
expipe-plugin-cinpla Documentation

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Expipe is a python module for neuroscientific data analysis.

1.1 Windows

Download and install [Atom](#) Download and install [Anaconda](#) Download and install [Github desktop](#)

In CINPLA on windows, we recommend to put all expipe related software in

`c:\apps\.`

1.2 General

We recommend installing the expipe dev package found at <https://github.com/CINPLA/expipe-dev>, clone with your favorite git software, on the command line write:

```
$ git clone https://github.com/CINPLA/expipe-dev.git
```

Due to dependency issues we have to make two separate environments, one for phy and one for expipe with browsers. These environments will hopefully be possible to merge in the near future.

In short, install an expipe environment with browsers, and a phy environment for spikesorting, remember that you can not copy paste everything in to the command line and press enter - copy paste and press enter on one by one line:

```
cd c:\apps\expipe-dev
conda env create -f expipe-environment.yml
activate expipe
python setup.py develop --extra browser
conda env create -f phy-environment.yml
activate phy
python setup.py develop --extra phy
```

1.3 Configuring expipe

Now that you have the environments installed you need to configure expipe. In `c:\apps\expipe-plugin-cinpla/utils` you will find example configuration files. Start by copying all files to `c:/users/uiouusername/.config/expipe`. Open `config.yaml` with Atom, edit according to your user information. Remove processing if you do not know what it is for.

```
data_path: c:/users/uiouusername/expipe_temp_storage
processing:
  data_path: /home/user/expipe_temp_storage
  username: <processing server username>
  hostname: user@ipaddress
norstore:
  data_path: /norstore_osl/projects/NS9048K/server
  username: <norstore username>
  hostname: login.norstore.uio.no
firebase:
  email: your@email.com
  password: yourpassword
  config:
    apiKey: AIzaSyAjGqZwiCKS2333m820e9UdZ7jbnkfEpjw
    authDomain: expipe-26506.firebaseio.com
    databaseURL: https://expipe-26506.firebaseio.com
    storageBucket: expipe-26506.appspot.com
```

Here we have defined two servers, one for *norstore* and one for a *processing* server e.g. your office computer; see [usage](address to usage). Note that you can add arbitrary names for servers.

Following the instructions you should be able to:

```
expipe --help
```


2.1 Nomenclature for CINPLA

Axona

FILENAME: “axona navn” e.g. *22031701*, DATE: *220317*, SESSION: *01*, SUBJECT: subject-id e.g. *1704*, ACTION-ID is thus SUBJECT-DATE-SESSION.

Open Ephys

FOLDERNAME: e.g. *1704_2017-05-13_13-52-26_03*, DATE: *2017-05-13_13-52-26*, which is automatically shortened to *130517*, SESSION: *03*, SUBJECT: subject-id e.g. *1704*, ACTION-ID er thus SUBJECT-DATE-SESSION

NWB file structure and exdir

An action is stored in a folder named after the ACTION-ID. In this folder you will find `main.exdir` containing acquisition, general, analysis, processing. The acquisition contains all the raw data from your measuring instrument, processing contains extracted data which is and shall be processed. Finnaly, in the analysis folder, you will find figures etc. after analysis is perfomed.

2.2 General

Note that you can get all available commands with:

```
$ expipe --help
```

Furthermore if you want help on one particular command:

```
$ expipe transfer --help
```

2.3 Transfer data to and from server

Currently we support two means of transferring data: SCP (SSH), and copy. To maximize transfer speed we recommend using SCP (especially on Windows). The SCP protocol in *expipe-plugin-cinpla* is governed by the command `transfer`. In the `config.yaml` file (see [installation page](#)) you will find:

```
data_path: c:/users/uiusername/expipe_temp_storage
norstore:
  data_path: /norstore_osl/projects/NS9048K/server
  username: <norstore username>
  hostname: login.norstore.uio.no
```

Here `norstore` is the server name, the first `data_path` is the local path and the `data_path` under `norstore` we refer to as the server path. To transfer local data to the server, in its most simple form the `transfer` command can be used as:

```
$ expipe transfer ACTION-ID --from-local
```

This is because `norstore` is the default server name. In order to transfer to a different server we need to add its name with the `--server` command:

```
$ expipe transfer ACTION-ID --from-local --server processing
```

When you want to retrieve your data for manual analysis, you don't want to download all the acquisition data, e.g. only processing and analysis. This can be achieved with the `--exclude` and `--include`:

```
$ expipe transfer ACTION-ID --to-local --include processing --include analysis
```

Note that many commands have a short name, e.g. `--include` can also be used with `-i`:

```
$ expipe transfer ACTION-ID --to-local -i processing -i analysis
```

Conversly if you want to transfer the entire action only excluding the acquisition:

```
$ expipe transfer ACTION-ID --to-local --exclude acquisition
```

2.4 Registering subject

Subjects are registered under the project-id `subjects-registry`. This is to have a complete overview of animals in the lab i.e. *active*, *dead*, *newborn* which information is stored in tags. To register a subject use `register-subject`:

```
$ expipe register-subject SUBJECT --birthday 01.02.2017 --cell_line wild-type
```

2.5 Registering surgery

When performing surgery you can register information with the `register-surgery` command.:

```
$ expipe register-surgery SUBJECT --date 14.05.2017:12:35 --procedure implantation --
↪weight 400
```

2.6 Drive adjustment

The first time you want to adjust the brain-area X, Y (referring to `PAR.TEMPLATES['implantation']['X']`) of a drive an amount of um you need to initialize an adjustment action with the command:

```
$ expipe adjust SUBJECT --init
```

When you have initialized and later make a new adjustment:

```
$ expipe adjust SUBJECT --date dd.mm.yyyyTHH:MM --adjustment X um --adjustment Y um
```

Note that in stead of `--date dd.mm.yyyyTHH:MM` can use `-d now`.

2.7 Working with Axona

Open Anaconda 3 prompt:

```
activate phy
```

To get an overview of available commands:: `expipe -help`

For help på en spesifikk kommando:: `expipe axona register -help`

To overwrite existing data use `--overwrite`:

```
expipe axona register z:\USER\DATA\SUBJECT\FILENAME.set
```

Now modules are loaded to the firebase server and depth registration is prompted to the user.

Spikesorting:

```
$ expipe spikesort ACTION-ID
```

Manual spikesoring with phy:

```
$ phy neo-gui c:\user\uiusername\expipe_temp_storage\ACTION-ID\main.exdir --channel-  
→group 0
```

Save with `ctrl-s`

2.8 Working with Open Ephys

Open Anaconda 3 prompt:

```
activate phy
```

To get an overview of available commands:: `expipe -help`

For help på en spesifikk kommando:: `expipe openephys register -help`

To overwrite existing data use `--overwrite`:

```
expipe openephys register c:\open_ephys\data\1704_2017-05-13_13-52-26_03
```

Now modules are loaded to the firebase server and depth registration is prompted to the user.

Todo: probefile etc.

Data processing:

```
$ expipe openephys process ACTION-ID
```

Todo: Detail the processing: ground channels, cmr vs car, filtering, probe

Manual spikesoring with phy:

```
$ phy neo-gui c:\user\uiusername\expipe_temp_storage\ACTION-ID\main.exdir --channel-  
→group 0
```

Save with *ctrl-s*

2.9 Plotting og analysis

Plotting with notebook:

```
$ expipe generate-notebook ACTION-ID --run
```

kernel -> restart and run all

Make png figurer:

```
$ expipe analyse ACTION-ID --spatial
```

If you only want to look at a particular channel group:

```
$ expipe analyse ACTION-ID --channel-group 0
```

Register cells and transfer data to norstore

When your are finished with the analysis you want to produce a representation of the channel groups on the firebase server. This can be performed with the command:

```
$ expipe register-units ACTION-ID --tag GC --tag BC --message "found a beatiful grid_  
→cell on channel group 2"
```

Example tags: Bare dritt: no, Good shit: yes, Vet ikke: maybe, Head direction: HD, Grid cell: GC, Place cell: PC, Spatial cell: SC, Boarder cell: BC.

Go to *SERVER/PROJECT/ACTION-ID/main.exdir/analysis* to check out the results.

3.1 Getting the source code

We use the Git version control system. The best way to contribute is through [GitHub](#). You will first need a GitHub account, and you should then fork the repository.

3.2 Working on the documentation

The documentation is written in reStructuredText, using the Sphinx documentation system. To build the documentation:

```
$ cd expipe/docs
$ make html
```

Then open *doc/build/html/index.html* in your browser.

3.3 Committing your changes

Once you are happy with your changes, **run the test suite again to check that you have not introduced any new bugs**. Then you can commit them to your local repository:

```
$ git commit -m 'informative commit message'
```

If this is your first commit to the project, please add your name and affiliation/employer to *doc/source/authors.rst*

You can then push your changes to your online repository on GitHub:

```
$ git push
```

Once you think your changes are ready to be included in the main Neo repository, open a pull request on GitHub (see <https://help.github.com/articles/using-pull-requests>).

CHAPTER 4

Authors

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CHAPTER 5

Indices and tables

- `genindex`
- `modindex`
- `search`