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Data Analysis Suite Package – Documentation

Contents

Installation

- Go to: https://github.com/BenceSzmola/DataAnalysisSuite
- Download the package from the master branch (usually it's the most stable but might not yet have all the latest features)
   - Click "Code", then "Download ZIP", save it wherever you wish
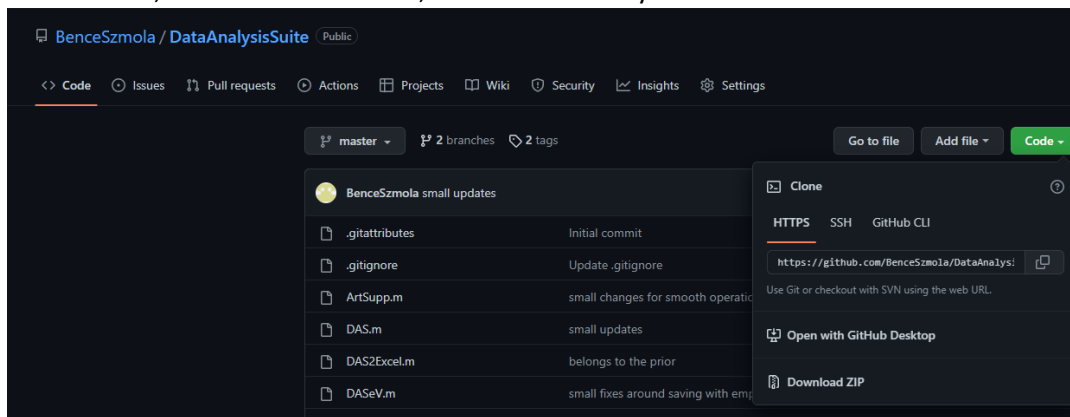
- Open MATLAB, under Home tab select "Set Path" and using Add Folder, add the folder where you extracted the downloaded ZIP. Don't forget to save!
- Now you can start the GUIs by writing DAS, DASeV and DASevDB respectively in the command line

GUI #1: DAS

- Functions
  - Import raw data
    - Currently supported formats:
      - Intan's RHD (electrophysiology a.k.a. ephys)
      - MATLAB variables exported from MES Curve Analysis window (electrophysiology & imaging)
      - CSV (treadmill data)
  - Visualizing data
  - Processing tools for raw data
  - Event detection (ephys, imaging, simultaneous)
  - Saving detections
- Importing data

  -
    - 1: Checkboxes to select which datatype(s) you want to work with
      - By selecting one, the corresponding import options become available
    - 2: Data import options
      - Import RHD: import .rhd files using the Intan import script
      - Import gorobj: import variables which were exported from MES curve analysis window
        - Might extend this to also import from .gor files
      - Import run csv: imports data from the treadmill .csv files
      - Import settings
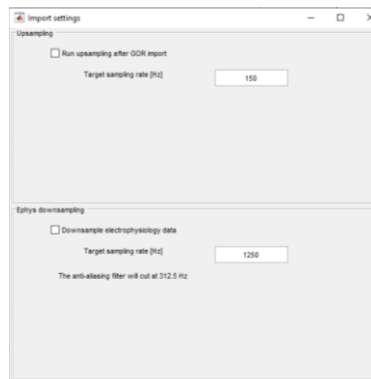
- o
  - o Enable upsampling (meant for imaging data) and/or downsampling (meant for ephys data) of imported data
    - 3: Listboxes containing the imported data
    - 4: Data display section
- Data processing
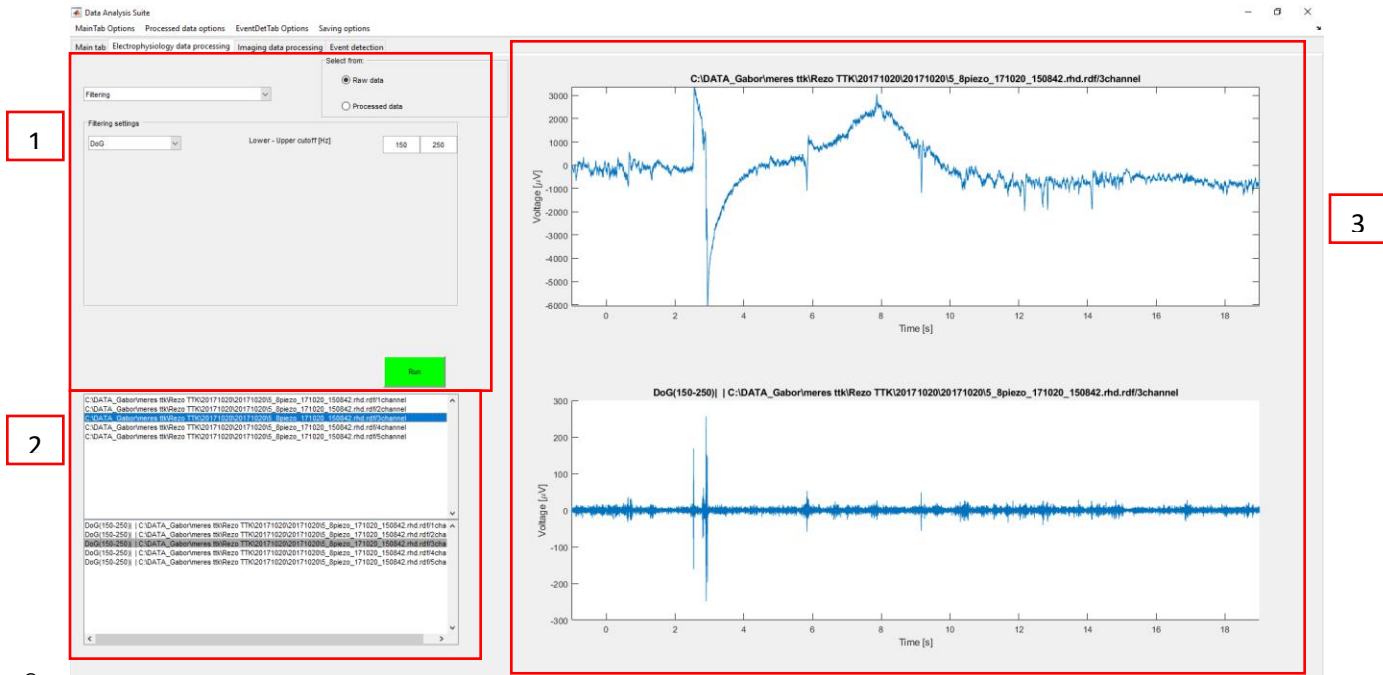
- o
- o 1: Processing setup: here you can choose what type of processing you want to do and set the required parameters
  - Using the toggle buttons you can set whether the processing will work on the raw data or data that was already processed in some way
- o 2: Listboxes containing the raw and processed data
  - The upper box contains the raw data
  - The lower contains the processed data
    - Right click in the lower listbox to delete processed data from memory
- o 3: Data visualization
  - Upper graph shows the selected raw data
  - Lower graph shows the selected processed data

- Event detection

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- o 1: Setup of event detection:
    - Select channel(s) for detection (only ephys)
        - There is the option to select channel(s) from the processed data in memory or to run processing before detection
        - If there are intervals in the recording which shouldn't be taken into consideration when running the detection check the "Select interval" box
    - Select detection method, and specify settings for that method
- o 2: Parameters of detected events
    - Here you can see the automatically extracted parameters for the displayed event
- o 3: Display of events and buttons for browsing through them and deleting them if needed
- Saving detection

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- o There are some options depending on what was loaded and what was used for detection
    - Which detection to save (ephys, imaging, simultaneous)

- If simultaneous is selected both the ephys and imaging individual detections are also saved
    - Should the running data be saved
    - Should all loaded channels be saved or only those which were used in the detection
    - Choosing the name of the save file
        - There is always a tag attached to the name for easy identification later
        - If RHD was loaded, the RHD filename is used as default, otherwise the current date is the default

GUI #2: DASeV

- Functions
    - Examining detections saved by DAS in more detail
    - Saving individual events to database
- Loading from the DAS save files
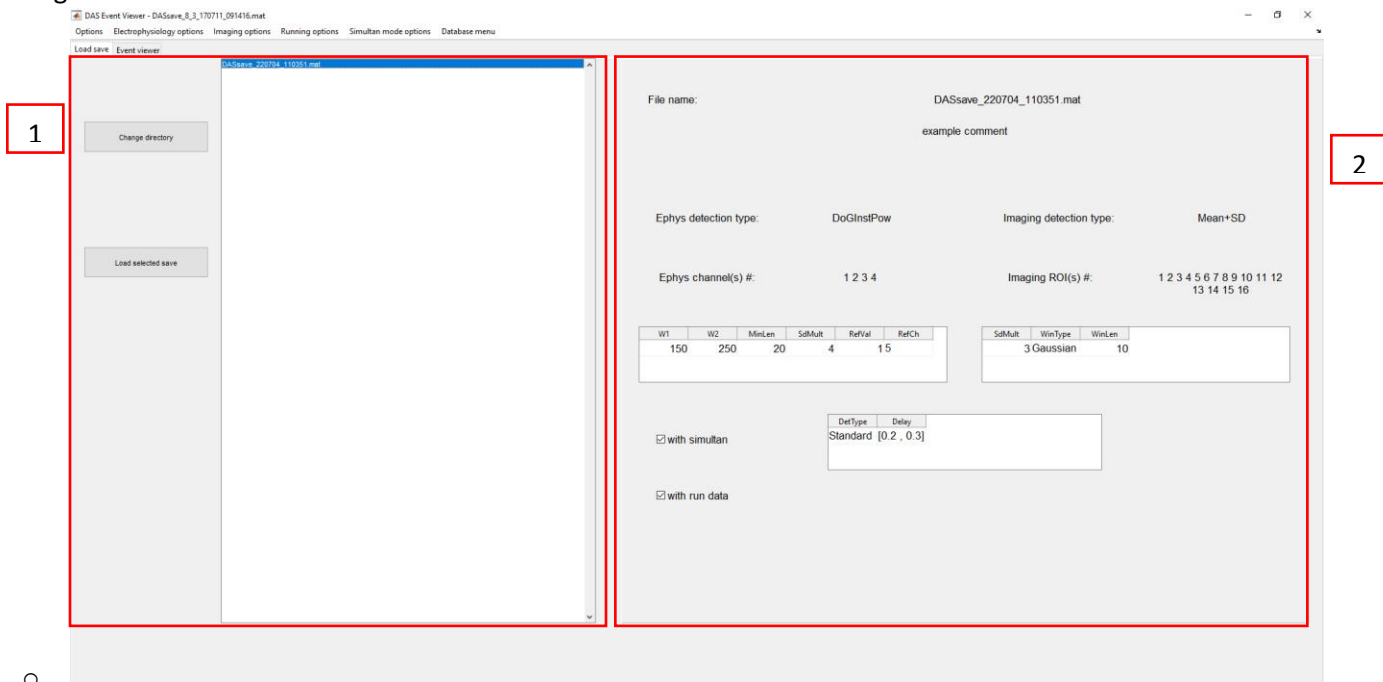
    -
    - 1: File selection part
        - Select the directory with "Change directory" → select the save file you want to load from the list → load it using the "Load selected save" button
    - 2: Information panel
   - Here you get a preview of what is in the highlighted save file

- Examining & saving events

- o
- o 1: Event parameters
- o 2: Panel for selecting events to be saved to database
- o 3: Graphs showing the events + buttons to step through them
  - ▪ Ephys data can be displayed in up to three different forms at once (wideband/raw, bandpassed, power)
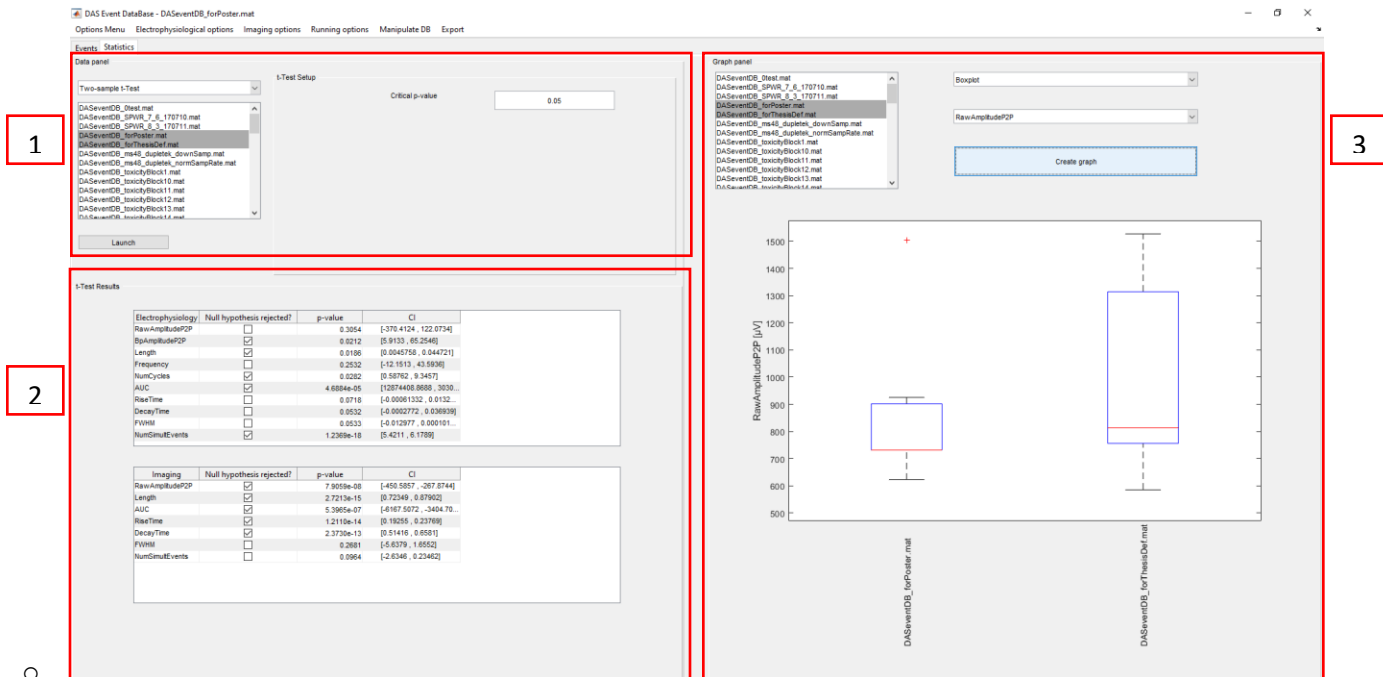
GUI #3: DASevDB

- Functions
  - o Examining the event database
  - o Computing statistics from the database
- Examining database
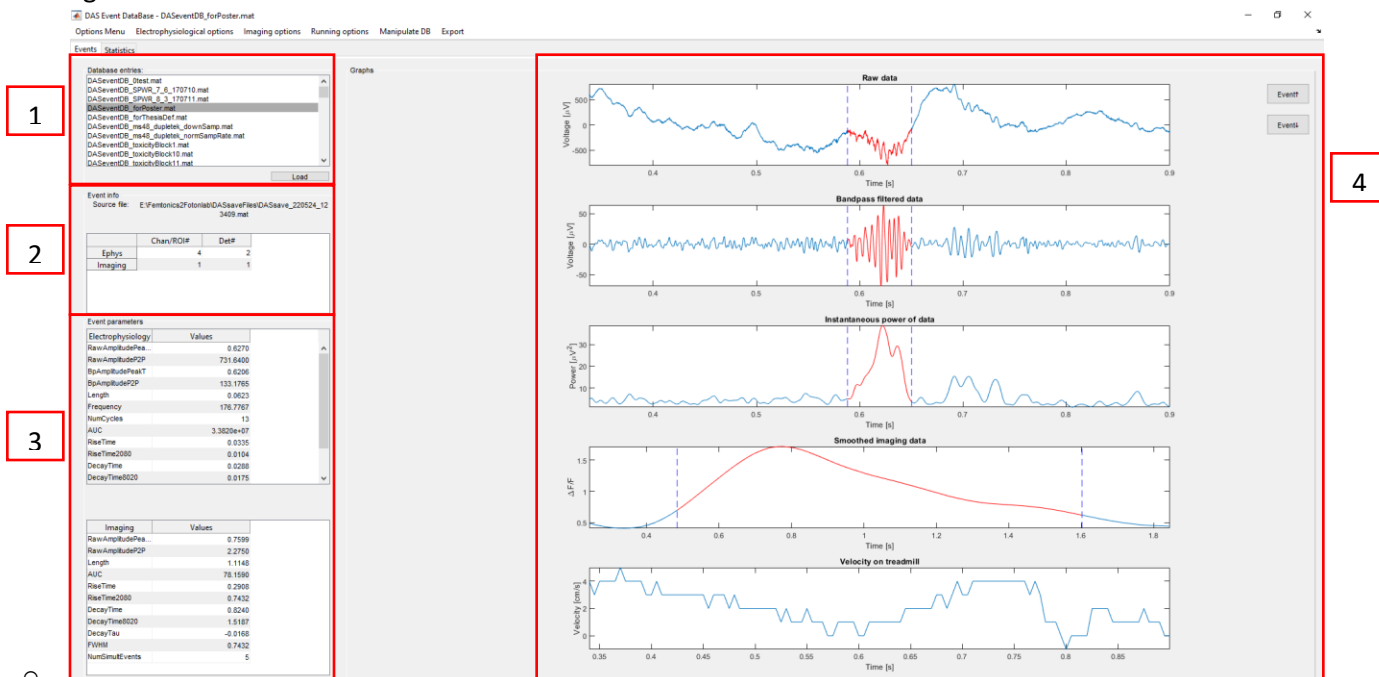
- o
- o 1: Select which group of events to load
- o 2: Information on the source of the event

- - ▪ Which DAS save file it is from
    - ▪ Channel and event number in the original detection from where it was taken
  - o 3: Event parameters
  - o 4: Display of events
- Statistics

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  - o 1: Setup for statistics computations (basic stats, t-tests)
  - o 2: Results of the statistics computation
    - ▪ If the selected event group contains both ephys and imaging data then the upper table shows the stats for ephys and lower the results for imaging
  - o 3: Statistically relevant plot generation
    - ▪ Select which group(s) you want to use
    - ▪ Select the type of plot
    - ▪ Select parameter to plot
    - ▪ Click "Create graph"