

MPCTools: Nonlinear Model Predictive Control Tools for CasADi (Python Interface)

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Availability

The most recent release of MPCTools is available for download from the Downloads section. Choose the appropriate version for Python 2 or 3. The development sources are hosted in a Mercurial repository on Bitbucket.

Installation

To use MPCTools, you will need a recent versions of

- Python 3.5+ or 2.7 (see below for Python 2.7 support)
- Numpy
- Scipy
- Matplotlib
- Tkinter (only needed for *_mpcsim.py examples)
- CasADi (Version ≥ 3.0 ; [download here](#))

With these packages installed, MPCTools can be downloaded from the downloads section, and the `mpctools` folder can be manually placed in the user's Python path, or the provided setup script `mpctoolssetup.py` can be used, e.g.,

```
python3 mpctoolssetup.py install --user
```

to install for the current user only, or

```
sudo python3 mpctoolssetup.py install
```

to install systemwide. Note that in these commands, you should use the appropriate `python` command for the version you downloaded, i.e., `python3` or `python2`.

Code is used by importing `mpctools` within python scripts. See sample files for complete examples.

Python 2.7 Support

In older versions of MPCTools, source files were written to be compatible with Python 2.7, and Python 3 versions were automatically generated using Python's `2to3` conversion utility. However, as of version 2.4, these roles are reversed. That is, the source files for MPCTools and the example files are now written to be compatible with Python 3.5+, and Python 2 versions are generated automatically. The code has been written so as to require only a minimal set of changes for Python 2.7 compatibility, but please report any bugs that you find.

For normal users who use MPCTools via the downloads link, this change should be completely transparent, and you can continue to update MPCTools by re-downloading the appropriate `.zip` file. However, for advanced users who may be using MPCTools directly from a clone of the repository, you will need to either start using Python 3, or you will have to switch to using `.zip` files from the downloads section.

Finally, note that Python 2.7 end of life is January 1st, 2020. After this point, Python 2.7 will no longer be supported by the Python developers. At or before this date, we will stop releasing Python 2 versions of MPCTools, so you should make plans to upgrade in the near future.

Documentation

Documentation for MPCTools is included in each function. We also provide a cheatsheet (`doc/cheatsheet.pdf`). See sample files for complete examples.

Citing MPCTools

Because MPCTools is primarily an interface to CasADi, you should cite CasADi as described on its website. In addition, you can cite MPCTools as

- Risbeck, M.J., Rawlings, J.B., 2015. MPCTools: Nonlinear model predictive control tools for CasADi (Python interface). <https://bitbucket.org/rawlings-group/mpc-tools-casadi>.

Bugs

Questions, comments, bug reports can be posted on the issue tracker on Bitbucket.

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