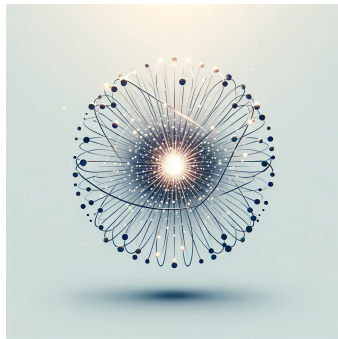




FAIR Universe



# Fair Universe

## HiggsML Uncertainty Challenge

# Codabench Tutorial



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

The screenshot shows the Codabench website interface for the 'FAIR UNIVERSE - HIGGSML UNCERTAINTY CHALLENGE'. The top navigation bar includes a search bar, 'Benchmarks', 'Resources', 'Queue Management', 'Login', and 'Sign-up' links. The 'Login' and 'Sign-up' links are highlighted with a red box, and a large red arrow points upwards towards them. The main content area features a circular logo on the left, the challenge title in the center, and statistics on the right: 8 PARTICIPANTS and 39 SUBMISSIONS. Below the title, it states 'ORGANIZED BY: FAIR Universe', 'CURRENT PHASE ENDS: 31 March 2024 At 05:00 GMT+5', and 'CURRENT SERVER TIME: 5 March 2024 At 15:05 GMT+5'. A timeline shows the phase ending in March 2024. The bottom navigation bar includes 'Get Started', 'Phases', 'My Submissions', 'Results', and 'Forum'. The left sidebar contains a menu with 'Overview', 'Evaluation', 'Data', 'Starting Kit', 'Example Estimators', 'Terms', and 'Files'. The main content area displays the 'Overview' section, which includes an 'Introduction' paragraph about the Higgs Boson discovery and the challenge's purpose.

**FAIR UNIVERSE - HIGGSML UNCERTAINTY CHALLENGE**

ORGANIZED BY: FAIR Universe  
CURRENT PHASE ENDS: 31 March 2024 At 05:00 GMT+5  
CURRENT SERVER TIME: 5 March 2024 At 15:05 GMT+5  
Docker image: nersc/fair\_universe:1298f0a8

8 PARTICIPANTS  
39 SUBMISSIONS

Mar 2024 Apr 2024

Get Started Phases My Submissions Results Forum ?


**Overview**

**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 other phenomena not explained by the SM.

The LHC collides protons together at high energy and at a high rate. Each proton collision produces many outgoing particles.

## 2. Download Dummy Submission




# FAIR UNIVERSE - HIGGSML UNCERTAINTY CHALLENGE

8 PARTICIPANTS

39 SUBMISSIONS

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CURRENT SERVER TIME: 5 March 2024 At 15:05 GMT+5  
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Get Started

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### 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](#)

### 3. Register in the Competition

Search Competitions

Benchmarks ▾ResourcesQueue Managementihsan




## FAIR UNIVERSE - HIGGSML UNCERTAINTY CHALLENGE

8 PARTICIPANTS

39 SUBMISSIONS

ORGANIZED BY: FAIR Universe  
CURRENT PHASE ENDS: 31 March 2024 At 05:00 GMT+5  
CURRENT SERVER TIME: 5 March 2024 At 15:07 GMT+5  
Docker image: nersc/fair\_universe:1298f0a8



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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. Submit Dummy Submission

Get Started

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Phase 1

Phase 2

Number of submissions used for the day

0 out of 5

Number of total submissions used

28 out of 100

Submission upload

Metadata or Fact Sheet

Method Name: \*


Dummy Submission

Submit as: ?


Yourself


HiggsML\_Dummy\_Submission.zip






## 5. Check results in the leaderboard




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


Phase 1   Phase 2   

 Filter Leaderboard by Columns ?

Results 								
Task:				Fact Sheet Answers	ACAT TASK V0.2.2			
#	Participant	Entries	Date	Method Name	Quantile Score	Interval	Coverage	Detailed Results
	FAIR Universe	10	2024-03-04 17:09	test	0.509	0.06	0.56	
	FAIR Universe	10	2024-03-01 18:26	test	0.381	0.068	0.56	




## 6. Check out the starting kit



# FAIR UNIVERSE - HIGGSML UNCERTAINTY CHALLENGE

ORGANIZED BY: FAIR Universe  
CURRENT PHASE ENDS: 31 March 2024 At 05:00 GMT+5  
CURRENT SERVER TIME: 5 March 2024 At 15:05 GMT+5  
Docker image: nersc/fair\_universe:1298f0a8



8 PARTICIPANTS

39 SUBMISSIONS

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### 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.

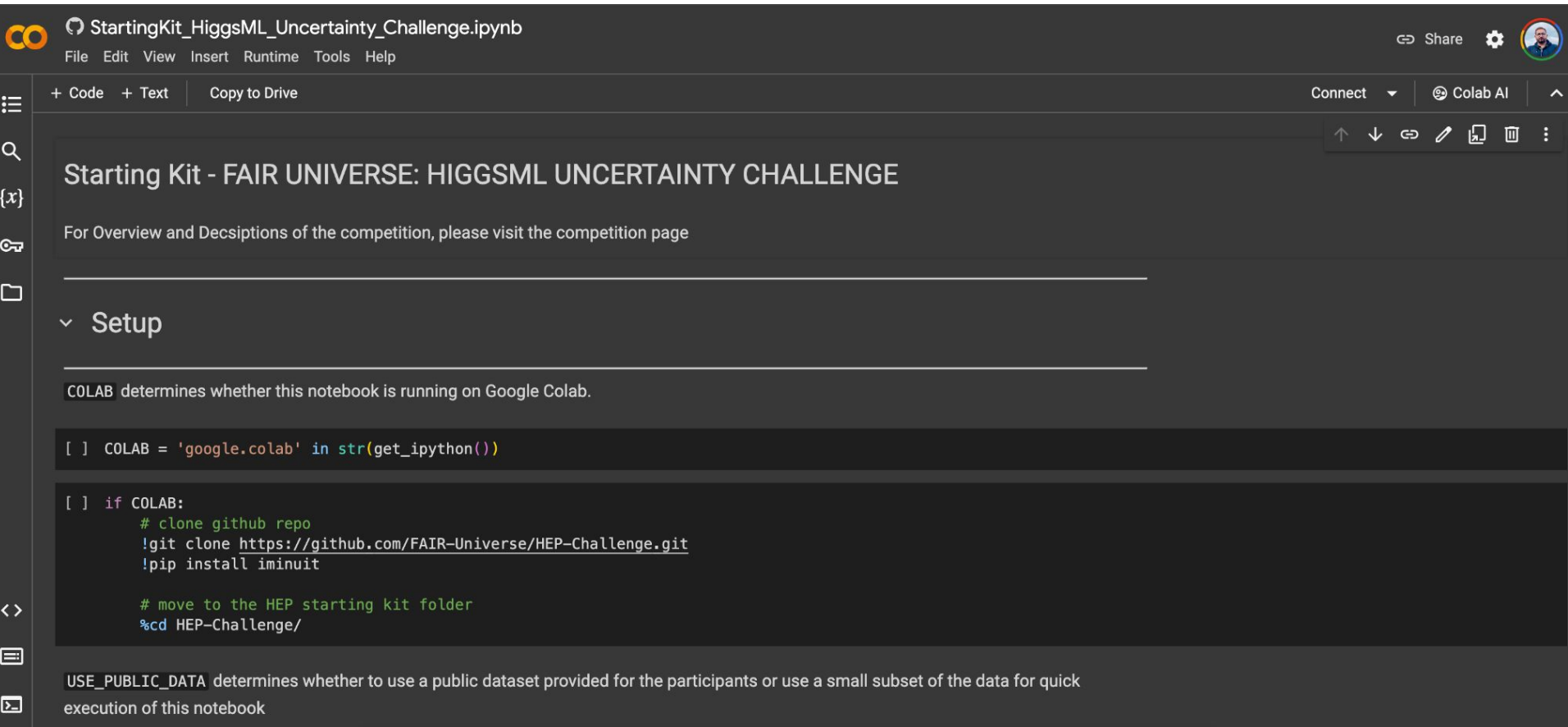
Open In Colab

#### 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](#)

## 7. 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 notebook 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 Decsptions 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 are two code blocks. The first code block contains: 

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

 The second code block contains: 

```
[ ] 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 is a final paragraph: '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'.

StartingKit\_HiggsML\_Uncertainty\_Challenge.ipynb

File Edit View Insert Runtime Tools Help

+ Code + Text Copy to Drive

Connect Colab AI

### Starting Kit - FAIR UNIVERSE: HIGGSML UNCERTAINTY CHALLENGE

For Overview and Decsptions of the competition, please visit the competition page

#### Setup

COLAB determines whether this notebook is running on Google Colab.

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

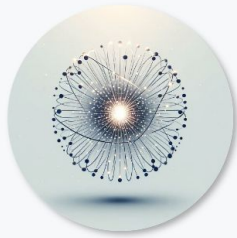
```
[ ] if COLAB:
    # clone github repo
    !git clone https://github.com/FAIR-Universe/HEP-Challenge.git
    !pip install iminuit

    # move to the HEP starting kit folder
    %cd HEP-Challenge/
```

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



## 8. Get Public Data



# FAIR UNIVERSE - HIGGSML UNCERTAINTY CHALLENGE


1

PARTICIPANTS

40

SUBMISSIONS

ORGANIZED BY: FAIR Universe  
CURRENT PHASE ENDS: 31 March 2024 At 05:00 GMT+5  
CURRENT SERVER TIME: 5 March 2024 At 16:11 GMT+5  
Docker image: [nersc/fair\\_universe:1298f0a8](#)



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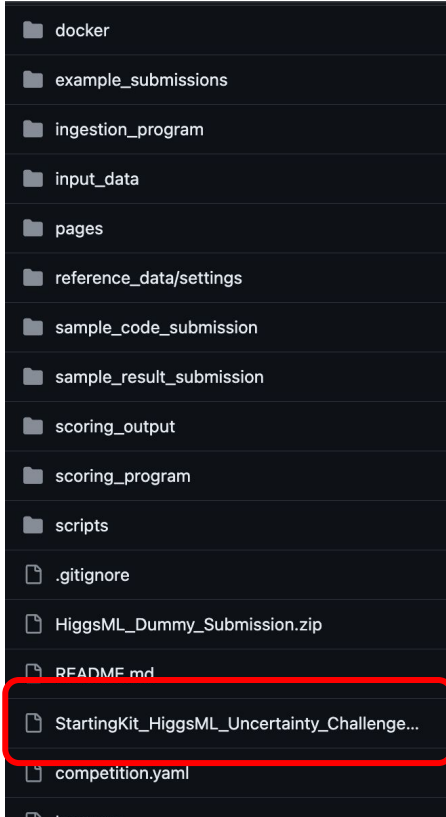
Files

Download	Phase	Task	Type	Size
ACAT Public Data Parquet	1	-	Public Data	1.32 GB




## 9. Access Starting Kit Notebook on Github

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



## 10. Checkout example submissions


[https://github.com/FAIR-Universe/HEP-Challenge/tree/master/example\\_submissions](https://github.com/FAIR-Universe/HEP-Challenge/tree/master/example_submissions)


 NN\_model.zip

 NN\_saved.zip

 README.md

 pytorch\_nll.zip

 xgb\_model.zip

 xgb\_saved.zip