GILC - GENERIC ITERATIVE LEARNING CONTROL FOR NONLINEAR SYSTEMS

INTRODUCTION

gILC is open source software, written in Python, for a generic approach to iterative learning control (ILC) for nonlinear systems. Iterative learning control is a strategy for the open loop control of dynamic systems that need to perform a given task repeatedly. Its aim is to reject repeating disturbances and improve tracking control by using information about the tracking performance of the previous trial. gILC allows the user to tune the algorithm in a wide range of settings with minimal coding effort. It has excellent computational efficiency, even for long control tasks, and therefore reduces the required calculation time between trials.

INSTALLATION

gILC can be installed in Linux or Windows, and requires only a working Python installation. The software makes use of 2 third-party software packages, for which the source code is either bundled with gILC or automatically downloaded during installation. These packages are:

› IPOPT: a software package for large-scale nonlinear optimization

› CasADi: implementing automatic differentiation by means of a hybrid symbolic/numeric approach

Installation in Linux

An install script has been created for Ubuntu versions 11.04 and higher to facilitate installation. Please follow these steps:

› Download the compressed file gILC_linux.tar.gz and extract it

› Open a terminal and go into the extracted gILC folder

› Run the installation script by typing ./install_gilc.sh. You will be asked for your root password during installation. Instructions on how to build gILC and its dependancies from source with advanced settings are included in the user's manual.

Installation in Windows

gILC requires a working Python installation, including numpy and scipy. A good software package for windows that includes everything you need in order to use Python in a scientific environment isPython(x,y). To install the gILC package follow these instructions:

› Download the compressed file gILC_windows.zip and extract it

› Copy the contents of the folder source (only the contents, not the folder itself) to the folder for external packages for your Python installation, for example C:\Python27\Lib\site-packages.

TUTORIALS AND DOCUMENTATION

Several tutorials, which show the usage of the gILC package, are included in the Tutorials folder. Detailed instructions and description of the tutorials can be found in the user manual, which is also in the main gILC folder.

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