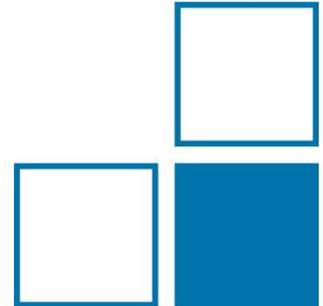


Decentralized software engineering and CI/CD in a European joint research project

Björn Ludwig, WG PSt1 „Coordination Digitalization“



CI/CD for high quality open-source code



Who are we?

Why do we code collaboratively?

Where do we code?

What has been done?

What are we up to?

Who are we?

Physikalisch-Technische Bundesanstalt



Who are we?



Physikalisch-Technische Bundesanstalt

- National Metrology Institute of Germany
 - scientific and technical service tasks
 - measuring with the highest accuracy and reliability



Metrology for the Factory of the Future

Met4FoF is a European joint research project with

- 15 European research institutes including several NMIs
- Over 30 industry partners
- The three development goals:
 - "Metrological frameworks for the traceable calibration of smart sensors..."
 - "Guidelines ... for the ... metrological treatment of networks of smart sensors..."
 - "Mathematical frameworks for the ... real-time evaluation of uncertainties..."

Why do we code collaboratively?



Committed to produce open-source code

Several commitments in the central project contract

... initiate an open-source software repository for ... collaborative development of software tools ...

... web-based software repository ... will be employed ...

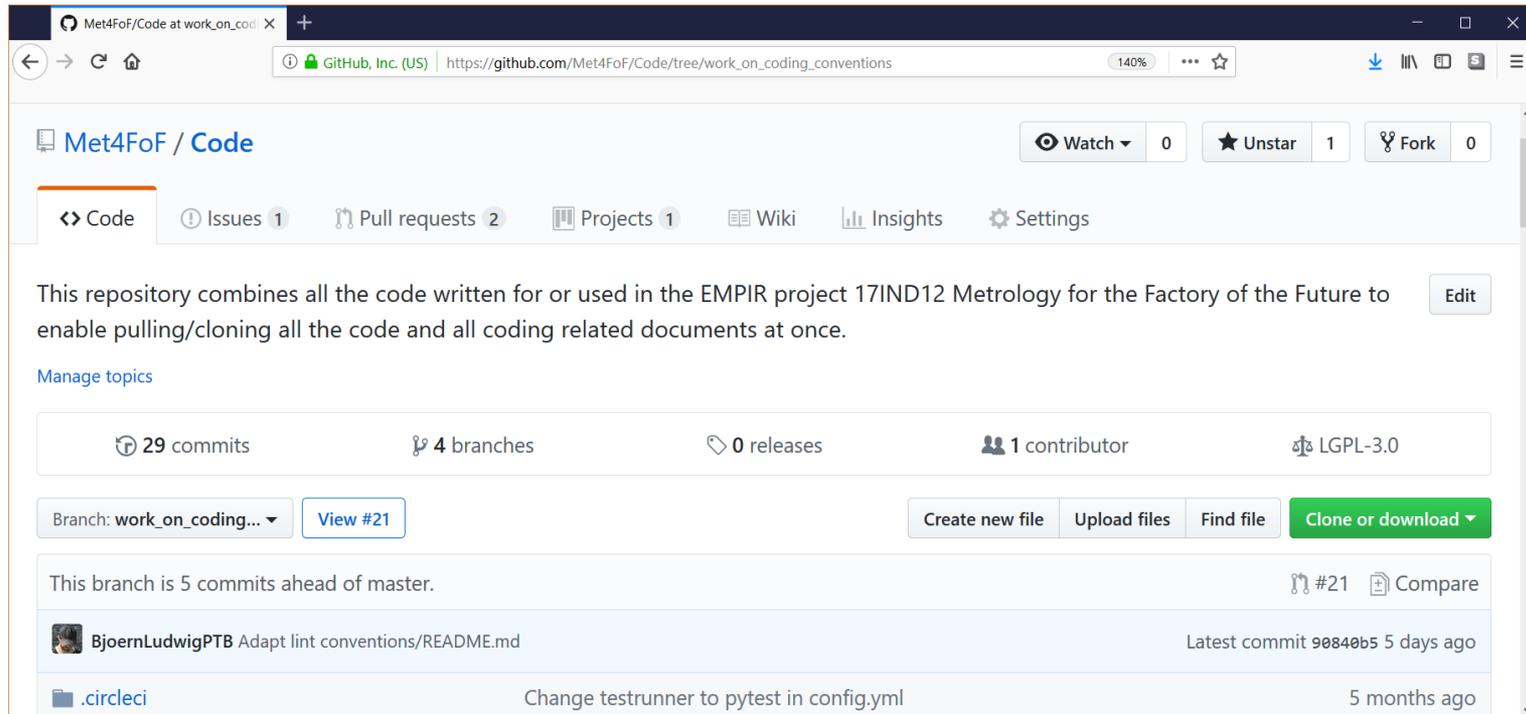
... following the FAIR principles ...

Where do we collect the code?

Met4FoF repository on GitHub



https://omicron.com/



The screenshot shows the GitHub repository page for `Met4FoF/Code` at the `work_on_coding_conventions` branch. The repository is owned by `Met4FoF` and has 0 watches, 1 unstar, and 0 forks. The description states: "This repository combines all the code written for or used in the EMPIR project 17IND12 Metrology for the Factory of the Future to enable pulling/cloning all the code and all coding related documents at once." The repository statistics show 29 commits, 4 branches, 0 releases, 1 contributor, and the license is LGPL-3.0. The current branch is `work_on_coding...`, which is 5 commits ahead of master. The latest commit is by `BjoernLudwigPTB` with the message "Adapt lint conventions/README.md" and was made 5 days ago. A recent commit history entry shows `.circleci` with the message "Change testrunner to pytest in config.yml" from 5 months ago.

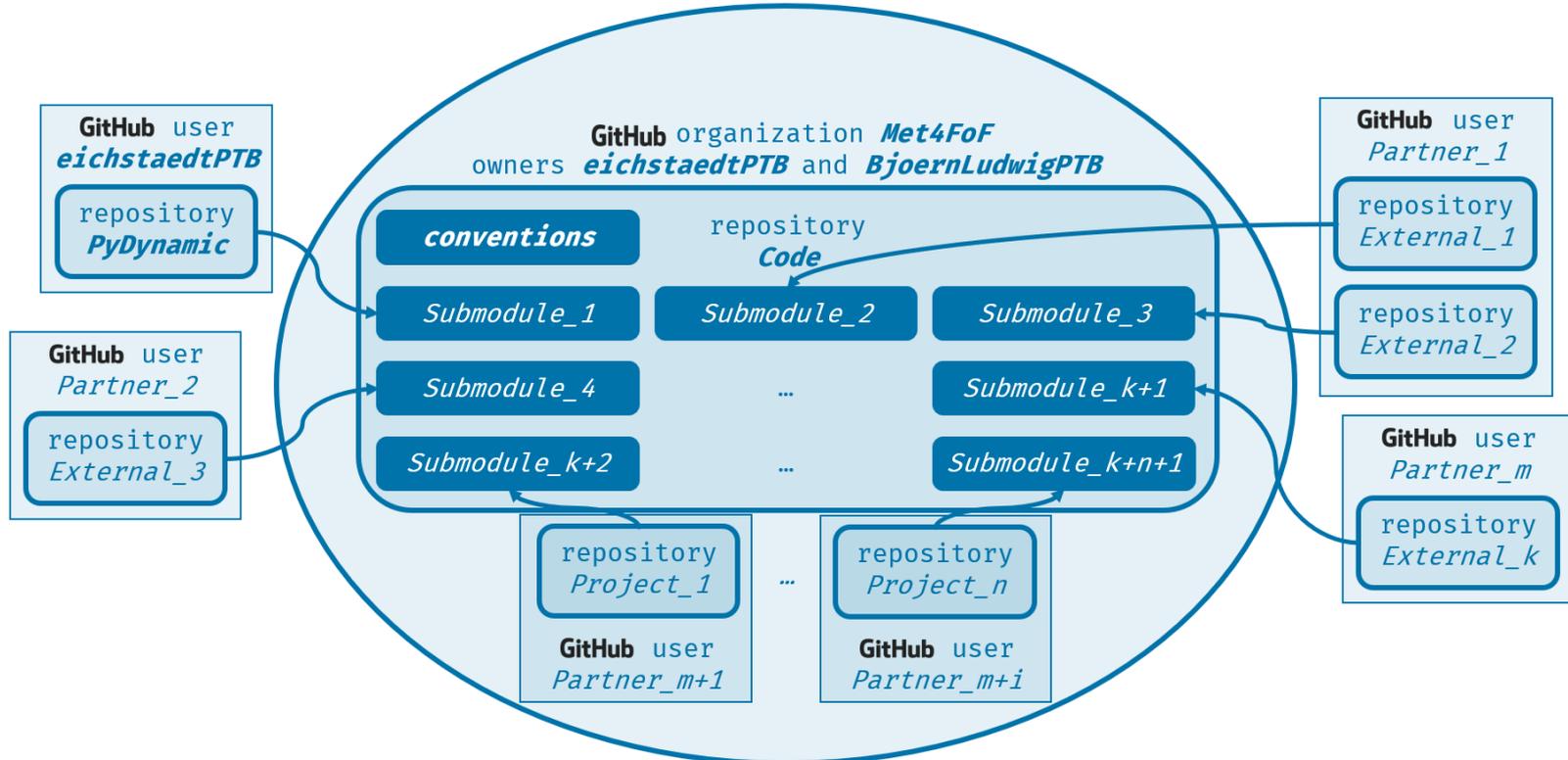
Where do we collect the code?

Met4FoF* repository on *GitHub  <https://omicro.no.com/> **contains Information on**

- Initial Git setup
- All important Git tasks
- Code architecture
- Coding conventions

... plus a basic Git  <https://git-scm.com/> glossary.

How is the code structured?



Legend:

italic

boldAndItalic

virtual

existing



name of GitHub **organization** / **user** / **repository** / **folder**

What has been done?



Coding conventions

Met4FoF / Code

Watch 0

Unstar 1

Fork 1

Code

Issues 0

Pull requests 0

Projects 1

Wiki

Security

Insights

Settings

Branch: master

Code / conventions /

Create new file

Upload files

Find file

History

BjoernLudwigPTB Include commit message style into conventions

Latest commit 10c160b on Feb 18

..

images

Rename folder guides/ and update links

5 months ago

README.md

Adapt lint conventions/README.md

5 months ago

coding_conventions.md

Include commit message style into conventions

4 months ago

README.md

What has been done?



Coding conventions

EMPIR project 17IND12 *Met4FoF* coding conventions

These coding conventions apply to all code and software written for the project and will constantly be extended as the project evolves and more code is written.

Design

1. All lines in code files should not exceed 80 characters.
2. Names for modules, classes, methods and functions should be speaking and explicitly represent the content.
3. The use of global variables should be avoided where possible.

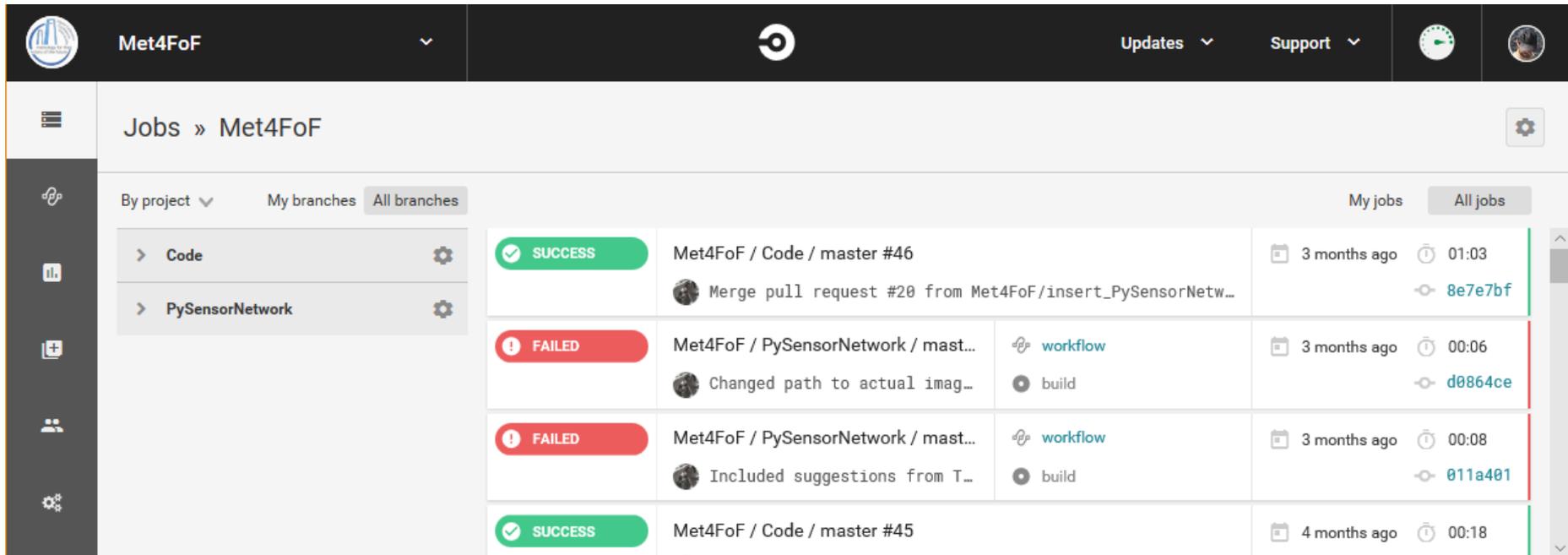
What has been done?

Code writing has started in Saarbrücken, Berlin, Brunswick and Cambridge

- Consensus about Python as major language 
- Code is organized to leave ownership and responsibility with writers
- Coding conventions have been published
- Two researchers will provide tutorials on Python between 5/ and 10/2019
- Basic CI/CD pipeline initialized

CI/CD pipeline in *Met4FoF*

CircleCI as main component



Met4FoF

Jobs » Met4FoF

By project ▾ My branches All branches

My jobs All jobs

Job Name	Status	Workflow	Build	Time	Link
Met4FoF / Code / master #46	SUCCESS			01:03	8e7e7bf
Met4FoF / PySensorNetwork / mast...	FAILED	workflow	build	00:06	d0864ce
Met4FoF / PySensorNetwork / mast...	FAILED	workflow	build	00:08	011a401
Met4FoF / Code / master #45	SUCCESS			00:18	

CircleCI configuration is part of the central code

```
1  # Python CircleCI 2.0 configuration file
2  #
3  # Check https://circleci.com/docs/2.0/language-python/ for more details
4  #
5  version: 2
6  jobs:
7    build:
8      docker:
9        # specify the version you desire here
10       # use `~browsers` prefix for selenium tests, e.g. `3.6-browsers`
11       - image: circleci/python:3.6
12
```

What are we up to?

Get everything working smoothly

- Continue to introduce code
- Assist in writing tests and documentation
- Assist in setting up individual pipelines
- Enhance the central pipeline
 - Lint READMEs and other documentation
 - Review code quality

Take home messages

- Be clear in the mission
- Be patient in the implementation
- Get everybody involved
- Deliver the basics and starting points
- Keep driving
- Make the benefits perceptible

Information and references

- <https://ptb.de>
- <https://digital.ptb.de>
- <https://github.com/Met4FoF/Code>
- <https://met4fof.eu>
- <https://circleci.com/gh/Met4FoF>



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