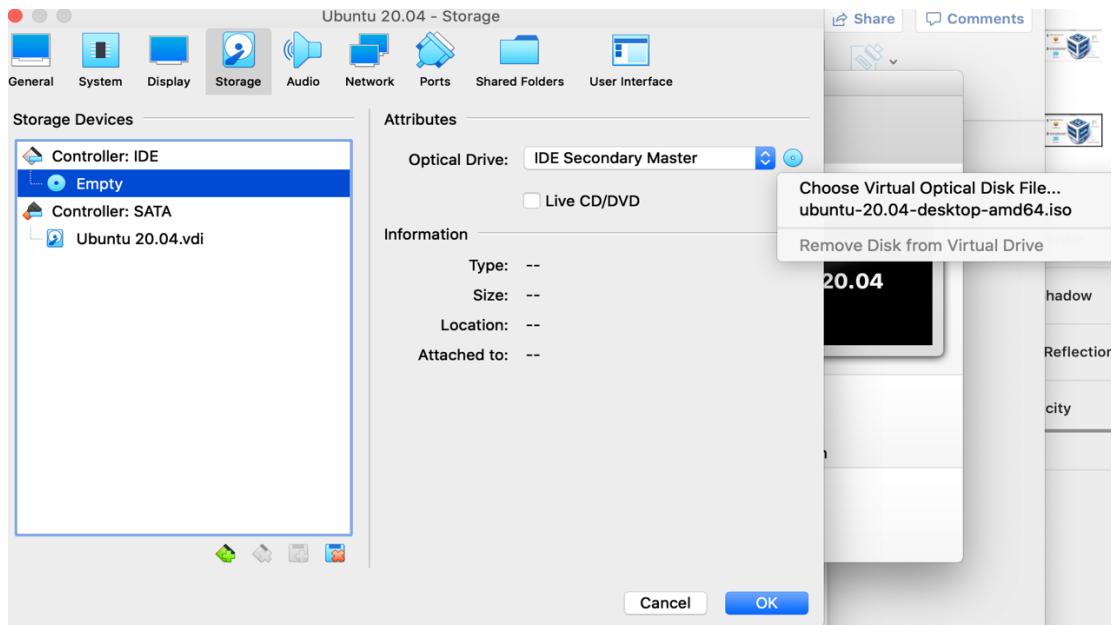


Figure 12 upload the ubuntu file

- Browse into where you have downloaded ubuntu and select it

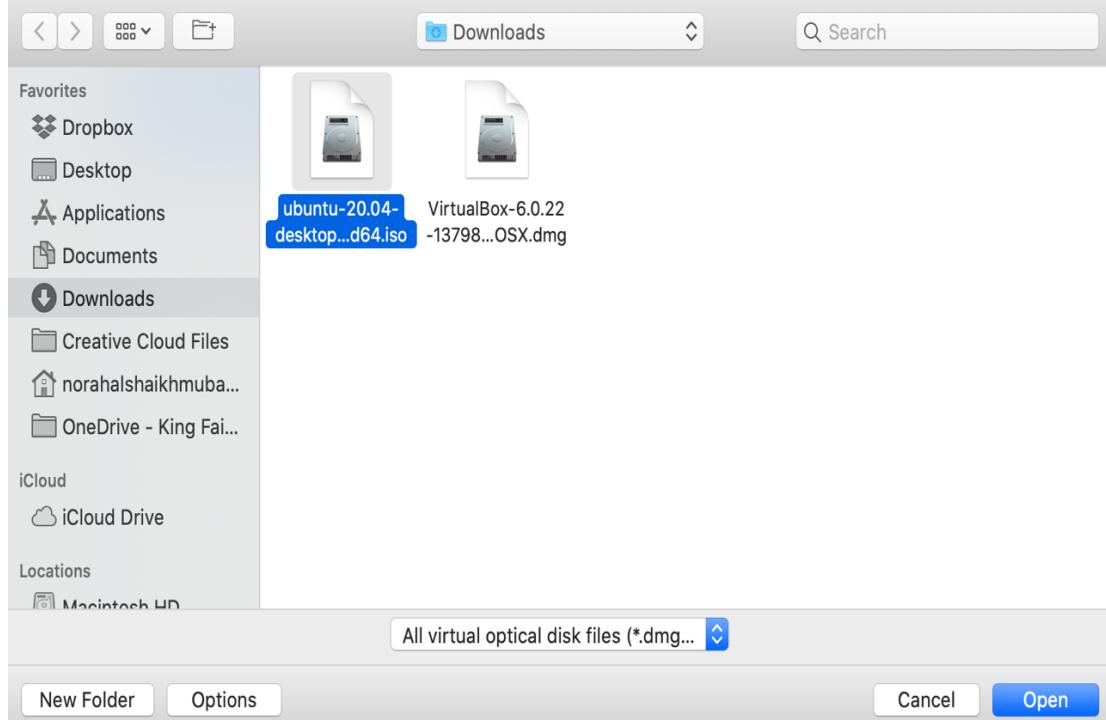


Figure 13 choose the ubuntu file

- Click Ok

- Start ubuntu
- Click on install ubuntu -> select the language -> continue
- Select all three options -> continue

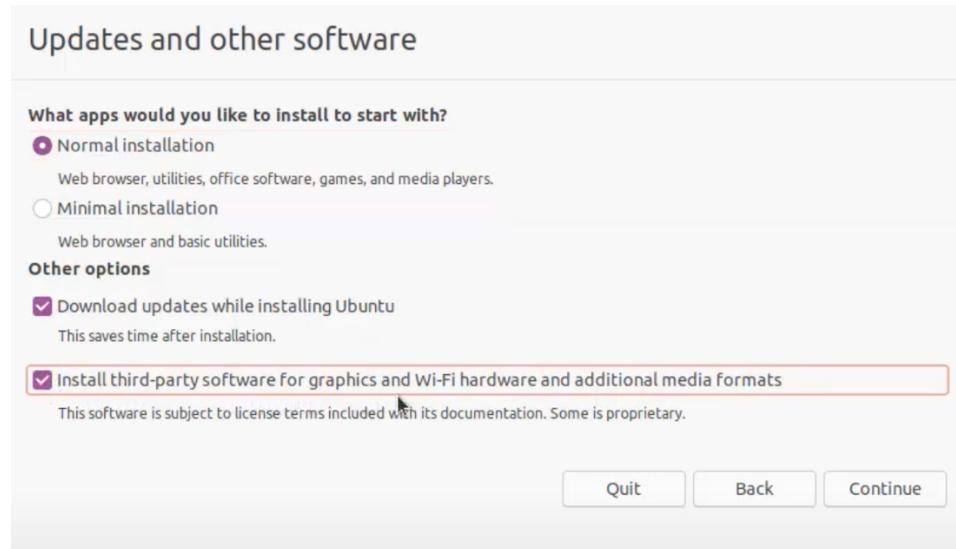


Figure 14 updates and other software specification

- Installation type specification (leave it as default) -> Install now -> continue

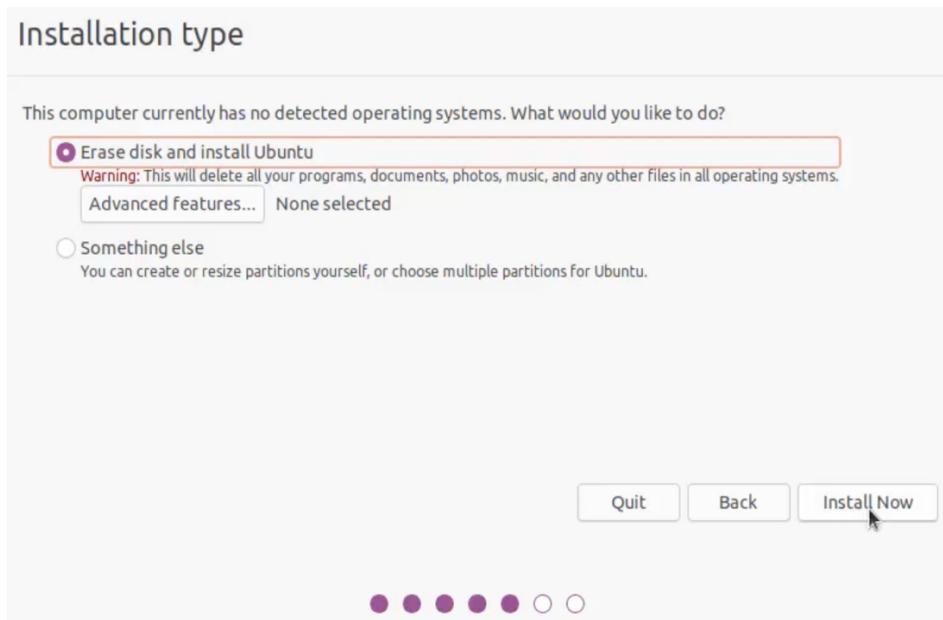


Figure 15 installation type

- Choose the default location -> continue



Figure 16 Specify the location

- Specify your name and password -> continue

Your name:

Your computer's name:
The name it uses when it talks to other computers.

Pick a username:

Choose a password:

Confirm your password:

Log in automatically
 Require my password to log in

Figure 17 specify name and password

- After installation -> click on restart now

- Press enter

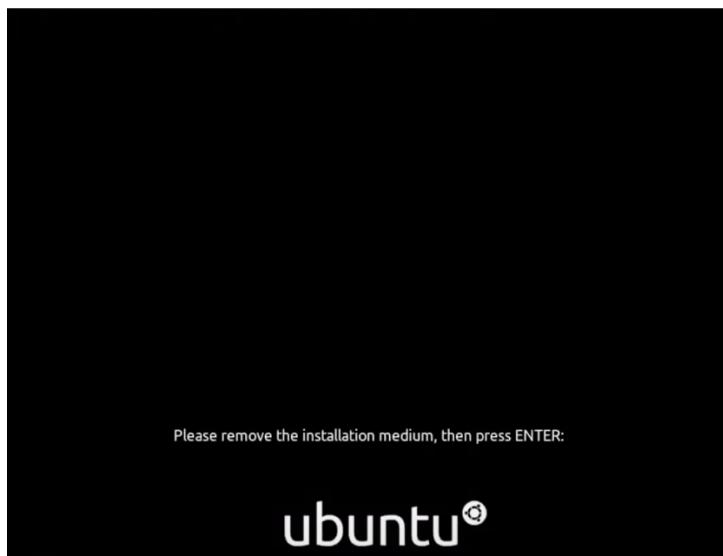


Figure 18 ubuntu restart

- Enter your password -> enter

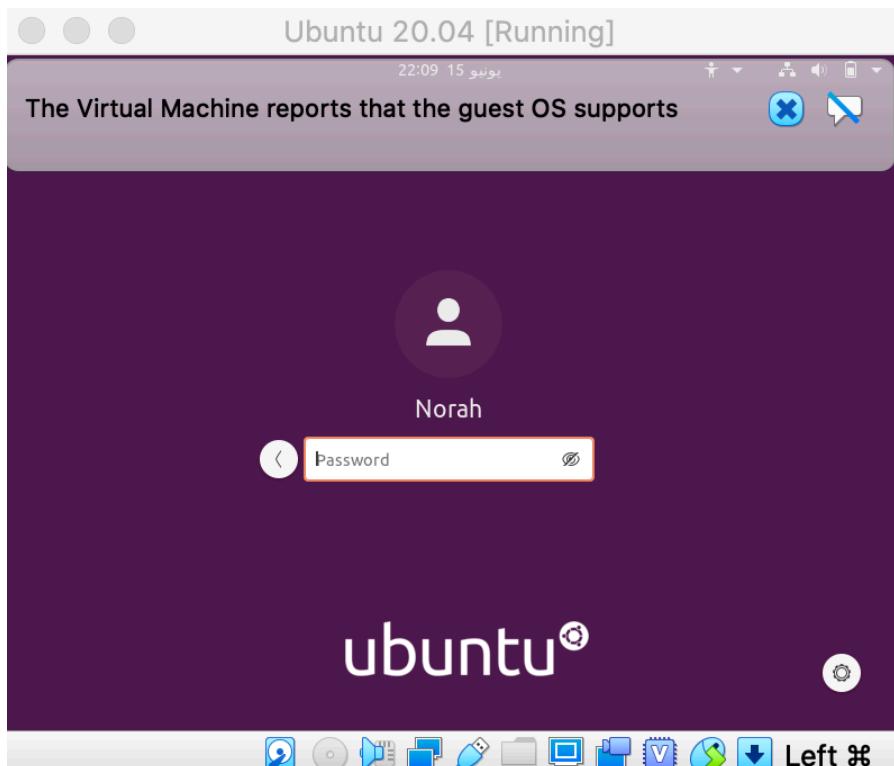


Figure 19 login into ubuntu

- Logged in to your ubuntu

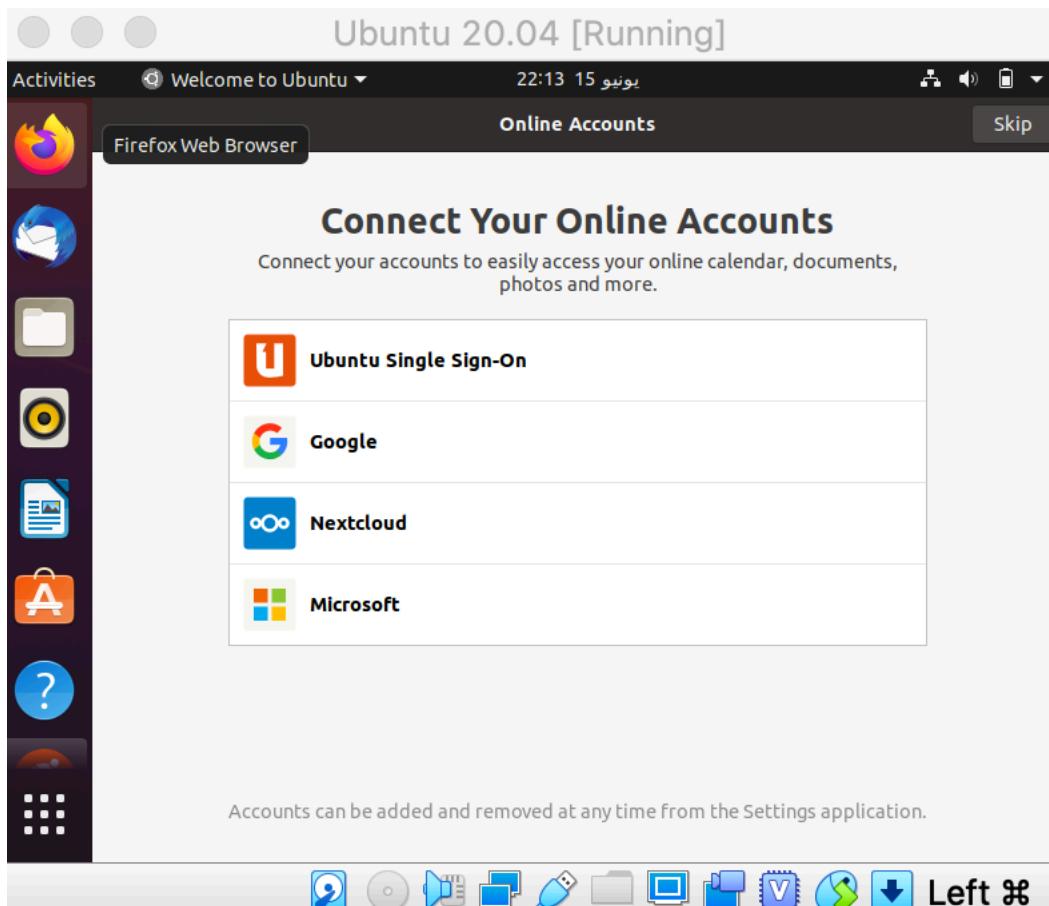
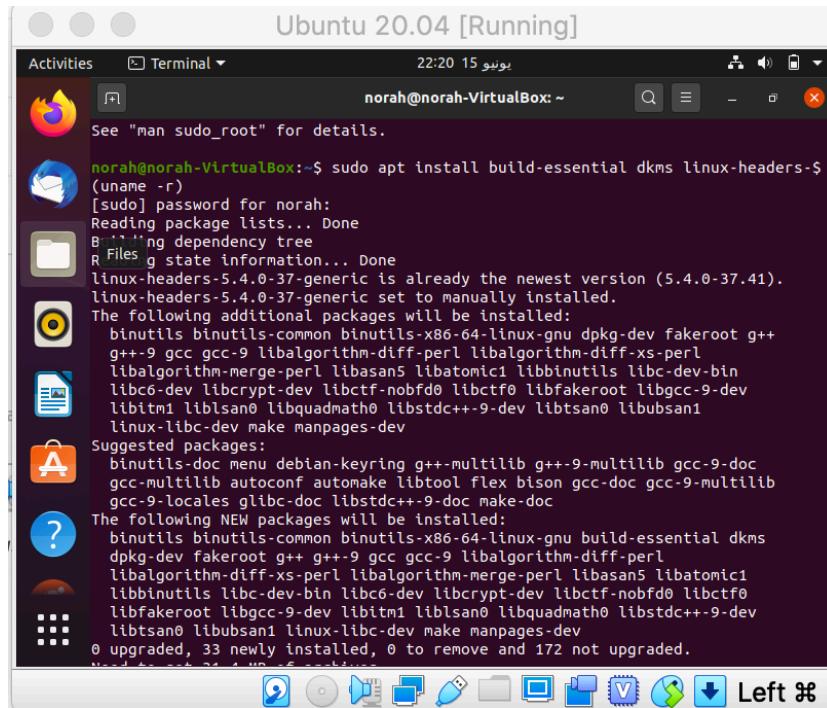


Figure 20 ubuntu home page

- (The following content is additional) in order to make the screen larger:
- Open the terminal and type: sudo apt install build-essential dkms linux-headers-\$(uname -r)
- Click: y to continue



The screenshot shows a terminal window titled "Ubuntu 20.04 [Running]". The terminal output is as follows:

```

See "man sudo_root" for details.

norah@norah-VirtualBox:~$ sudo apt install build-essential dkms linux-headers-$(uname -r)
[sudo] password for norah:
Reading package lists... Done
Building dependency tree
Reading state information... Done
linux-headers-5.4.0-37-generic is already the newest version (5.4.0-37.41).
linux-headers-5.4.0-37-generic set to manually installed.
The following additional packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu dpkg-dev fakeroot g++-9 gcc gcc-9 libalgorithm-diff-perl libalgorithm-diff-xs-perl
  libalgorithm-merge-perl libasan5 libatomic1 libbinutils libc-dev-bin
  libc6-dev libcrypt-dev libctf-nobfd0 libctf0 libfakeroot libgcc-9-dev
  libitm1 liblsan0 libquadmath0 libstdc++-9-dev libtsan0 libubsan1
  linux-libc-dev make manpages-dev
Suggested packages:
  binutils-doc menu debian-keyring g++-multilib g++-9-multilib gcc-9-doc
  gcc-multilib autoconf libtool flex bison gcc-doc gcc-9-multilib
  gcc-9-locales glibc-doc libstdc++-9-doc make-doc
The following NEW packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu build-essential dkms
  dpkg-dev fakeroot g++-9 gcc gcc-9 libalgorithm-diff-perl
  libalgorithm-diff-xs-perl libalgorithm-merge-perl libasan5 libatomic1
  libbinutils libc-dev-bin libc6-dev libcrypt-dev libctf-nobfd0 libctf0
  libfakeroot libgcc-9-dev libitm1 liblsan0 libquadmath0 libstdc++-9-dev
  libtsan0 libubsan1 linux-libc-dev make manpages-dev
0 upgraded, 33 newly installed, 0 to remove and 172 not upgraded.
Need to get 21.1 MB of archives.
All selected packages are up to date.

```

Figure 21 additional to make screen larger

- Close the terminal -> click on devices -> click on insert guest additions CD images -> run -> provide password -> authenticate

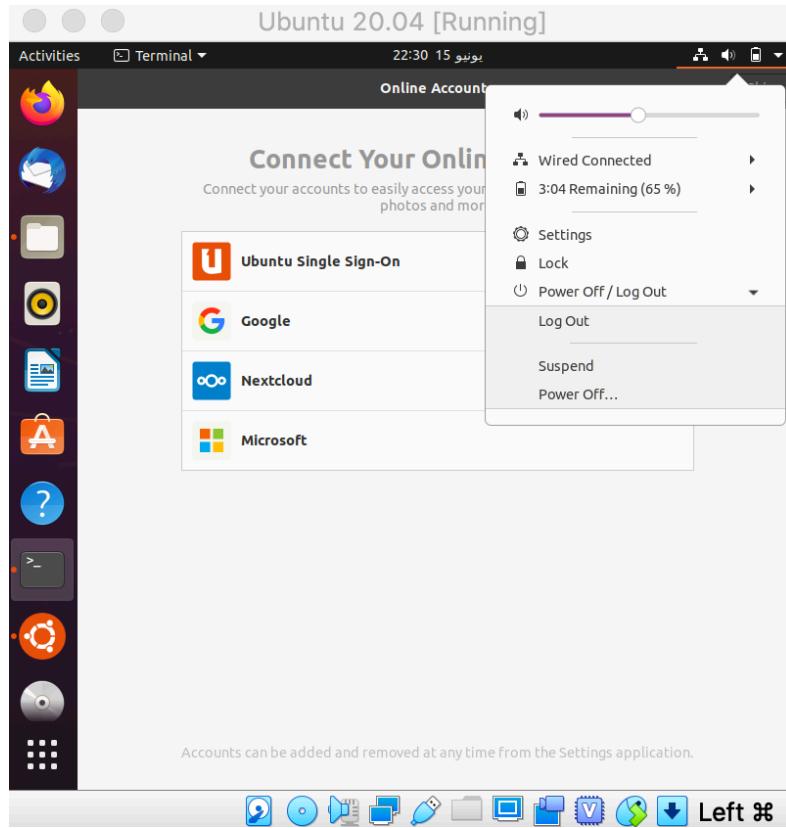


Figure 22 restart ubuntu

- Click power off -> power off
- Finally size of screen will be expanded as you like

3. Installing ROS (mac os)

- Open VirtualBox and log in into your ubuntu
- Open the terminal
- Write the command:

```
wget -c  
https://raw.githubusercontent.com/qboticslabs/ros_install_noetic/master/ros_install_noetic.sh && chmod +x ./ros_install_noetic.sh && ./ros_install_noetic.sh
```

- Enter your password

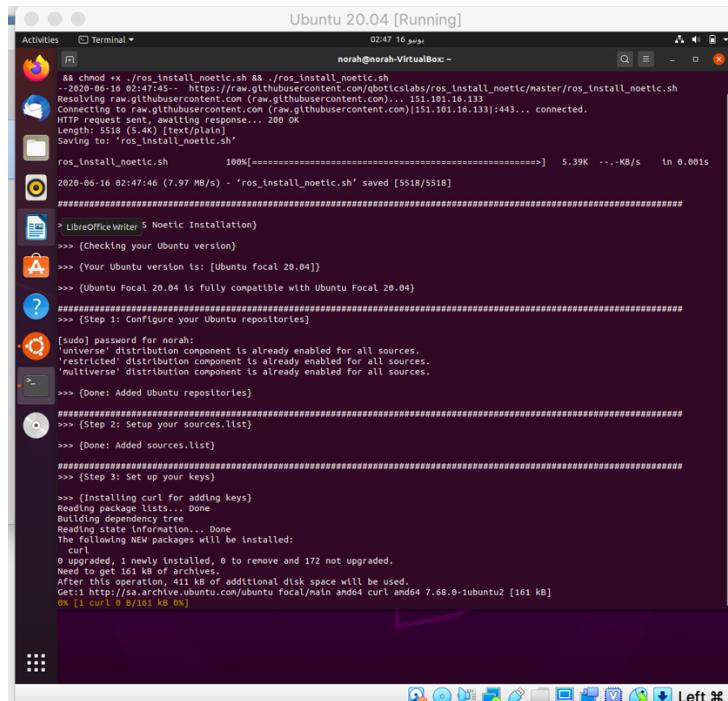


Figure 23 Terminal window with command

- Enter 1 as the default ROS installation
- After installation, Type [rosversion -d] to get the current ROS installed version

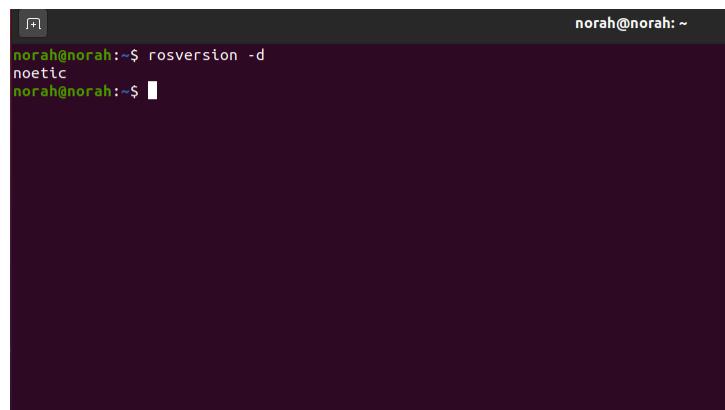


Figure 24 ROS version

References

1. <https://www.youtube.com/watch?v=x5MhydijWmc&feature=youtu.be>
2. <https://www.youtube.com/watch?v=IqrpSi2Xueg&feature=youtu.be>