StimSeq

This repo is destined to hold code and documentation for a project made for a team of researcher at the CNRS of Paris Saclay.

Its purpose is to allow the generation of stimulation sequence using a NIDAQ USB-6001

Installing StimSeq

- Download latest release on the right of this page.
- Extract the archive to where you want pipreq to be installed
- Run the script `setup_env.bat` to setup The environment for StimSeq

Running StimSeq

To run stimseq, multiple options are possible.

From batch file

- Double click on `start_stimseq.bat`
- Select the sequence file from the popup Window

From PowerShell

After opening a shell and going to the installation directory of StimSeq :

```
.\.env\Scripts\Activate.ps1
python .\stimseq.py --path <path_to_sequence_file>
```

You can also use `python .\stimseq.py --help` to display more informations on usage.

From a Python Script

```
from stimseq import StimSeq

stimseq = StimSeq(path_to_sequence=".\sequence.csv")

stimseq.run_sequence()
```

Expected DAQ Configuration

StimSeq expects the following DAQ configuration:

- Device named "Dev1" in NI MAX software
- Valves connected on P0.1 to P0.7
- LED connected on AO0
- PIEZO connected on P1.0
- TTL Input on P2.0

Sequence file

A template can be found in the release in this repo under the name : sequence_template.csv

Development Environment

Windows

- Install Git
- Clone this git repo
- Install Python 3.12 or above

To setup the Python environment you must run the following commands from the directory where the repo is cloned. Using PowerShell.

```
python -m venv .env
.\.env\Scripts\Activate.ps1
pip install -r requirements.txt
python -m nidaqmx installdriver
```

Ubuntu 22.04

- Install Git
- Clone this git repo
- Install Python 3.12 or above

To setup the Python environment you must run the following commands from the directory where the repo is cloned. Using the terminal.

```
python -m venv .env
./.env/Scripts/activate
pip install -r requirements.txt
python -m nidaqmx installdriver
```

Requirement file

The file `requirements.txt` contains the information needed to setup the Python environment for this project. It is generated by running the command `pip freeze > requirements.txt` after activating the virtual environment. Note that the file generated this way will contain every single python package installed with `pip` even those not used by the project, so one should always review the generated file.

Ressources

External Documentation

- NIdaqmx python package
- Using NI-DAQmx in Text Based Programming Environments
- USB-6001 Specifications
- TCS SP8 MP Multiphoton Microscope
- AOD Scope Vitro
- Valvelink
- LEICA Triggerbox
- SDG 1032X
- LED Driver Thorlab LEDD1B

- ValveLink 8.2 pinout

Requirements

- NI driver
- git
- python 3.12