



Collaboratory Lab

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Simulate with EBRAINS

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What is the Lab

- The Collaboratory offers an environment (the "Lab") for EBRAINS users to run Jupyter Notebooks with all the features of Jupyter Lab.
- In the Lab, HBP/EBRAINS tools are pre-installed for users, via official EBRAINS releases which have been tested to work together, or via experimental deployment.
- The Notebooks run in a Docker container. Your runs are mostly isolated - or sandboxed - from those of other users.
 - Data stored in the container is not permanent. Instead, use the Drive or Bucket for permanent and shared data.
 - Container storage is a shared resource across containers on the same site. Do not use the Lab to produce very large data files.
- Lab users can select from multiple Python kernels and R kernels, typically one per deployment. Older official EBRAINS releases remain available to run your older notebooks.

Benefits of the Lab

- **Reproducibility**
 - Same environment + same input = same output
- **Usability**
 - Easy to use, already contains EBRAINS tools out of the box
- **Long-term sustainability**
 - A notebook that runs today will work for years to come
- **Comparability**
- Papers published can reference an official EBRAINS YY.MM release
- **Easy integration of EBRAINS tools**
 - Tool developers have an easy path to integrate their tools into official EBRAINS images

For the Lab user

- The end user can select on which Fenix site to run the Notebook. This selection is done when the user enters the Lab.
- For a given notebook, the user selects a specific kernel at run time from the Lab. The information about the selected kernel is stored in the notebook for future use.
- Reliable reproduction even years after running an experiment ensures long term reproducibility.
 - Experiment run on EBRAINS YY.MM release

For the tool developer

- EBRAINS tool developers can contact the technical coordination team to have their tools added to the official EBRAINS release.
- Quality assurance: tool developers provide automated builds and test for each tool. The TC team runs the build, test, and deploy.
- Multiple versions of a tool can be installed side by side.
- EBRAINS will release new official releases at regular intervals to ensure tools are kept up to date.

The Lab run-time environment

- The EBRAINS deployment of official releases of EBRAINS tools is meant to ensure users in the Lab share a common version of tools. Users identifying missing tools that require compilation should contact Support.
- Every release includes
 - pip to install additional Python packages
 - cross-compilers e.g. for Neuromorphic computing
- Each release will not include
 - Conda or other similar package management tools

More details

- The Lab's Docker image is based on the smallest possible distribution which supports Jupyter Hub and Jupyter Lab. Having a lighter image is important to help optimize start up times of new containers.
- The image mounts 2 partitions:
 - the Collaboratory Drive
 - a partition that contains the installation of the official EBRAINS tool releases
- Notebooks have access to environment variables with the following details:
 - Which collab the notebook is stored in
 - Which collab it was launched from
 - Which site it is run on
 - The name of the notebook itself

Using nbgitpuller

- Share Lab links to work with content from external git repository
 - This can be used to share Jupyter notebooks, data, etc (max total 100 MB)
 - This is limited to publicly available git repos
 - HBP members are required by HBP to use validated git repos only (mostly github), not one in your institution.
 - Procedure:
 - create your git repo and populate it (or use an existing one)
 - generate a nbgitpuller link
 - share that link to people as you see fit, e.g. by email, in a wiki page, in the navigation of a collab's Wiki
 - users clicking on the link will go directly into the Collaboratory Lab with the git repo sync'ed to the user's Lab container (not the Drive), and optionally a specific notebook is opened directly
 - Advantages:
 - allows users to keep using their git workflows while seamlessly integrating with the Lab

Using nbgitpuller (cont.)

- step 2: generate an nbgitpuller link by visiting <http://nbgitpuller.link>

https://lab.ch.ebrains.eu/hub/user-redirect/git-pull?repo=https%3A%2F%2Fgithub.com%2Fdonnemartin%2Fdata-science-ipython-notebook:

JupyterHub URL: ✓
The JupyterHub to send users to. [nbgitpuller](#) must be installed in this hub.

Git Repository URL: ✓
branch: ✓
Use `main` instead of `master` for new GitHub repositories

File to open: ✓
This file or directory from within the repo will open when user clicks the link.

Application to Open:
 Classic Jupyter Notebook
 RetroLab
 JupyterLab
 RStudio
 Shiny
 Custom URL

Relative URL to redirect user to:

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git repo

notebook to open

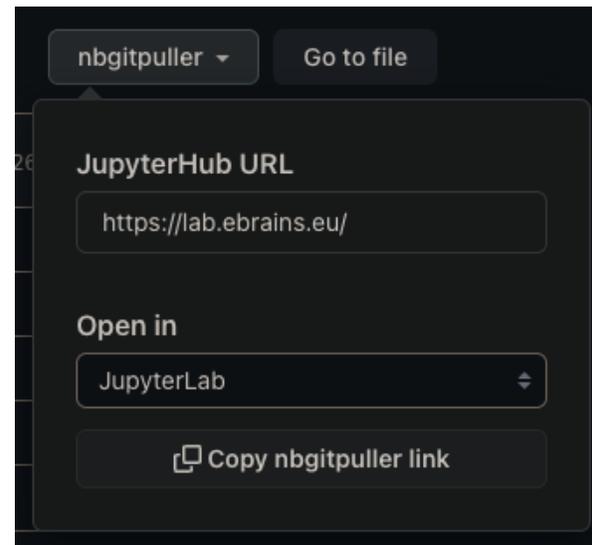
choose JupyterLab

Using nbgitpuller (cont.)

Clicking on nbgitpuller link automatically pulls git repository and opens the repo in the Lab

Even simpler with the nbgitpuller extension for [Firefox](#) and [Chrome](#). This adds a new button in github

Hit this button
Set it to use the Collaboratory Lab
Click "Copy nbgitpuller link"



Try the Lab today

- For Lab users:
 - Go to a collab with sample notebooks: "The Collaboratory" or "Demo collab"
 - Open the Lab (requires being logged in)
 - Run a notebook
 - Modify a notebook
 - Experiment with the official tools
 - Use pip install to install your most used Python packages
- For the tool developers
 - Look at getting your tools included in the official EBRAINS release

Thank you

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