NMSM Pipeline Installation Instructions

Matlab

Download and install Matlab R2024a or newer along with the following toolboxes:

- Curve Fitting
- Optimization
- Parallel Computing
- Signal Processing
- Statistics and Machine Learning
- Symbolic Math

OpenSim

1. Download and install OpenSim 4.5 or newer.
2. After OpenSim is installed, configure MATLAB to work with OpenSim. Follow the instructions under "Setting up your Matlab Scripting Environment." Note the additional step required if you are installing on a Windows computer.

GPOPS-II (required for Treatment Optimization)

1. Obtain a license and download the GPOPS-II direct collocation optimal control software from the GPOPS-II website.
2. Install GPOPS-II as indicated in the GPOPS-II installation instructions.
3. Open MATLAB and navigate to your GPOPS-II folder.
4. Run the following command in the MATLAB command window:
   >> gpopsMatlabPathSetup
   Once the script has finished updating the MATLAB path, run the following command in the MATLAB command window:
   >> gpops2License
   and verify that GPOPS-II License Information outputs to your screen.
5. (Windows only) In your GPOPS-II installation, go to the 'ipopt' folder (GPOPS-II\nlp\ipopt). There should be a file called 'ipopt.mexw64'. Replace this file with the version of 'ipopt.mexw64' in this distribution. GPOPS-II will not work with the required versions of Matlab on Windows without this change.
6. (Mac only) If necessary, remove the quarantine attribute from the ipopt MEX file using the following steps:
   - Open a Terminal window.
   - Change directories to the ipopt folder within the GPOPS-II-Distribution folder
   - Run the following command: xattr -d com.apple.quarantine ipopt.mexmaci64

NMSM Pipeline

1. Go to the NMSM Pipeline project on Simtk.org.
2. Select "Download Latest Releases" -> **NMSM Pipeline:** nmsm_core-1.4.zip
3. Unzip the files to a desired location.
4. In MATLAB, navigate to the folder where you installed nmsm-core.
5. Double click on the project file Project.prj to set up your environment. **Note that you will have to double-click on this file every time you close and re-open Matlab if you want to continue using the NMSM Pipeline.**
6. Minimize (but do not close) the window "Project – project". If you close this window, you will no longer be able to access the NMSM Pipeline in your MATLAB session.
7. Select "Download Latest Releases" -> **NMSM Tutorials:** nmsm_tutorial-1.3.2.zip
8. Unzip the nmsm-tutorial files to the same location where you installed the nmsm-core files.

NMSM Pipeline GUI (Windows with OpenSim 4.5 only)

1. Navigate to “nmsm-core\gui”. This folder contains the org-opensim-rcnl.jar and rcnlPlugin.dll files.
2. Copy rcnl-plugin.dll to a folder named “plugins” in your OpenSim installation directory. The installation directory likely has a path like “C:\OpenSim 4.5”. If there is no folder named “plugins”, create one.
3. Open a Powershell window in your OpenSim installation directory.
4. Run the command “opensim64 --reload {path to org-opensim-rcnl.jar}”. This file directory cannot have any spaces in it, and the path must be an absolute file path.
5. Upon starting OpenSim, expand the “User Plugins” field under “Tools”, and click on “rcnlPlugin.dll” to load the plugin. This needs to be done every time OpenSim is opened.
6. The NMSM Pipeline GUI tools will appear under the same “Tools” section.

We recommend running the NMSM Tutorials available with the NMSM Pipeline first to make sure your installation works correctly and to review how tools are used.