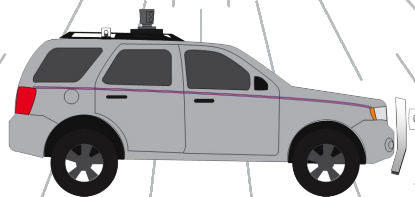# CAT VEHICLE REU Summer 2020

*Software Downloads*

Rahul Bhadani <rahulbhadani@email.ariona.edu>

# Prerequisite

❖ We will be working on Ubuntu 18.04 most of the time.

❖ Programming tools required: C++, MATLAB/Simulink, Python

❖ All work must be committed to version control: we will use github.com/jmscslgroup

  ➢ Send your github.com userID

❖ We will use latex to write reports and any papers.

❖ Make sure your system has sufficient disk space (> 100 GFB is recommended]

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# Installing Ubuntu 18.04

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# Ways to use Ubuntu

- Virtual Machine
  - VMWare Workstation
  - VMWare Player
  - VMWare Fusion for Mac
  - Oracle Virtual Box

- Linux subsystem in Windows

- Stand-alone
  - Strictly Ubuntu 18.04
  - https://releases.ubuntu.com/18.04/

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# Install VMWARE Workstation

THE UNIVERSITY OF ARIZONA

College of Engineering
IT Support

### IT Support Home Page

This is the main IT support site for the College of Engineering at the University of Arizona, Tucson. From this page, you can create or manage tickets that you have submitted. Access resources that are available to Engineering students, staff, and faculty.

There are also external links to Azure Development Tools for Teaching, formerly known as MSDN-AA licensing, and to E On The Hub website with VMWare and other applications. The are links to see what software we have available in the labs. Plus the ever popular FAQ's
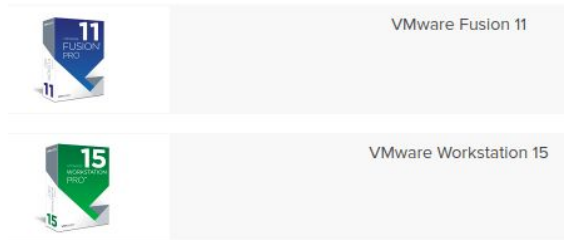
**Support Tickets**

   **My Support Tickets**
   **New Ticket**
   **FAQs**

**Software**

   **VMware and Others Web Store**
   **Azure Development Tools For Teaching( formerly know as MSDN-Licensing)**
   **Lab Software**
   **UofA Software Licensing**

- ❖ Not required if you are already using a native Ubuntu 18.04 system
- ❖ Go to https://support.engr.arizona.edu/
- ❖ Click **VMware and Others Web Store**
- ❖ You will be asked to login using your NetId
- ❖ Select VMware Workstation Player 15 for Windows or any linux machine

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# Install VMWARE Workstation

VMware Fusion 11

VMware Workstation 15

❖ Select VMware Workstation 15 for Windows or any linux machine

❖ Or VMware Fusion 11 for Mac

❖ Add to cart - > checkout

❖ Copy and save the serial number somewhere

❖ Download the software

❖ Enter serial key upon installation, if asked!

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# Install VMWARE Workstation

## University of Arizona - College of Engineering

| Product Search | 🔍 |

**Students**    Faculty/Staff

**VMware**    More Software

**Software**    eText    eLab    eLearning

### VMware Workstation 14 ▲

VMware Workstation Pro is the industry standard for running multiple operating systems as virtual machines (VMs) on a single Linux or Windows PC. IT professionals, developers and businesses who build, test or demo software for any device, platform or cloud rely on Workstation Pro.

**Choose a platform:**    Linux ▾

**VMware Workstation 14 for Linux**                                                        Free

**Available to:** Students

Workstation requires a 64-bit processor and 64-bit host operating system.
You will be able to place an order for this product again in 12 months after the initial order.
The license you will receive with this offering is valid 12 months starting with the 1st of the month the offering was ordered.

🛒 Add to Cart

# Install VMWARE Workstation

University of Arizona - College of Engineering

| Product Search | 🔍 |
|---|---|

**Students**   Faculty/Staff

## Details (Order Number: 100611207398)

## Downloads

VMware Workstation 14 for Linux - Download

ⓘ Serial Number: XXXXX-XXXXX-XXXXX-XXXXX-XXXXX

**Download**

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# VMWARE - Alternative options

❖ If your U of A license is still not active, you can use free version of VMWare player: https://my.vmware.com/en/web/vmware/free#desktop_end_user_computing/vmware_workstation_player/15_0

# Obtaining Ubuntu 18.04

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# Ubuntu 18.04

- Ubuntu 18.04 can be downloaded from https://releases.ubuntu.com/bionic/. Choose 64-bit PC (AMD64) desktop image. Clicking the link on Ubuntu page will download an iso file.

- Once you install the VMWare Player or Fusion, you will need to restart the system. Additionally, you will need to enable VT-X virtualization through BIOS Boot menu. Every system (Lenovo, HP, DELL, etc.) has different ways to do, hence it is not possible to include those instructions here. Please look up online on how to do that for your system.

- Once VT-X virtualization is enabled, start your VMWare Player or Fusion, and follow the steps in the video https://youtu.be/lIhRkea8LpA to create a Ubuntu Virtual Machine.

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# Installing ROS in a new system

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# Install ROS Melodic

❖ Follow the steps mentioned in
http://wiki.ros.org/melodic/Installation/Ubuntu%C2%A0 to install ros in your new system.

❖ For CAT Vehicle development, we will require more packages.

❖ Install these packages:
sudo apt-get install ros-melodic-controller-manager -y
sudo apt-get install ros-melodic-ros-control ros-melodic-ros-controllers -y
sudo apt-get install ros-melodic-gazebo-ros-control -y
sudo apt-get install ros-melodic-image-transport-* -y
sudo apt-get install ros-melodic-joystick-drivers -y

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# Configuring ROS for your system

❖ When you are using ROS in a shared network, it is required that your ubuntu hostname is unique to avoid name-resolution conflict.

❖ Change the hostname from catvehicle to your favorite hostname  in /etc/hostname folder. E.g. You can choose your UofA netId.

> sudo gedit /etc/hostname

❖ We will also change the name of localhost to refer your computer.

> sudo gedit /etc/hosts

> and replace  catvehicle with your netId.

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# Configuring ROS for your system

❖ In <mark>.bashrc</mark> file set the hostname for ROS_HOSTNAME to the same name you used for system hostname.

➢ gedit ~/.bashrc

➢ E.g. If you have set machine's hostname to firstnamelastname, then in .bashrc file, set the ROS_HOSTNAME to firstnamelastname.

➢ Search ROS_HOSTNAME in the file .bashrc and change export ROS_HOSTNAME=reu.local to

export ROS_HOSTNAME=firstnamelastname.local

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# Installing MATLAB

# Download MATLAB

❖ In order to download MATLAB, you need to sign up to a MATLAB account with your official University of Arizona email id (aka CATMAIL). After signing in with your U of A email id, download MATLAB installer for MATLAB R2020b.

❖ Once you install matlab, you need to add an alias in .bashrc for easy access to MATLAB
   ➢ alias matlab="/usr/local/MATLAB/R2020b/bin/matlab"

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# Configuring ROS for your system

❖    To run roscore on the local machine,  change

export ROS_MASTER_URI=http://catvehicle.local:11311/

to

export ROS_MASTER_URI=http://firstnamelastname.local:11311/

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# Development IDE

- Preferred: Visual Studio Code
- Anaconda/VirtualEnv for Python
- Github Desktop
- Meld Diff Tool

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