

Master in Scientific Computing and Data Analysis (MISCADA)

Computer Infrastructure

A. Reinarz, C. Marcotte , D. Maître¹
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¹daniel.maitre@durham.ac.uk

Programming skills and proficiencies

- MISCADA requires some baseline proficiency in C programming — see the pre-sessional C & C++ Programming Course on Blackboard Ultra
- Some modules also utilize Python (esp. those with ML and Data Science content)
- Some modules may incorporate other languages as the lecturer sees fit

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We can not give you advice on purchasing decisions.

Clusters at Durham University

- Hamilton
- BEDE
- NVIDIA Cuda Centre (NCC)
- Complete list of platforms. . .

Jupyter Notebooks

Jupyter notebooks are interactive documents where text, code and images are combined

These support a number of languages; highlighting those relevant for MISCADA:

- C and C++ (c.f., pre-sessional Software Development in C course)
- Python
- R

Notebook Access

Using a modern web browser², you should access the notebook server with:

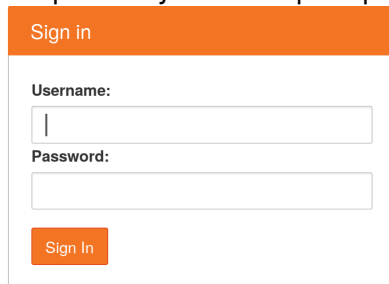
`https://COURSE.notebooks.danielmaitre.phyip3.dur.ac.uk/`

Where COURSE can be

- miscada-python-2425,
- miscada-da-2425,
- miscada-sc-2425,
- miscada-ml-2425,
- ...

The notebook server is accessible from anywhere.

These present you with a prompt:



Sign in

Username:

Password:

Sign In

Sign in with your *CIS credentials*.

²Something which is receiving updates. . .

Notebook Platform

When you access the notebook platform, a new virtual machine is created in the background.

This virtual machine will become *your own notebook server*.

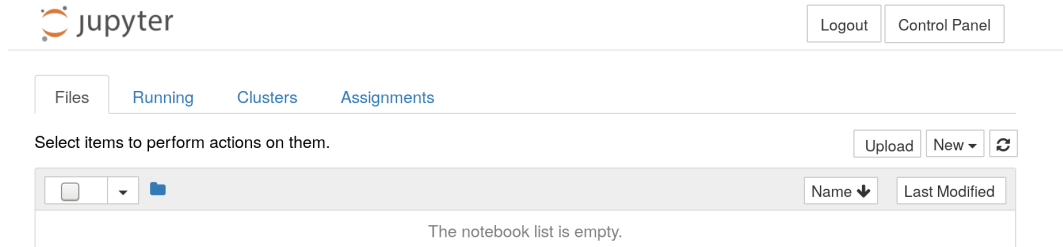
A note about server load

During periods of high utilization, it can take a while (10-60 seconds) to create the virtual machine. Please be patient.

- After one hour of inactivity the server is shut down.
- The files persist, and will be there when you log back in.
- However, you will need to *re-execute your code* to restore the notebook state.

Notebook Usage

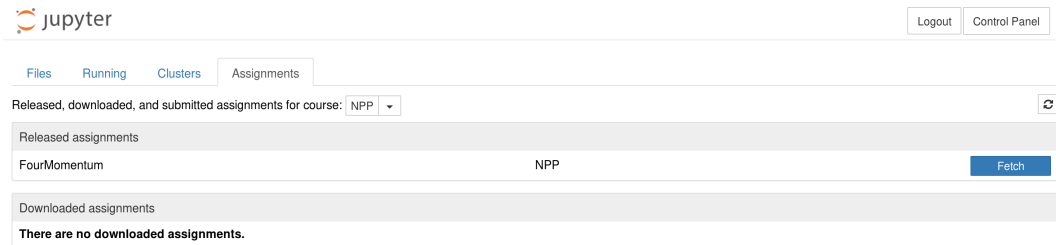
Once logged in you will see the files interface:



The *New* button is where you can create notebooks or terminals.

Fetching Assignments

To access the assignments for the course, use the *Assignments* tab:

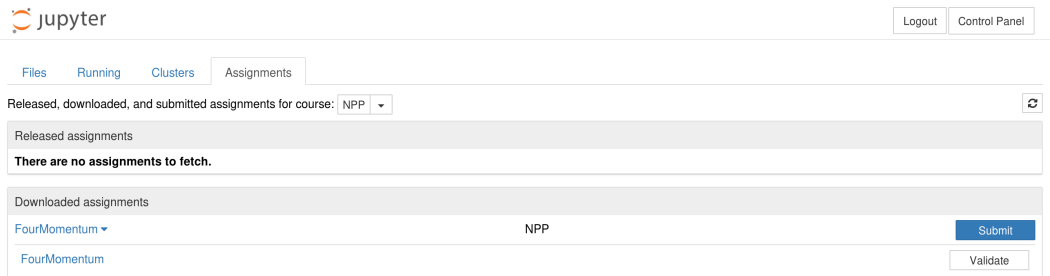


The screenshot shows the JupyterLab web interface. At the top left is the Jupyter logo. At the top right are 'Logout' and 'Control Panel' buttons. Below the header is a navigation bar with tabs: 'Files', 'Running', 'Clusters', and 'Assignments'. The 'Assignments' tab is selected. Below the tabs, it says 'Released, downloaded, and submitted assignments for course: NPP' with a dropdown arrow. To the right of this is a refresh icon. Below this is a section titled 'Released assignments'. It contains a table with one row: 'FourMomentum' in the first column, 'NPP' in the second column, and a blue 'Fetch' button in the third column. Below this is a section titled 'Downloaded assignments'. It contains a message: 'There are no downloaded assignments.'

The *Fetch* button will copy the assignment notebooks to your own server.

Downloaded Assignments

Once *Fetch*ed, assignments are displayed in the *Downloaded assignments* block:



The screenshot shows the Jupyter web interface. At the top left is the Jupyter logo. At the top right are 'Logout' and 'Control Panel' buttons. Below these are tabs for 'Files', 'Running', 'Clusters', and 'Assignments'. The 'Assignments' tab is active. Below the tabs, it says 'Released, downloaded, and submitted assignments for course: NPP' with a dropdown arrow and a refresh icon. There are two main sections: 'Released assignments' and 'Downloaded assignments'. The 'Released assignments' section contains the text 'There are no assignments to fetch.' The 'Downloaded assignments' section contains a table with one row. The row has a dropdown menu showing 'FourMomentum', the text 'NPP', a blue 'Submit' button, and a 'Validate' button.

Downloaded assignments			
FourMomentum ▾	NPP	<button>Submit</button>	<button>Validate</button>

Once downloaded, each assignment can be opened to show all notebooks contained within.

Assignment Submission

- Click on one of the notebooks and it will open for you to work on
- If requested, submit your finished notebook.
- You can submit as often as you desire:
 - Last submission before the deadline counts
 - Useful to submit partial work to avoid missing a deadline — submit early, submit often!
 - Do not change the name of the notebook!
 - Late submissions up to 5 days after the deadline can be accepted, but the marks are capped at 50% — If you want this to happen, you *must contact the office*.
- Check the submitted notebook works as intended by restarting the kernel and running all cells.

Acceptable Use Policy

The university's IT policy³ applies on the server.

The notebook server is to be used for *coursework at Durham University*, please do not use it for any other purposes.

³<https://www.dur.ac.uk/cis/policy/regulations/>

Privacy and Backups

All files saved on the server can be viewed by the server administrator:
please do not do put anything confidential on the server.

You can make a copy of notebooks for your safe-keeping at any time.

We encourage you to use the *Download as* option in the *File* menu of the notebook to preserve your work locally:

- Select a PDF (.pdf) for archival,
- or a notebook (.nb) to preserve executability and markdown text.

Questions

For administrative questions regarding the computer infrastructure for the MISCADA programme, please contact:

Prof. Daniel Maître at daniel.maitre@durham.ac.uk.