# In-Vivo-Imaging-Pipeline

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**Darik A. O'Neil**

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ONE

# MANAGEMENT

## 1.1 Organization module

**class** Organization.**BehavioralExperiment**(*Meta: Tuple[str, str]*, *ExperimentName: str*)

Bases: *Experiment*

Data Class for a generic day of a behavioral task

**Required Inputs**

*Meta* : Passed meta from experimental hierarchy (directory, mouse_id)
*ExperimentName* : Title of ExperimentName

**Properties**

*mouse_id* : Identifies which mouse this data belongs to
*instance_data* : Identifies when this behavioral ExperimentName was created

**Attributes**

*data* : Pandas dataframe of synced data
*folder_dictionary* : A dictionary of relevant folders for this behavioral ExperimentName
*modifications* : List of modifications made to this behavioral ExperimentName
*meta* : bruker metadata
*multi_index*: Pandas multi-index of behavioral components
*state_index* : look-up table / index relating states to integers
*trial_parameters* : behavioral parameters

**Methods**

*add_image_sampling_folder* : Generates a folder for containing imaging data of a specific sampling rate
*load_data* : Loads all data
*record_mod* : Records a modification made to the behavioral ExperimentName (Date & Time)
*update_folder_dictionary* : This function re-indexes all folders in the folder dictionary

**load_data**(*ImagingParameters: Optional[Union[dict, list[dict]]] = None*, **args: Optional[Tuple[str, str]]*, ***kwargs*) → Self

Loads all data

**Parameters**

- **ImagingParameters** (*Optional[dict]*) – Parameters for some imaging dataset or list of datasets (e.g., for two different sampling rates)
- **args** (*Tuple[str, str]*) – Optionally pass Sync Key to synchronize bruker recordings
- **kwargs** – passed to internal functions taking kwargs

**Return type**
Any

class Organization.**Data**(*Path: str*)

Bases: object

This is a class for managing a folder of unorganized data files

**Required Inputs**

*Path* : path to folder

**Self Methods**

*find_matching_files* : Finds all matching files
*reindex* : Function that indexed the files within folder again
*find_all_ext* : Finds all files with specific extension

**Properties**

*instance_data* : Data created
*path* : path to folder
*files* : List of files in folder

**property files: List[str]**

**find_all_ext**(*Ext: str*) → Optional[List[str]]

Finds all files with specific extension

**Parameters**
**Ext** (*str*) – Filename extension

**Returns**
List of files

**Return type**
List[str]

**find_matching_files**(*Filename: str*, *Folder: Optional[str] = None*) → Optional[Tuple[str]]

Finds all matching files

**Parameters**

- **Filename** (*str*) – Filename or ID to search for
- **Folder** (*Any*) – Specify folder filename in

**Returns**
Matching file/s

**Return type**
Any

**property folders: dict**
Dictionary of folders in path

**Return type**
dict

**property instance_date: str**
Date Created

**Return type**
str

**property path: str**
Path to folder

**Return type**
str

**reindex**() → Self
Function that indexes the files within folder again

**class** Organization.**Experiment**(*Meta: Tuple[str, str]*, *ExperimentName: str*)
Bases: object

Class for a generic experiment

**Required Inputs**

*Meta* : Passed meta from mouse (directory, mouse_id)
*ExperimentName* : Title of experiment

**Properties**

*instance_data* : Identifies when this behavioral experiment was created
*mouse_id* : Identifies which mouse this data belongs to

**Attributes**

*data* : a pandas dataframe containing synchronized data
*folder_dictionary* : A dictionary of relevant folders for this experiment
*meta* : bruker metadata
*modifications* : List of modifications made to this experiment

**Public Methods**

*add_image_sampling_folder* : Generates a folder for containing imaging data of a specific sampling rate
*load_data* : Loads all data
*record_mod* : Records a modification made to the experiment (Date & Time)
*update_folder_dictionary* : This function re-indexes all folders in the folder dictionary

**property ExperimentName_id: str**

**add_image_sampling_folder**(*SamplingRate: int*) → Self

Generates a folder for containing imaging data of a specific sampling rate

**Parameters**
**SamplingRate** (*int*) – Sampling Rate of Dataset in Hz

**Return type**
Any

**copy_raw_imaging_data**() → Self

This function copies raw imaging data to the appropriate folder

**Return type**
Any

**property instance_date: str**

Date created

**Return type**
str

**load_data**(*ImagingParameters: Optional[Union[dict, list[dict]]] = None*, **args: Optional[Tuple[str, str]]*, ***kwargs*) → Self

Loads all data

**Parameters**

- **ImagingParameters** (*Optional[dict]*) – Parameters for some imaging dataset or list of datasets (e.g., for two different sampling rates)
- **args** (*Tuple[str, str]*) – Optionally pass Sync Key to synchronize bruker recordings
- **kwargs** – passed to internal functions taking kwargs

**Return type**
Any

**Return type**
Any

**property mouse_id: str**

ID of mouse

**Return type**
str

**record_mod**() → Self

Records a modification made to the behavioral ExperimentName (Date & Time)

**Return type**
Any

**update_folder_dictionary**() → Self

This function re-indexes all folders in the folder dictionary

**Return type**
Any

**class** Organization.**Figures**(*Path: str*)

Bases: *Data*

A class for storing figures, inherits collected data folder

**view_figure**(*Name: str*) → plt.Figure

Function identifies and views a figure based on supplied name

**Parameters**
**Name** (*str*) – Name of figure (can be partial)

**Returns**
the plotted figure

**Return type**
Any

**class** Organization.**Images**(*Path: str*)

Bases: *Data*

Class specifically for folders containing raw images, inherits collected data folder

**property channels**

**property file_format**

**property frames**

**property height**

**property imaging_files**

**property meta_files**

**property num_imaging_files**

**property num_meta_files**

**property planes**

**reorganize_bruker_files**() → None

This function extracts out the meta files and saves in a new directory

**Return type**
None

**property width**

**class** Organization.**ImagingAnalysis**(*Path: str*)

Bases: *Data*

Class specifically for imaging analysis folders, inherits collected data folder

**Self Methods**

*load_fissa_exports* : loads fissa exported files
*load_cascade_exports* : loads cascade exported files
*load_suite2p* : loads suite2p exported files
*export_registration_to_denoised* : moves registration to new folder for namespace compatibility when skipping denoising step
*clean_up_motion_correction* : This function removes the reg_tif folder and registered.bin generated during motion correction.
*clean_up_compilation* : This function removes the compiled tif files
*add_notes* : Function adds notes

**add_notes**(*Step: str*, *KeyOrDict: Union[str, dict]*, *Notes: Optional[Any] = None*) → Self

Function adds notes indicating steps

**Parameters**

- **Step** – Step of Analysis
- **Step** – str
- **KeyOrDict** (*Union[str, dict]*) – Either a Key or a dictionary containing multiple key-value (note) pairs
- **Notes** (*Optional[Any]*) – If using key, then notes is the paired value

**Return type**
Any

**clean_up_compilation**() → Self

This function removes the compiled tif files generated inside CompiledImagingData (You can avoid the creation of these in the first place by changing suite2p parameters)

**Return type**
Any

**clean_up_motion_correction**() → Self

**This function removes the reg_tif folder and registered.bin generated during motion correction.**
(You can avoid the creation of these in the first place by changing suite2p parameters)

**Return type**
Any

**property current_ExperimentName: str**

ExperimentName of Analysis

**Return type**
str

**default_folders**()

**export_registration_to_denoised**()

moves registration to new folder for namespace compatibility

**Returns**

**load_cascade_exports**() → Tuple[ndarray, ndarray, ndarray, dict]

This function loads the Spike Times, Spike Prob, Discrete Approximation and ProcessedInferences files exported from Cascade

**Returns**
SpikeTimes, SpikeProb, DiscreteApproximation, Processed Inferences

**Return type**
tuple[Any, Any, Any, dict]

**load_fissa_exports**() → Tuple[dict, dict, dict]

This function loads the prepared and separated files exported from Fissa

**Returns**
Prepared, Separated, ProcessedTraces

**Return type**
tuple[dict, dict, dict]

`load_suite2p`(**args: str*)

`class` Organization.`Mouse`(***kwargs*)

Bases: `object`

Class for Organizing & Managing Experimental Data Across Sessions

**Keyword Arguments**

*Logfile* : Path to existing log file (str, default None)
*Mouse* : Mouse ID (str, default None)
*Condition* : Experimental Condition (str, default None)
*Directory* : Directory for hierarchy (str, default None)
*Study* : Study (str, default None)
*StudyMouse* : Study ID (str, default None)

**Properties**

*mouse_id* : ID of Mouse
*log_file* : Log Filename Path
*experimental_condition* : Experiment condition of the mouse
*instance_data* : Date when this experimental hierarchy was created

**Attributes**

*directory* : Experimental Hierarchy Directory
*experiments* : Names of included experiments
*study* : Study
*study_mouse* : ID of mouse in study
*modifications* : modifications made to this file

**Public Class Methods**

*load* : Function that loads the entire mouse

**Public Methods**

*create* : This function creates the directory/logs/organization.json if it doesn't exist
*check_log* : Checks Log Status
*create_log_file* : Creates log file
*pass_meta* : Passes directory/mouse id
*record_mod* : Record modification of experiment
*record_experiments_mod* : Record modification of experiments
*save* : Saves mouse to organization.json
*start_log* : Starts Log

**Private Class Methods**

*_generate_analysis_subdirectory* : Generate Analysis

*_generate_analysis_technique_subdirectory* : Generate Analysis Technique

*_generate_behavior_subdirectory* : Generate Behavioral Folder

*_generate_directory_structure* : Generates the Directory Structure (The structured folders where data stored)

*_generate_experiment_folders* : Generate Behavioral ExperimentName Folder

*_generate_histology_directory* : Generates Histology Folder

*_generate_imaging_subdirectory* : Generate Imaging Folder

*_generate_roi_matching_index_directory* : Generate ROI Matching Folder

**check_log**() → Self

Checks log status

**Return type**
Any

**create**() → Self

This function generates the directory hierarchy in one step

**Return type**
Any

**create_experiment**(*ExperimentName: str*, *Type: Optional[str, object] = 'Experiment'*, ***kwargs*) → Self

Generates an experiment ExperimentName folder and attribute

Kwargs are passed to underlying functions

**Parameters**

- **ExperimentName** (*str*) – Name of experimental ExperimentName
- **Type** (*Optional[str, object]*) – Type of experimental ExperimentName (Optional, default = Experiment)

**Return type**
Any

**create_log_file**() → Self

Creates log file

**Return type**
Any

**end_log**() → Self

Ends Logging

**Return type**
Any

**property experimental_condition: str**

Experiment condition of the mouse

**Return type**
str

**property instance_date: str**

Date when this experimental hierarchy was created

**Return type**
str

**classmethod load**(*Directory: str*) → *Mouse*

Function that loads the entire mouse

**Parameters**
**Directory** (*str*) – Directory containing the organization.json file and associated data

**Returns**
Mouse

**Return type**
ExperimentManagement.Organization.Mouse

**property log_file: str**

Log Filename Path

**Return type**
str

**property mouse_id: str**

ID of Mouse

**Return type**
str

**pass_meta**() → Tuple[str, str]

Passes directory/mouse id

**Returns**
directory/mouse id

**Return type**
tuple[str, str]

**record_experiment_mod**(*ExperimentNameKey: str*, **args*) → Self

Record modification of experiment (Data, Time, *args)

**Parameters**

- **ExperimentNameKey** (*str*) – The key name for the ExperimentName
- **args** (*str*) – A string explaining the modification

**Return type**
Any

**record_mod**(**args: str*) → Self

Record modification of experiment (Data, Time, *args)

**Parameters**
**args** (*str*) – A string explaining the modification

**Return type**
Any

**save**() → Self

Saves Mouse to json

**Return type**
Any

**start_log**() → Self

Starts Log

**Return type**
Any

**update_all_folder_dictionaries**() → Self

This function iterates through all behavioral ExperimentNames to update their folder dictionaries

**Return type**
Any

**class** Organization.**Study**

Bases: object

Organization.**generate_read_me**(*AbsoluteFilePath: str*, *Text: str*) → None

Generate a read me file

**Parameters**

- **AbsoluteFilePath** (*str*) – Filename path
- **Text** (*str*) – Text inside

**Return type**
None

Organization.**get_date**()

Organization.**get_time**()

## 1.2 UserInterfaces module

UserInterfaces.**select_directory**(***kwargs*) → str

UserInterfaces.**verbose_copying**(*src*, *dst*) → None

CHAPTER

TWO

# INDICES AND TABLES

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- modindex
- search

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