**Setting Up the Viper Lab Systems**

1. First, ensure that all systems are on.
   1. For the Yaskawa SIA20F, flip on the wall breaker and then the switch on the FS100 controller. On the Yaskawa teach pendant, follow on-screen directions to connect to the controller and then flip the key in the top left-hand corner to “Remote” mode.
   2. For the UR10, hit the power button on the teach pendant. Once the system boots up, go to the Initialization screen and press “On” and then “Start”. You should hear the brake releases. Load the program “**ros\_control.urp**” in the “Load Program” menu.
   3. For the OptiTrack, have the Windows CPU on and the Motive software up and running. The cameras around Hopper 26 should all have a blue ring glowing around the lens.
      1. On the Motive interface, make sure the cameras are tracking any objects you want to see. If the software doesn’t automatically pick them up, walk around the vision capture area to cause some disturbance or move your object to a different location.
   4. With all systems on, you can run the startup command and begin interacting with the systems.
2. On the Linux CPU run one of the following commands (A or B):
   1. **roslaunch viper\_lab system.launch**
      1. Initializes robots with original trajectory wrappers that have a 5 second buffer between each waypoint sent to them.
   2. **roslaunch viper\_lab realTimeSystem.launch**
      1. Initializes robots with trajectory wrappers that do not have the 5 second buffer. Must be careful when sending full trajectories and even a single waypoint.
   3. This will initialize all three systems from Step 1.
3. With the hardware on and the launch file running successfully, navigate to the UR10 teach pendant. With the correct program running (Step 1.B), hit the play button in the bottom left hand of the screen. If this works correctly, the Linux terminal window that’s running the launch file should say **“Robot connected to reverse interface. Ready to receive control commands.”**
4. Open MATLAB and navigate to the ViperCode folder that lives in the USNA\_YASKAWA\_ROS\_MATLAB repository. Run the following script or simply create robot classes in your own script. All class information can be found in the Viper Lab MATLAB folder.
   1. **SCRIPT\_MultiSystemStart.m**
   2. This will initialize all three systems in MATLAB and allow you to easily interface them.