ePIC Hackathon

Simon Gardner, Dmitry Kalinkin, Karthik Suresh

January 2025

Purpose of this Hackathon

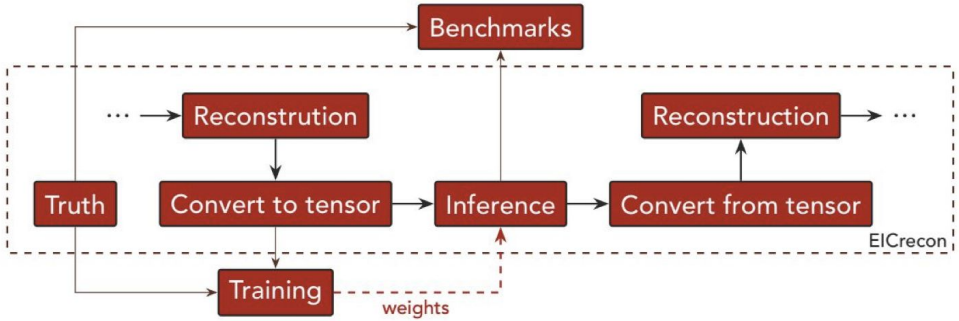
For you to learn how to deploy Machine Learning into ePIC reconstruction.

It's not just that one needs to come up with a model (usually using Python tools).

Need to be able to deploy!

Integration of trained models into EICrecon (written C++) is done via ONNX format. And the training has to take EDM4eic files as input, as that is our standard format for reconstruction.

Some motivation is given in the past presentations: 1, 2



Challenges

We have prepared 2 challenges for this hackathon.

1. Low-Q2 Tagger - Regression to reconstruct initial electron momentum from a detected track transported through beamline components
2. DIRC - Classification/PID of pions and kaons based on the distribution of the scattered photons detected on the sensors.

Further information and detailed instructions can be found here:

https://hedgedoc.kalinkin.science/s/zbt6G6eKc

And the codes are posted at https://github.com/eic/epic-hackathon-2025

These can be completed both during the session at the ePIC collaboration meeting or carried out at your leisure until Tuesday, January 28th.

Submitting

You must be a member of the https://github.com/eic/ organization. If not, please DM Dmitry Kalinkin (~veprbl) on Mattermost. We kindly request that your GitHub profile reflects your full name and affiliation.

Use the submission portal at https://epichackathon2025.pythonanywhere.com

Simply login using your GitHub credentials in the app. The app requests for read access for your organizations (to verify your membership).

Once logged in you can look at your Profile and make changes to some profile information if needed.

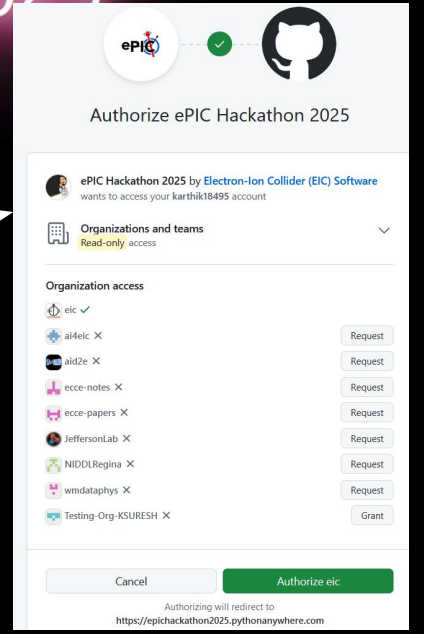
Make sure to have your solution files only in .edm4eic.root format within 20MB

If you have any question or face difficulties contact ~hackathon-2025 on Mattermost.

Home | Submit | All Participants | Login

1. Login using Github

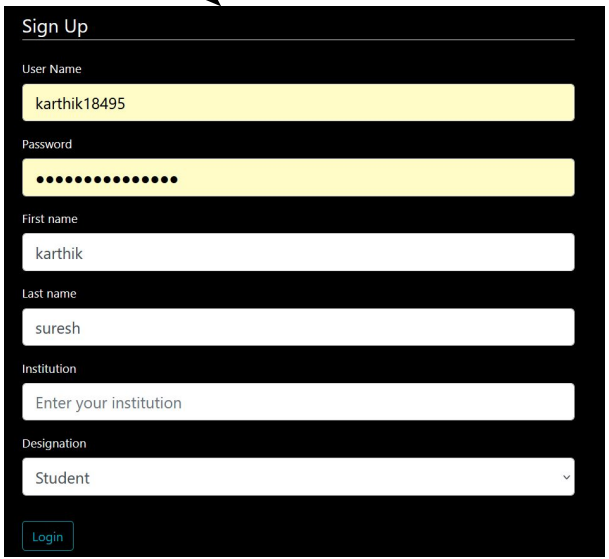
ePIC Hackathon 2025

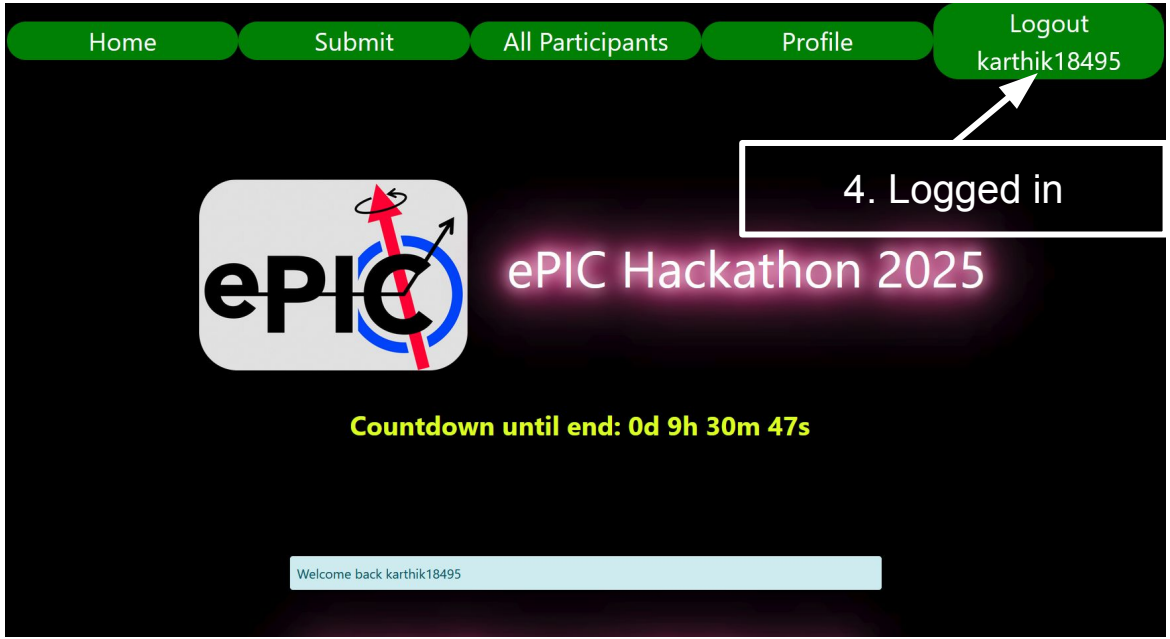


2. Authenticate

Hackathon Leaderboard

3. Give additional details for sign up (One time)





The leaderboard refreshes every 10 seconds

You can check out participants as well in All Participants tab

Home | Submit | All Participants | Profile | Logout karthik18495

5. Submit solutions

The submission is not open yet. Please wait until Jan 23, 9.00 am Rome time

Question Submission portal

User name

karthik18495

Full Name

karthik suresh

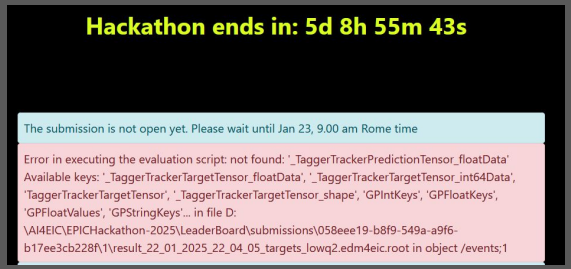
Submitting Solution for Question

Select the Question

- Select the Question
- Question 1: LowQ2
- Question 2: DIRC

Evaluate Results

If the submission fails You can check out the error right in the flash message



Also, You can view the response of evaluation in Profile tab as well. Scroll down to see the list of submissions and the evaluated remarks for the full logs.

QUESTION NUMBER	SCORE	SUBMISSION TIME	REMARKS	EVALUATED REMARKS
1		2025-01-22 22:02		Evaluation Error

Questions?

Hackathon-2025

Please ask in ~hackathon-2025 on Mattermost.

You are welcome to work in teams and discuss among yourselves.

EICrecon integration checklist

Not something you should need to directly worry about during this hackathon

- Create onnx file with a script that will be possible to reproduce on GitHub CI
- Add the onnx file to the epic-data repository eic/epic-data: Supplementary files for Geometry Description of the ePIC Experiment
- Add a link to the specific epic-data commit to the epic calibrations.xml file epic/compact/calibrations.xml at main · eic/epic
- This is now downloaded/linked locally when EICrecon is run so can be accessed through algorithms
- Make algorithms in EICrecon which convert the input data into edm4eic::Tensors and edm4eic::Tensors back to the output data. Using the available onnx inference factory to carry out the inference. EICrecon/src/factories/meta/ONNXInference_factory.h at main · eic/EICrecon

Other neural network exchange formats, than onnx, are available but should be strongly justified for inclusion.