GBI 2022 OMERO Workshop

The presentation and a PDF version of the workshop are available at https://downloads.openmicroscopy.org/presentations/2022/GBI

Software versions used for this workshop:

- OMERO: 5.6.3
- OMERO.web: 5.12.0
- omero-guides: 2021.11.09
- OMERO.insight: 5.6.2
- OMERO.insight-ij: 5.6.2
- OMERO.iviewer: 0.11.1
- OMERO.figure: 4.4.2
- OMERO.parade: 0.2.1
- OMERO.duplicate: 0.4.0
- OMERO R gateway: 0.4.8
- Bio-Formats: 6.5.1
- Fiji/ImageJ: 2.0.0-rc-69/1.52p
- Matlab R2019a
- QuPath 0.3.0
- omero-metadata: 0.5.0
- Ilastik 1.3.3 (pipeline), 1.4.0b5 (inside the docker)

Summary

OMERO core concepts
- Import of images into OMERO
- Data management - Metadata
- Search
- Viewer -3D Viewer
OMERO figure
- How to use figure

Analysis with 3rd party tools
- Analysis with Fiji: manual
- Analysis with Fiji: scripting
- Analysis in OMERO using Ilastik (optional)
- Analysis in OMERO using Cell Profiler (optional)
Server side analysis
- How to write script
- How to manage script
Data mining using OMERO.parade

Programme

Import

In this section we will cover the various import options such as the import with or without data transfer and synchronous vs. asynchronous.

Desktop client install and import

For these 2 workflows, see
Video https://www.youtube.com/watch?v=U5rH7ZmylAI&t=149s

Command line import, bulk import, in-place import

These import sections not covered in the workshop can be found at https://omero-guides.readthedocs.io/en/latest/upload/docs/import.html

OMERO core concepts

Data management and cooperation

See:
Short video https://www.youtube.com/watch?v=v85YD4cORk4

Viewing images (OMERO.iviewer)


Annotate data and filter using annotations

See:
Short video https://www.youtube.com/watch?v=kW9O1M1obKc
Search

Viewing images (3D viewer: OMERO.FPBioimage)

Export

OMERO parade

Data mining using OMERO.parade on Projects and Plates

OMERO figure

Fast creation of publication figures using OMERO.figure
See https://omero-guides.readthedocs.io/en/latest/figure/docs/omero_figure.html

Analysis
This part constitutes the core of the training and we will explore the different means OME provides to interact with image and non-image data and how to best integrate these into your workflows.

Analysis with Fiji

- Analysis with Fiji: Java
  - Fiji client side: manual Analysis via UI
  - Fiji client side: scripting: Groovy and Macro
  - Fiji: Analysis in the cloud: Java and Macro

For setup of the Fiji plugin see

For the walkthrough in this workshop, see the four Fiji chapters
https://omero-guides.readthedocs.io/en/latest/fiji/docs/threshold_scripting.html and
Analysis with Ilastik

- Analysis with ilastik: Python
  - Manual Analysis via UI
  - Analysis in the cloud: Python
See for both setup and workflows

Server side analysis

- Analysis server side
  - How to write a Python script
  - How to upload the script to the server

Server-side scripts (python)
For further information about how to write and manage server-side scripts see

OMERO parade

Data mining using OMERO.parade on Projects and Plates

Analysis with CellProfiler (for your information only)

- Analysis with CellProfiler: Python
  - Analysis in the cloud: Python and using CellProfiler API
See for all CellProfiler workflows
Note that https://mybinder.org/ will be used for CellProfiler setup as described in
https://github.com/ome/omero-guide-cellprofiler

Analysis in QuPath (for your information only)
See for QuPath analysis

Analysis in R (for your information only)
See for R analysis
Optional analysis (for you information only)
See for Python scripts (for your information only)
See for Java scripts (for your information only)