## Matlab Setup

1. Download from this link, Select most recent version: [Purdue University - MATLAB & Simulink (mathworks.com)](https://www.mathworks.com/academia/tah-portal/purdue-university-31484706.html)
2. During the download, make sure the following are checked:
   1. Vehicle Dynamics Block set
   2. Simscape Driveline
   3. Powertrain Block set
   4. Matlab Coder
   5. Embedded Coder
   6. Coder for Cortex M
   7. Simulink Coder
   8. mex -setup -client engine [C] to configure default compiler for c code, follow directions if error arises
   9. QEMU

## Running Simulation

1. Open ‘VehicleControllerFiles.prj’
2. Wait until mode opens
3. Run it

## Code Generation

Example: [Coder Summit: How to Generate Production Code in 5 Minutes Video - MATLAB & Simulink (mathworks.com)](https://www.mathworks.com/videos/coder-summit-2018-how-to-generate-production-code-in-5-minutes--1522057622892.html)

1. Click APPs with at the top ribbon of the Simulink file
2. Select embedded coder (if you don’t see this, you didn’t download all the stuff)
3. C Code tab opens up on top ribbon, select quick start
4. In system, select subsystem, wait until menu loads & select ‘Electronics’
5. Select C code, single instance
6. Clicking through, the deployment should detect a single sample rate (0.015)
7. In word size, select arm compatible, ARM cortex-M. Have not yet determined if number of bit parameters are correct
8. In optimization, choose execution efficiency
9. Click through & generate code

## Sweeping

1. To adjust gear ratio, set the variable gr to what you want it to be. gr is a 1x4 matrix
2. To adjust the number of motors, set power\_loss\_limit to what you want it to be. power\_loss\_limit is a Simulink parameter. Use the following command to have the 2 rear motor enabled. There is no need to change any other parameter to enable/disable a motor(s).

power\_loss\_limit = Simulink.Parameter([0, 0, 1800, 1800]);