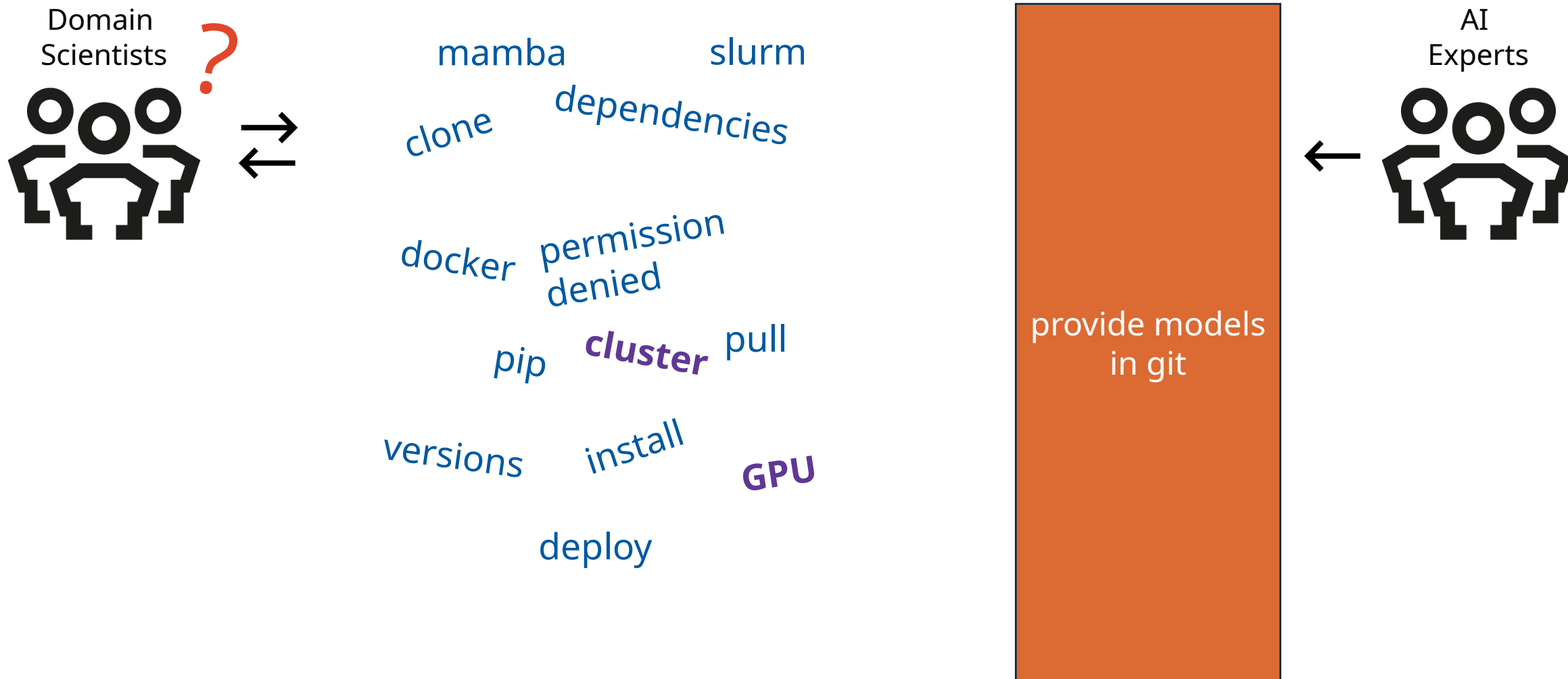


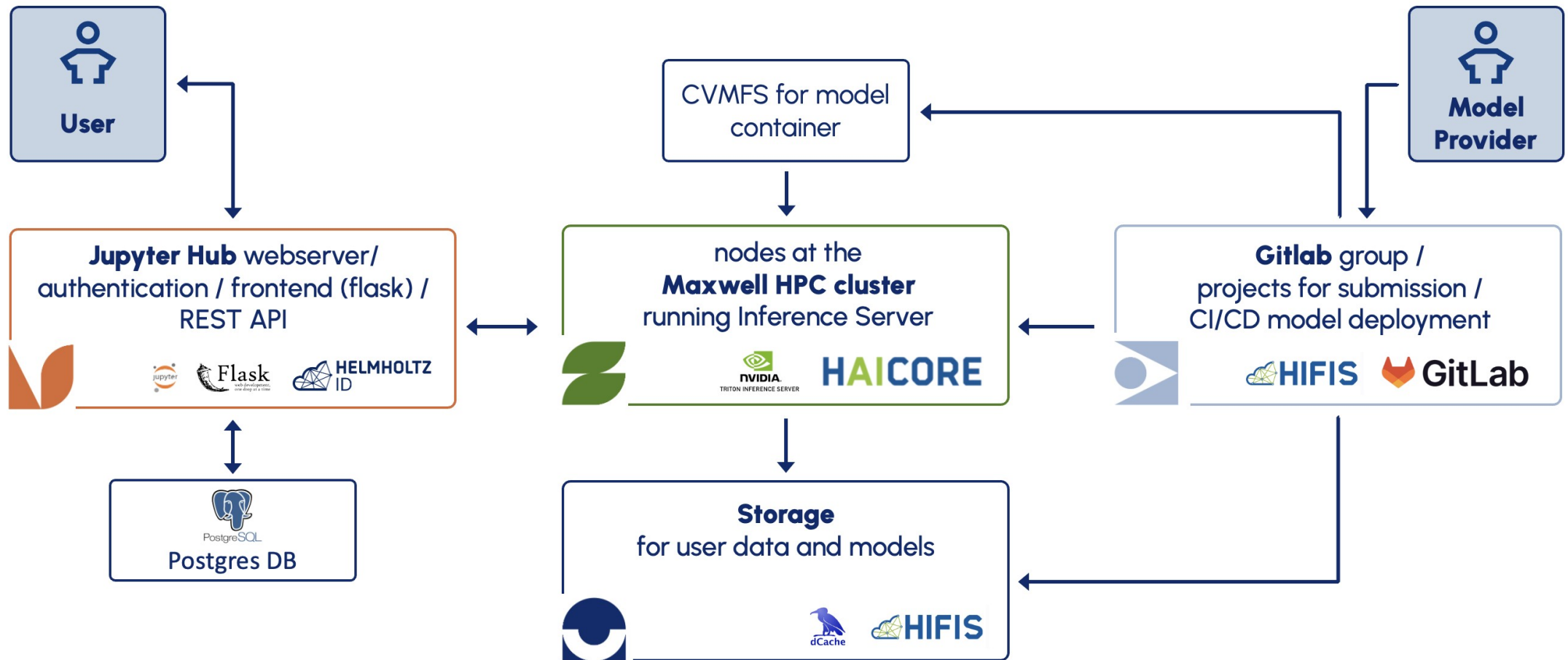
HELMHOLTZ MODEL ZOO

Hans Werners, Engin Eren, Philipp Heuser





Helmholtz Model Zoo



Who can use the models?

Only colleagues from Helmholtz can use it (and members of a Helmholtz ID VO)

How can I run an inference?

- Use the webinterface.
- Use a REST API

What is about my data (user)?

- You upload the data to a folder owned by you in dcache via the webinterface.
- You own your data, and it does not leave Helmholtz.
- You can also use the documented ways to upload data to dcache via rclone, webdav, etc.
(recommended for large datasets)
- You can upload a reasonable amount of data (probably not PB, but a few TB could be fine).
- We will delete all your data after 3 month, or so? (Not entirely defined yet)

4



HELMHOLTZ MODEL ZOO

Pilot Phase (Beta Test)

The Helmholtz Model Zoo is currently only in the **Pilot Phase/Beta Test!**

What does this mean?

You are here as an early tester. The Model Zoo is generally speaking working. There are some features we are still working on. **The Model Zoo may undergo updates, changes and short interruptions at any time. (Sorry)**

Nevertheless, we welcome you here and ask for your input to make the Helmholtz Model Zoo a great tool for scientific endeavours. Please do not hesitate to provide your models and to test the website! We are looking forward to any bug report, comment or suggestion at hmz-admin@desy.de

Welcome to the Helmholtz Model Zoo. HMZ is offering scientific deep learning models for inference in the browser. Here you find the tools Helmholtz members trained to conduct the *research for grand challenges*.

The content of the Helmholtz Model Zoo is provided by experts from the association, and when you are affiliated to one of the Helmholtz Centers, you are invited to login with your institutional credentials and use them!

Start

For Model Providers

If you are a Machine Learning expert yourself, and are looking for a way to share your model in the Helmholtz Model Zoo, find a guide [here](#).

Model overview

Selecting a model redirects you to the model-specific input-page.



inpainting-lama-onnx25

by Roman Suvorov, Elizaveta Logacheva, Anton Mashikhin, Anastasia Remizova, Arsenii Ashukha, Aleksei Silverstrov, Naejin Kong, Harshith Goka, Kiwoong Park, Victor Lempitsky

Adaptation from HF --> <https://huggingface.co/Carve/LaMa-ONNX>

More →

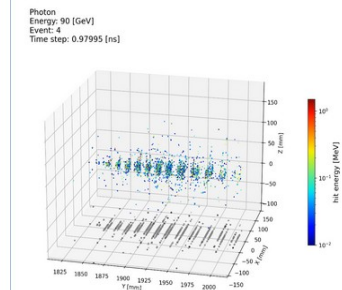


Mnist Demo

by Helmholtz Model Zoo Team

This is a demo model for the model zoo. It is a simple MNIST model. Don't judge about its...

More →

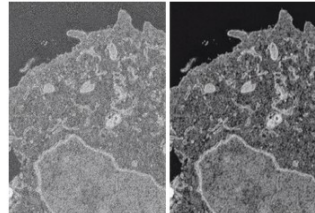


CaloClouds

by Anatolii Korol, Henry Day-Hall, Thorsten Buss,
Frank Gaede, Erik Buhmann, Gregor Kasieczka, William
Korcari, Katja Krüger, Peter McKeown

Accurate simulation of particle physics experiments is fundamental for comparing theoretical...

More →



Noise2void

by

Noise2Void is a self-supervised denoising method that works by randomly masking pixels in an...

More →

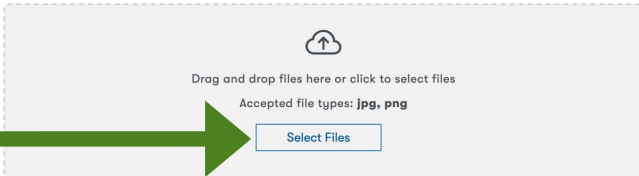
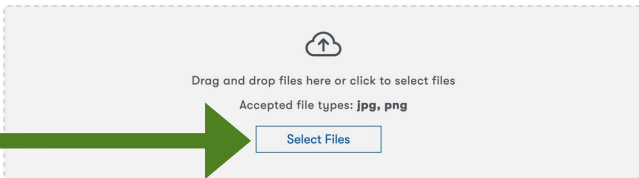
14



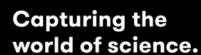
Description

Upload Files

Select Files from Upload Directory



Submit



HELMHOLTZ

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Description

energy

50.00

Incoming energy of the particle

eta

60.00

the incidence angle of in the incoming particle

phi

0.00

Azimuthal angle

nshowers

100.00

Number of showers

Submit

Model Zoo for the User



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MODEL ZOO

HomeModelsMy JobsFor Model ProvidersAbout

Job inpainting-lama-onnx25

Status

Model: inpainting-lama-onnx25

Input: /pnfs/desy.de/hifis-storage/HMZ/user//pheuser/upload/dataset_inpainting-lama-onnx25_2025-06-24_11-58-57

Status: COMPLETED

Start: 2025-06-24 11:58:58

End: 2025-06-24 11:59:04

Results / Download

Results

Download all result files as one zip:

output1 files

inpainting-lama-onnx25_prediction_day1.jpg

ViewDownload

Logs

Here you can quickly scan some of the log files for information.

status_log

slurm_out

slurm_error

> This is the content of the logfile:

> /pnfs/desy.de/hifis-storage/HMZ/user/pheuser/result/result_inpainting-lama-onnx25_70790f15/logs/status_log.log

Done

Please cite:

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MODEL ZOO

HomeModelsMy JobsFor Model ProvidersAbout

Job CaloClouds

Status

Model: caloclouds

Input: /pnfs/desy.de/hifis-storage/HMZ/user//eren/upload/dataset_caloclouds_2025-07-03_09-46-11

Status: COMPLETED

Start: 2025-07-03 09:46:13

End: 2025-07-03 09:49:08

Results / Download

Results

Download all result files as one zip:

output_file1 files

caloclouds_prediction_input.root

ViewDownload

[1]: import uproot

file = uproot.open("caloclouds_prediction_input.root")

[2]: print(file.keys())

['Events;1']

[22]: import matplotlib.pyplot as plt

plt.scatter(x,z,s=3)

[13]

[22]: <matplotlib.collections.PathCollection at 0x148de86817d0>

[13]

Here you can quickly scan some of the log files for information.

slurm_out

slurm_error

eren/result/result_caloclouds_c293fd2a/logs/status_log.log

2025 | HELMHOLTZ IMAGING |

For model providers



Who can provide models?

All scientists in Helmholtz can login via the Helmholtz ID and provide their models.

What kind of models?



ONNX



PyTorch



TensorFlow



Which hardware?

Our nodes are provided by HAICORE, run at DESY, each equipped with 4 Nvidia L40S.



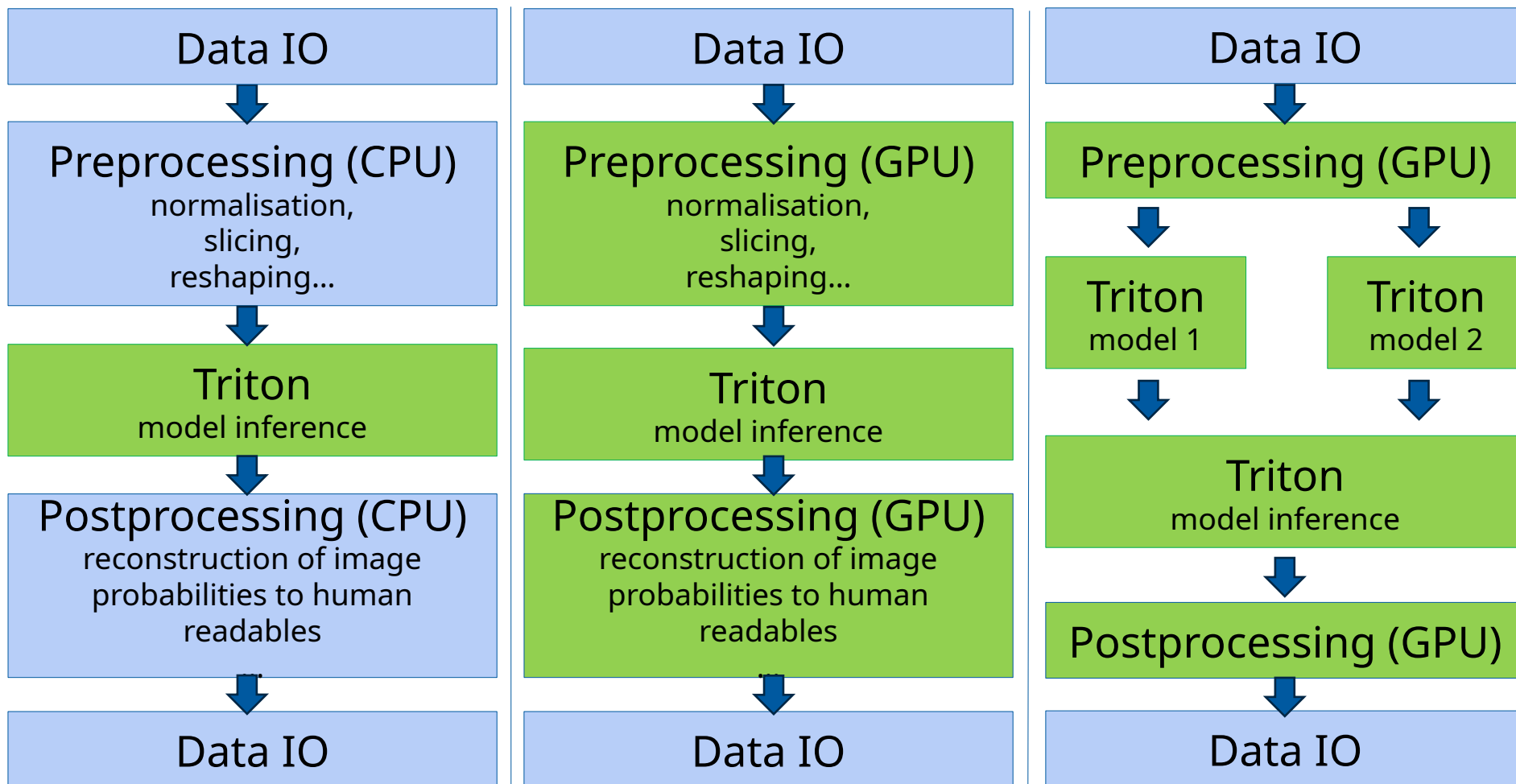
Can I make my model “private”?

Yes, you will be able to give the usernames of people who are entitled to use your model? (Via a Helmholtz ID VO)

What do I have to do?

- We provide you with a template in the (DESY)-Gitlab.
- We try to get as much as possible of your shoulders, keeping a maximum of flexibility
- You have to add your model and implement the necessary for pre- and postprocessing
- You have to fill in a form for the necessary meta data (some technical details, description, publication)

Pre/Post Processing & Triton



```
model > particleseg3d > particleseg3d_ensemble > config.pbtxt
1  name: "particleseg3d_ensemble"
2  platform: "ensemble"
3  max_batch_size: 8
4
5  input [
6    {
7      name: "input"
8      data_type: TYPE_FP32
9      dims: [ 1, 80, 192, 160 ]
10   }
11 ]
12
13  output [
14    {
15      name: "output"
16      data_type: TYPE_FP32
17      dims: [ 3, 80, 192, 160 ]
18    }
19 ]
20
21  ensemble_scheduling {
22    step [
23      {
24        model_name: "particleseg3d_fold0"
25        model_version: -1
26        input_map {
27          key: "input"
28          value: "input"
29        }
30        output_map {
31          key: "output"
32          value: "fold0_logits"
33        }
34      },
35      {
36        model_name: "particleseg3d_fold1"
37        model_version: -1
38        input_map {
39          key: "input"
40          value: "input"
41        }
42        output_map {
43          key: "output"
44          value: "fold1_logits"
45        }
46      }
47    ]
48  }
```

Model Zoo for the Model Provider



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MODEL ZOO

HomeModelsMy JobsFor Model ProvidersAbout

Add a new model to Helmholtz Model Zoo

Disclaimer

Before you start creating a new model, please read! By creating a new model repository here, you agree to the following:

I agree that Helmholtz Imaging offers this model and the provided routines for pre- and postprocessing as a service for all colleagues of any of the Helmholtz Centers, independent of the actual license chosen for this model. For the usage of the Helmholtz Model Zoo the rules as listed in the [Terms of Use](#) for Helmholtz cloud services apply.

Helmholtz Imaging will operate the Helmholtz Model Zoo with best effort, but without any guarantee. Operation of the Helmholtz Model Zoo is without warranty of any kind, express or implied, including but not limited to the warranties of merchantability, fitness for particular purpose and noninfringement. In no event shall Helmholtz Imaging be liable for any claim, damages or other liability, whether in action of contract, tort or otherwise, arising from, out or in connection with the model and software, or the use or other dealings in the service.

I confirm that I hold the right to provide this model and it's accompanying files (images, templates etc.) to the colleagues of any of the Helmholtz Centers, and that any linked or imported software and libraries have a sufficiently permissive license.

I confirm that the provided model has only been trained on data, which allows for the distribution of this model.

Helmholtz Imaging will show/link the licenses you select for your contribution on the Helmholtz Model Zoo web interface. Helmholtz Imaging will not enforce your license.

You can restrict the access to the model to individual colleagues by providing their usernames. **This restricts only the access to the model itself, it is the file with the trained weights. The functions you provide for pre- or postprocessing are still visible for anyone! Therefore you can use a more restrictive license for the model, but not for any functions you need around it!**

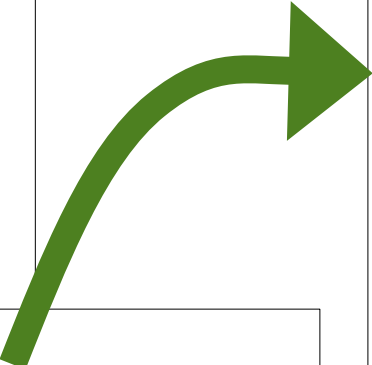
For handling the containers with the pre- and postprocessing functions we are using [CernVM-FS](#). This implied that anyone who can mount the CernVM-FS, can get access to the container images containing your pre- and postprocessing functions, but not the model files.

How do I add a model?

Contributed models must live in the DESY gitlab and follow a very specific structure to work within the modelzoo. To make things easier for you, we provide you with a model template, you only need to fill out. We also provide tests, which must succeed, in order for your model to be deployed.

To get started, follow these steps:

- 1) [Find out your DESY gitlab user ID](#).
- 2) Fill out [this form](#).
- 3) You get an email with the link to the new project repository, where everything is already set up for you.
- 4) Generate the meta-data json file for your project. Most of the information we need to compile the website and to get as much coding as possible of your



Create a repository for you model

To create a new git project for HMZ, you must be known to the [DESY gitlab](#). Therefore, please log in at least once with your Helmholtz ID to the DESY gitlab. Once logged in, go to [user profile](#), under 'Main Settings' you will find your gitlab User ID, which you need here.

model name

my_new_model

Name of new HMZ Model Project

gitlab user id

xxx

Your DESY gitlab user ID

Submit

M

my_new_model

main

my_new_model /

+

Find file

Edit

Code

Merge branch 'philipp.heuser-main-patch-99074' into 'main'

...

d2648ff9

History

Name	Last commit	Last update
.gitlab/ci	updating CI Pipeline to be build on main...	2 days ago
example_data	Documentation	5 months ago
images	copy meta json in the working dir of the...	3 days ago
model	postprocessor template	2 weeks ago
server_files	change to not count the mask and mak...	2 days ago
tests	Created template structure	8 months ago
.gitignore	adding pre-commit file	4 months ago
.gitlab-ci.yml	copy meta json in the working dir of the...	3 days ago
.pre-commit-config.yaml	cleaned_inference.py	4 months ago
Dockerfile	copy meta json in the working dir of the...	3 days ago
README.md	adding pre-commit file	4 months ago
new_model.md	Edit new_model.md	10 hours ago

4



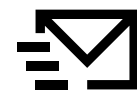
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Christian Voss
Elena Gapon
Frank Schlünzen
Johannes Reppin
Kars Ohrenberg
Lusine Yakovleva
Moritz Hamminger
Patrick Fuhrmann
Sven Sternberger
Thomas Hartmann
Tim Wetzel
Uwe Jandt
Yves Kemp
Alexander Trautsch
Stefan Bujack
Karol Szustakowski

Talk to us!



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