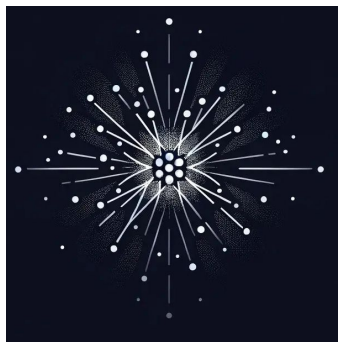




FAIR Universe



Fair Universe

Higgs Uncertainty Challenge

Codabench Tutorial



1. Login or Create Account on Codabench <https://www.codabench.org/>

[Benchmarks](#)[Resources](#)[Queue Management](#)[Login](#)[Sign-up](#)

FAIR UNIVERSE - HIGGS UNCERTAINTY CHALLENGE

9 PARTICIPANTS

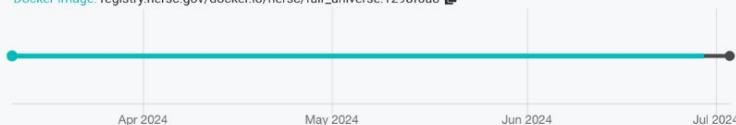
10 SUBMISSIONS

ORGANIZED BY: FAIR Universe

CURRENT PHASE ENDS: 3 July 2024 At 05:00 GMT+5

CURRENT SERVER TIME: 28 June 2024 At 15:08 GMT+5

Docker image: registry.nersc.gov/docker/nersc/fair_universe:1298f0a8

[Get Started](#)[Phases](#)[My Submissions](#)[Results](#)[Forum](#)[Overview](#)[Evaluation](#)[Data](#)[Starting Kit](#)[Terms](#)

Overview

Codabench Walkthrough tutorial: [Tutorial Slides](#)

Introduction

In 2012, the Nobel-prize-winning discovery of the Higgs Boson by the ATLAS and CMS experiments at the Large Hadron Collider (LHC) at CERN in Geneva, Switzerland was a major milestone in the history of physics. However, despite the validation it provided of the Standard Model of particle physics (SM), there are still numerous questions in physics that the SM does not answer. One promising approach to uncover some of these mysteries is to study the Higgs Boson in great detail, as the rate of Higgs Boson production and its decay properties may hold the secrets to the nature of dark matter and

2. Competition Flow

Phase 1

Phase 2



Get Public Data



Train model



Prepare zip with model.py
and pre-trained model



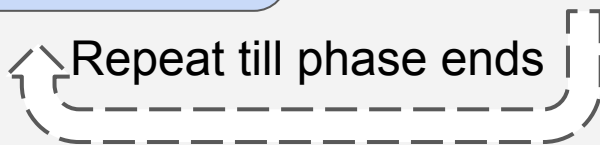
Make sure to not
re-train in *fit* function



Submit your model to the
competition website



Leaderboard is updated
once a day



Compete with other
best submissions
and win the
competition



Best submission is
taken to *Phase 2*

3. Register in the Competition


Search Competitions

Benchmarks

Resources

Queue Management

isha




FAIR UNIVERSE - HIGGS UNCERTAINTY CHALLENGE

9 PARTICIPANTS

10 SUBMISSIONS

ORGANIZED BY: FAIR Universe
CURRENT PHASE ENDS: 3 July 2024 At 05:00 GMT+5
CURRENT SERVER TIME: 28 June 2024 At 15:11 GMT+5
Docker image: registry.nersc.gov/docker.io/nersc/fair_universe:1298f0a8



Get Started

Phases

My Submissions

Results

Forum

?


You have not yet registered for this competition.

To participate in this competition, you must accept its specific [terms and conditions](#).

This competition **requires approval** from the competition organizers. After submitting your registration request, an email will be sent to the competition organizers notifying them of your request. Your application will remain pending until they approve or deny it.

☐ I accept the terms and conditions of the competition.

Register



4. Get Public Data



FAIR UNIVERSE - HIGGS UNCERTAINTY CHALLENGE

10 PARTICIPANTS

10 SUBMISSIONS

ORGANIZED BY: FAIR Universe
CURRENT PHASE ENDS: 3 July 2024 At 05:00 GMT+5
CURRENT SERVER TIME: 28 June 2024 At 15:13 GMT+5
Docker image: registry.nersc.gov/docker.io/nersc/fair_universe:1298f0a8



Get Started

Phases

My Submissions

Results

Forum



Overview

Evaluation

Data

Starting Kit

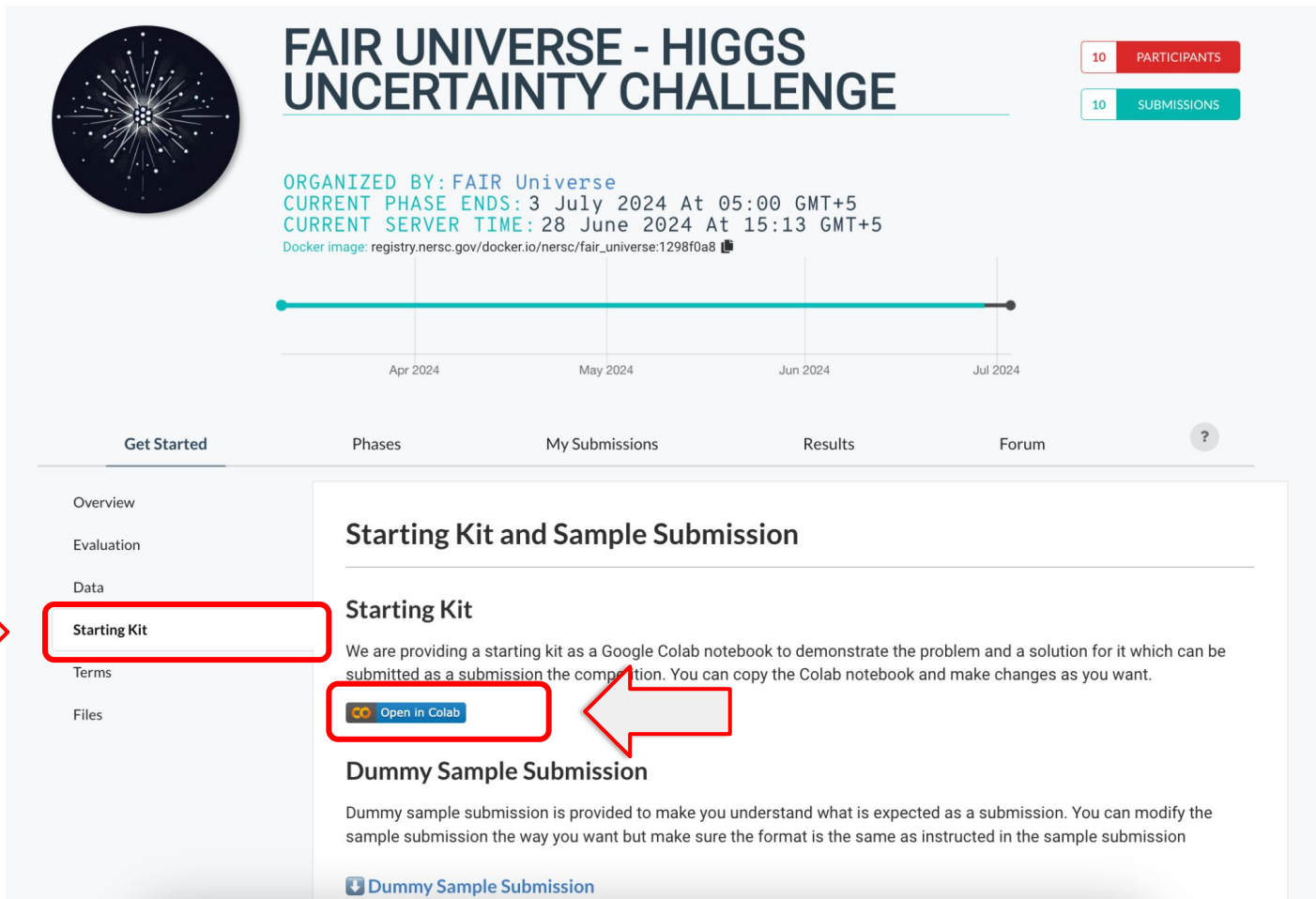
Terms

Files

Download	Phase	Task	Type	Size
Neurpis_Public_Data		-	Public Data	4.67 GB



5. Check out the starting kit



FAIR UNIVERSE - HIGGS UNCERTAINTY CHALLENGE

ORGANIZED BY: FAIR Universe
CURRENT PHASE ENDS: 3 July 2024 At 05:00 GMT+5
CURRENT SERVER TIME: 28 June 2024 At 15:13 GMT+5
Docker image: registry.nersc.gov/docker.io/nersc/fair_universe:1298f0a8

10 PARTICIPANTS
10 SUBMISSIONS

Apr 2024 May 2024 Jun 2024 Jul 2024

Get Started Phases My Submissions Results Forum

Overview
Evaluation
Data
Starting Kit
Terms
Files

Starting Kit and Sample Submission

Starting Kit

We are providing a starting kit as a Google Colab notebook to demonstrate the problem and a solution for it which can be submitted as a submission the competition. You can copy the Colab notebook and make changes as you want.

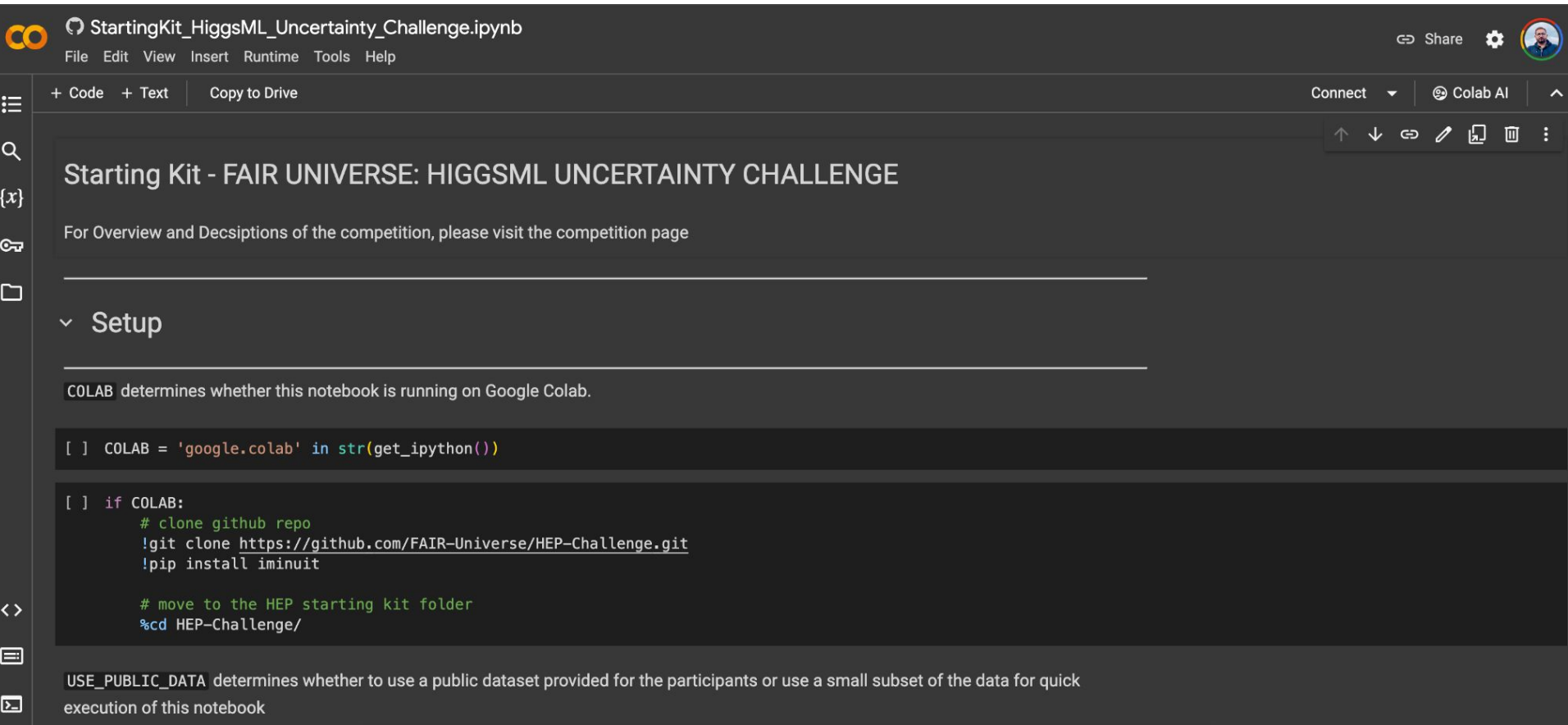
[Open in Colab](#)

Dummy Sample Submission

Dummy sample submission is provided to make you understand what is expected as a submission. You can modify the sample submission the way you want but make sure the format is the same as instructed in the sample submission

[Dummy Sample Submission](#)

6. Starting kit as a Google Colab Notebook



The screenshot shows a Google Colab notebook interface. At the top, the title bar reads 'StartingKit_HiggsML_Uncertainty_Challenge.ipynb'. Below it is a menu bar with 'File', 'Edit', 'View', 'Insert', 'Runtime', 'Tools', and 'Help'. On the right side of the title bar are 'Share', a settings gear, and a user profile icon. Below the menu bar is a toolbar with '+ Code', '+ Text', and 'Copy to Drive'. On the far right of the toolbar are 'Connect', 'Colab AI', and an upward arrow. The main content area has a dark background. It starts with a large heading 'Starting Kit - FAIR UNIVERSE: HIGGSML UNCERTAINTY CHALLENGE'. Below this is a paragraph: 'For Overview and Descriptions of the competition, please visit the competition page'. This is followed by a section header 'Setup'. Below 'Setup' is a paragraph: 'COLAB determines whether this notebook is running on Google Colab.' Then there is a code cell with the following Python code:

```
[ ] COLAB = 'google.colab' in str(get_ipython())
```

```
[ ] if COLAB:
```

```
    # clone github repo
```

```
    !git clone https://github.com/FAIR-Universe/HEP-Challenge.git
```

```
    !pip install iminuit
```



```
    # move to the HEP starting kit folder
```

```
    %cd HEP-Challenge/
```

At the bottom of the notebook, there is a text block: 'USE_PUBLIC_DATA determines whether to use a public dataset provided for the participants or use a small subset of the data for quick execution of this notebook'.

7. Download Dummy Submission

FAIR UNIVERSE - HIGGS UNCERTAINTY CHALLENGE

10 PARTICIPANTS
10 SUBMISSIONS

ORGANIZED BY: FAIR Universe
CURRENT PHASE ENDS: 3 July 2024 At 05:00 GMT+5
CURRENT SERVER TIME: 28 June 2024 At 15:13 GMT+5
Docker image: registry.nersc.gov/docker.io/nersc/fair_universe:1298f0a8

Timeline: Apr 2024, May 2024, Jun 2024, Jul 2024

Navigation: Get Started, Phases, My Submissions, Results, Forum

Left Sidebar: Overview, Evaluation, Data, **Starting Kit**, Terms, Files

Main Content: **Starting Kit and Sample Submission**

Starting Kit
We are providing a starting kit as a Google Colab notebook to demonstrate the problem and a solution for it which can be submitted as a submission the competition. You can copy the Colab notebook and make changes as you want.
[Open in Colab](#)

Dummy Sample Submission
Dummy sample submission is provided to make you understand what is expected as a submission. You can modify the sample submission the way you want but make sure the format is the same as instructed in the sample submission
[Dummy Sample Submission](#)

8. Submit Dummy Submission

[Get Started](#)[Phases](#)[My Submissions](#)[Results](#)[Forum](#)[?](#)

Test Phase

Number of submissions used for the day

0 out of 5

Number of total submissions used

1 out of 100

Submission upload

Metadata or Fact Sheet

Method Name: *
Dummy Submission

Selected Tasks

Submit as: ?
Yourself

HiggsML_Dummy_Submission.zip

9. Check results in the leaderboard

Updated approx once per day for full competition

Get Started Phases My Submissions **Results** Forum ?

Phase 1 Phase 2

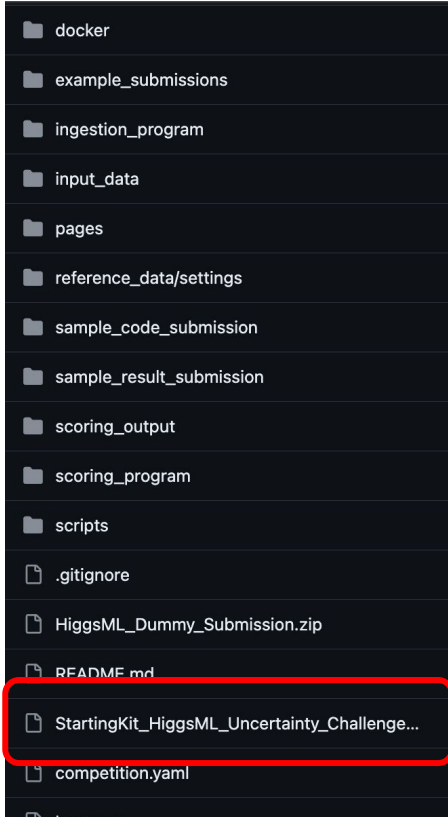
Filter Leaderboard by Columns

Results

Task:				Fact Sheet Answers	ACAT TASK 4X50 PHASE1				
#	Participant	Entries	Date	Method Name	Quantile Score	Interval	Coverage	Run Time (mins)	Detailed Results
1	cjh1	3	2024-03-06 19:47	test	2.755	0.063	0.625	1.0	
2	ragansu	1	2024-03-06 10:36	saved NN	2.631	0.066	0.6	9.0	
3	FAIR Universe	2	2024-03-06 10:36	test xgb_saved	2.363	0.064	0.59	1.0	
4	FAIR Universe	2	2024-03-06 10:25	test xgb_saved	0.704	0.068	0.565	1.0	
5	cjh1	3	2024-03-06 20:40	test	-3.0	0.057	0.475	1.0	
6	saschadief	2	2024-03-06 16:29	test	-4.816	0.0	0.0	0.0	
7	cjh1	3	2024-03-06 20:24	test	-4.989	0.059	0.385	1.0	

10. Access Starting Kit Notebook on Github

<https://github.com/FAIR-Universe/HEP-Challenge>



11. Checkout example submissions


https://github.com/FAIR-Universe/HEP-Challenge/tree/master/example_submissions


 Pytorch_model.zip

 README.md

 Tensorflow_model.zip

 Tensorflow_saved.zip

 xgb_model.zip

 xgb_saved.zip

12. Submit Pre-Trained Models

- Use the code structure from Dummy Sample Submission
- Use Public data to train your models
- Submit your submissions with pre-trained model file included in the zip

13. Get in touch

Join **#higgsml-uncertainty-challenge-spring-24** channel in the FAIR Universe slack workspace

https://join.slack.com/t/fairuniverse/shared_invite/zt-2dt9ovrp1-jvi0DnCK9jzL3VGrdwYNMA



<https://fair-universe.lbl.gov/>

Competition Flow

Phase 1

Phase 2



Get Public Data



Train model



Prepare zip with model.py
and pre-trained model



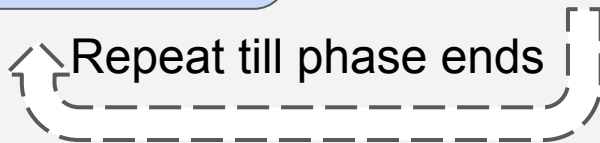
Make sure to not
re-train in *fit* function



Submit your model to the
competition website



Leaderboard is updated
once a day



Compete with other
best submissions
and win the
competition



Best submission is
taken to *Phase 2*