

# Fair Universe

HiggsML Uncertainty Challenge

**Codabench Tutorial**

# 1. Login or Create Account on Codabench

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## FAIR UNIVERSE: HIGGSML UNCERTAINTY CHALLENGE

14 PARTICIPANTS  
34 SUBMISSIONS

ORGANIZED BY: Ihsaan-Ullah  
CURRENT PHASE ENDS: 3 December 2023 At 05:00 GMT+5  
CURRENT SERVER TIME: 21 November 2023 At 16:45 GMT+5  
Docker image: [ihsaanullah/fair\\_universe.new](#)

Oct 2023 Nov 2023 Dec 2023

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Overview

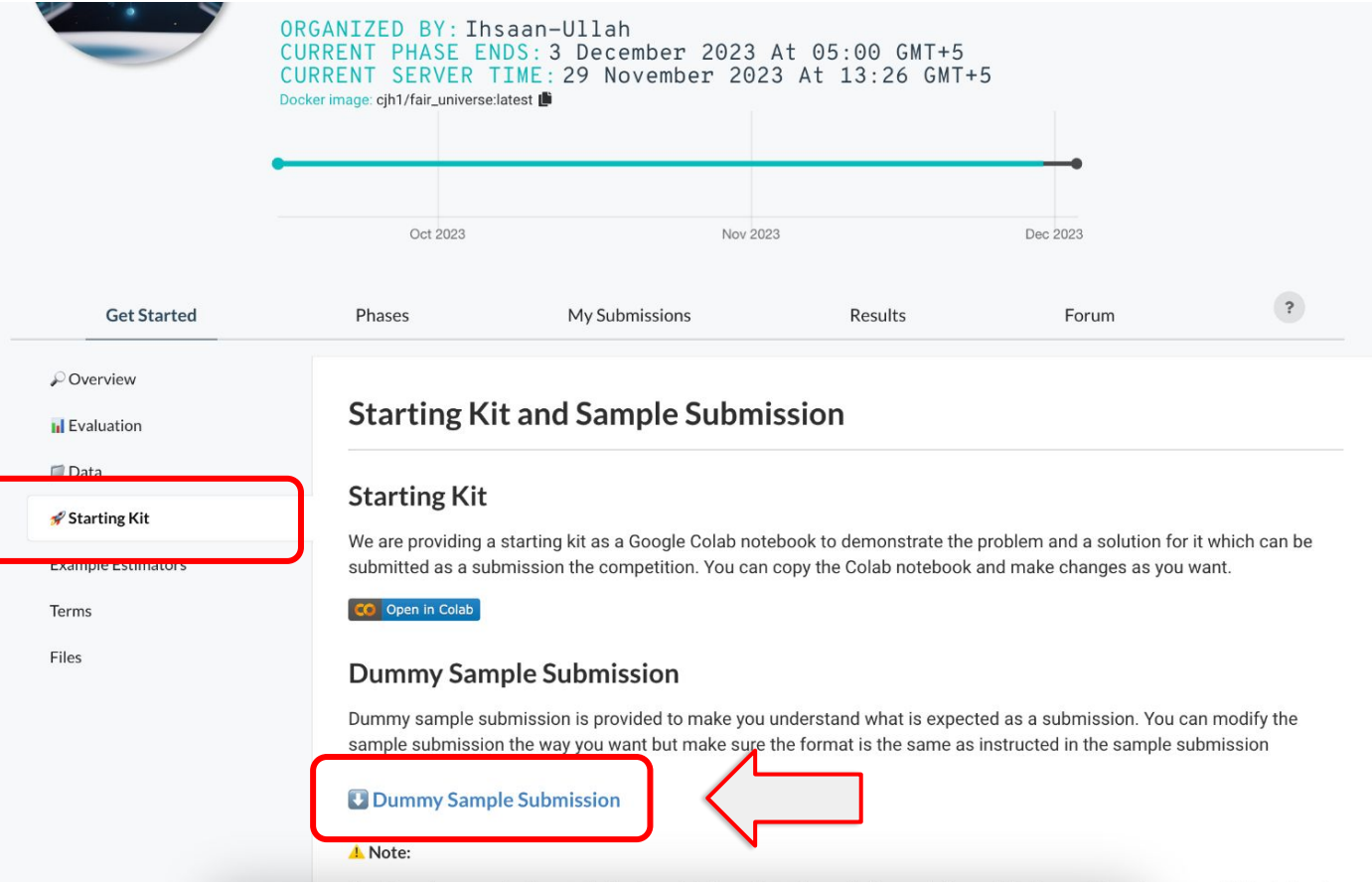
- Evaluation
- Data
- Starting Kit
- Terms
- Files

### 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

## 2. Download Dummy Submission



ORGANIZED BY: Ihsaan-Ullah  
CURRENT PHASE ENDS: 3 December 2023 At 05:00 GMT+5  
CURRENT SERVER TIME: 29 November 2023 At 13:26 GMT+5  
Docker image: cjh1/fair\_universe:latest

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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](#)

**Note:**

### 3. Register in the Competition

Search Competitions

Benchmarks Resources Queue Management ihsanchalearn




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14 PARTICIPANTS

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ORGANIZED BY: Ihsaan-Ullah  
CURRENT PHASE ENDS: 3 December 2023 At 05:00 GMT+5  
CURRENT SERVER TIME: 21 November 2023 At 16:55 GMT+5  
Docker image: ihsaanullah/fair\_universe:new



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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

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Phase 1

Number of submissions used for the day

1 out of 50

Number of total submissions used

1 out of 1000

### Submission upload

#### Metadata or Fact Sheet

Method Name: \*

Dummy Submission



Submit as: ?

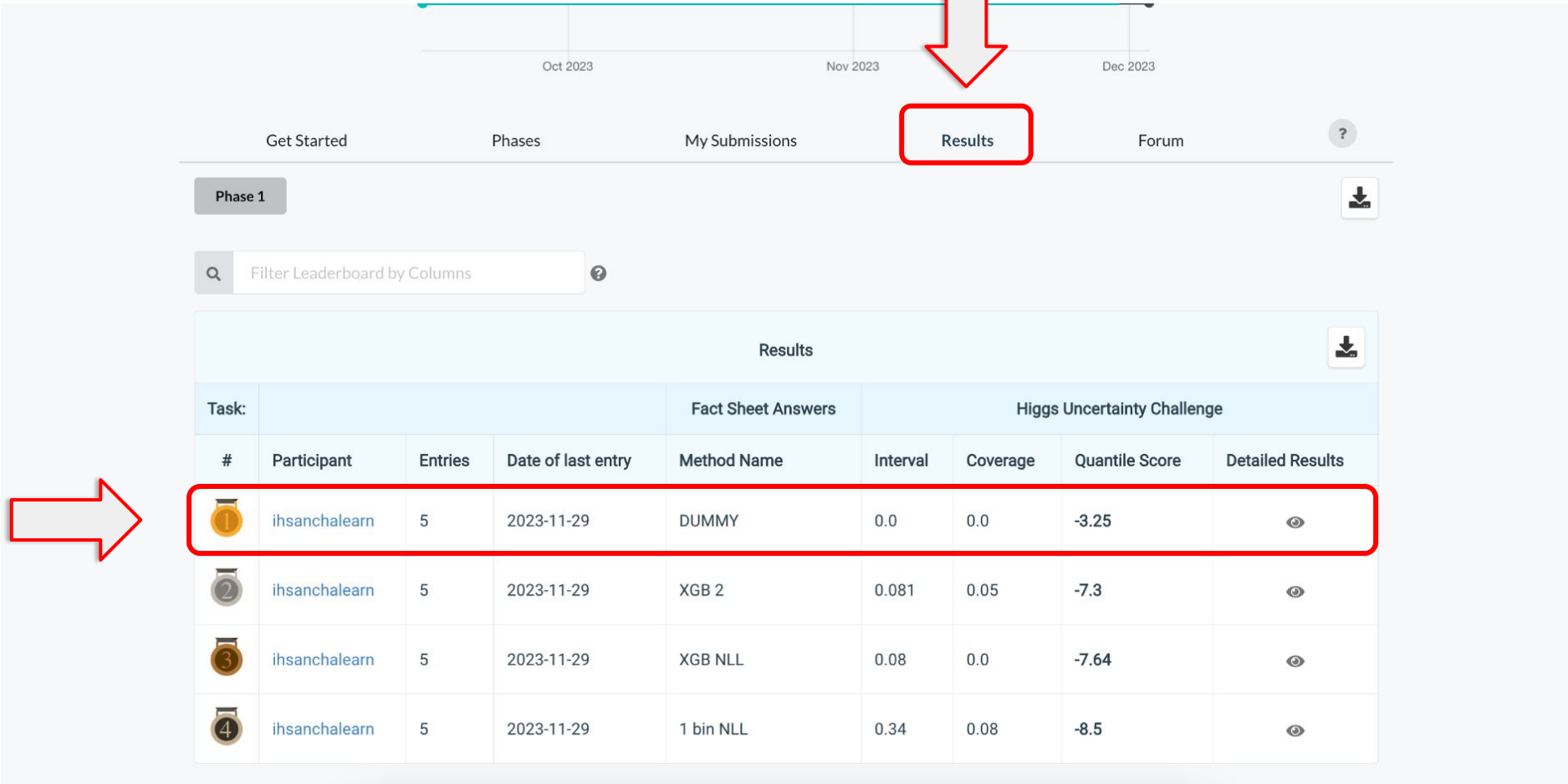
Yourself



HiggsML\_Dummy\_Submission.zip



## 5. Check results in the leaderboard



The screenshot shows a web interface for a competition. At the top, there is a timeline with markers for Oct 2023, Nov 2023, and Dec 2023. Below the timeline are navigation tabs: 'Get Started', 'Phases', 'My Submissions', 'Results', and 'Forum'. The 'Results' tab is highlighted with a red box and a red arrow pointing down to it. Below the tabs is a 'Phase 1' button and a search bar containing 'Filter Leaderboard by Columns'. The main content is a table titled 'Results' with a download icon. The table has columns for 'Task', 'Participant', 'Entries', 'Date of last entry', 'Method Name', 'Interval', 'Coverage', 'Quantile Score', and 'Detailed Results'. The first row is highlighted with a red box and a red arrow pointing to it from the left. The first row contains a gold medal icon, the participant name 'ihsanchalearn', 5 entries, a date of 2023-11-29, the method name 'DUMMY', an interval of 0.0, a coverage of 0.0, and a quantile score of -3.25. The other rows show silver, bronze, and fourth-place results with decreasing quantile scores.

Task:				Fact Sheet Answers	Higgs Uncertainty Challenge			
#	Participant	Entries	Date of last entry	Method Name	Interval	Coverage	Quantile Score	Detailed Results
1	ihsanchalearn	5	2023-11-29	DUMMY	0.0	0.0	-3.25	
2	ihsanchalearn	5	2023-11-29	XGB 2	0.081	0.05	-7.3	
3	ihsanchalearn	5	2023-11-29	XGB NLL	0.08	0.0	-7.64	
4	ihsanchalearn	5	2023-11-29	1 bin NLL	0.34	0.08	-8.5	

## 6. Check out the starting kit

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### Starting Kit and Sample Submission

#### 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](#)

#### Sample Submission

This sample submission is a real submission with a baseline method that trains on some data and produce results.

[Sample Submission](#)

**Note:**

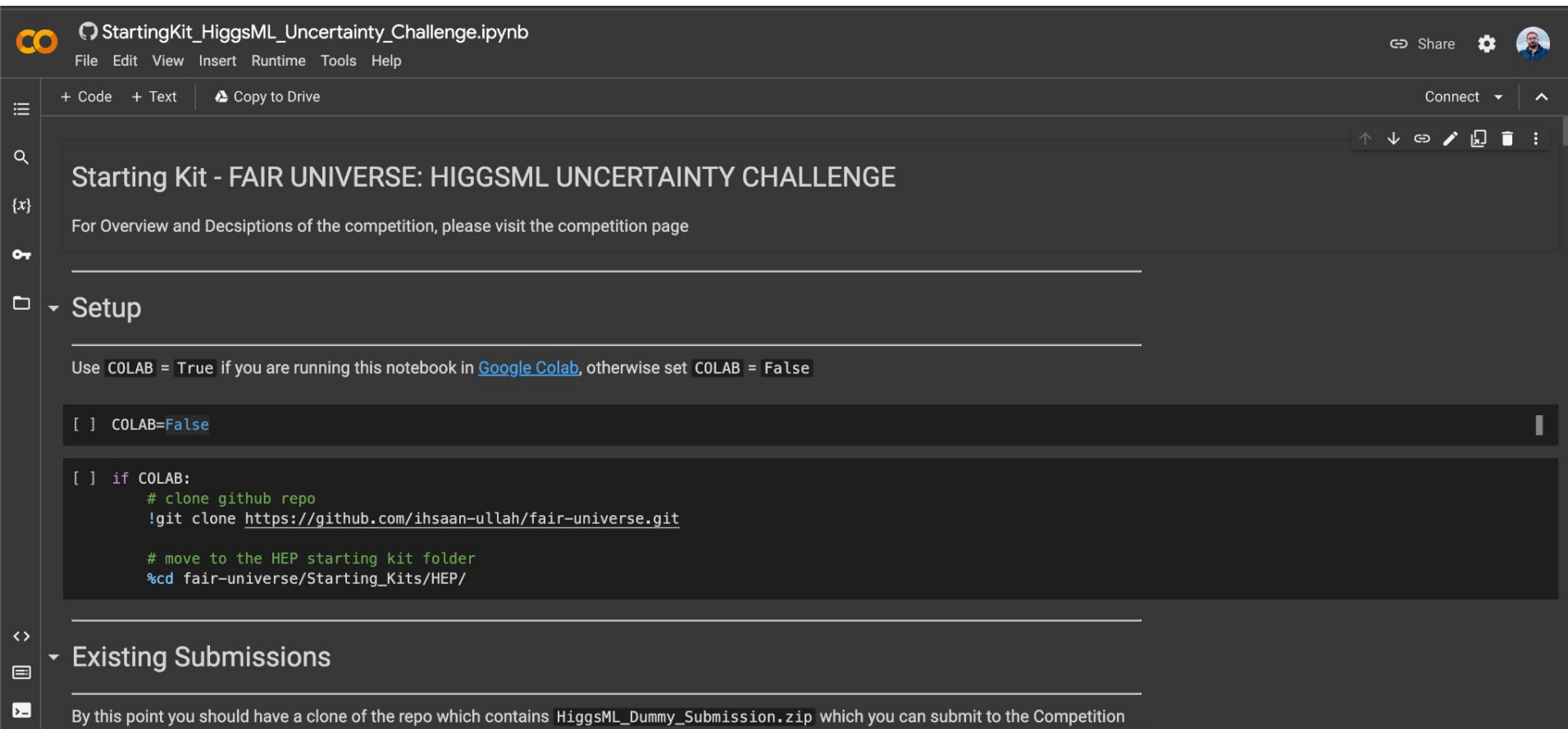
Participants can submit a pre-trained model zipped together with the `model.py`. It is the participants responsibility to load the pre-trained model in the `Model` class. In this case participants may want to ignore the `train_set` provided as input of the `Model` class

#### 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 in the competition. You can copy the Colab notebook and make changes as you want.

[Open in Colab](#)

## 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 the title bar is a menu with 'File', 'Edit', 'View', 'Insert', 'Runtime', 'Tools', and 'Help'. On the right side of the title bar, there are icons for 'Share', a settings gear, and a user profile picture. Below the title bar, there are buttons for '+ Code', '+ Text', and 'Copy to Drive'. On the far right, there is a 'Connect' dropdown menu and an upward arrow icon. The main content area of the notebook is dark-themed and contains the following text:

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

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

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#### Setup

Use `COLAB = True` if you are running this notebook in [Google Colab](#), otherwise set `COLAB = False`

```
[ ] COLAB=False
```

```
[ ] if COLAB:
    # clone github repo
    !git clone https://github.com/ihsaan-ullah/fair-universe.git

    # move to the HEP starting kit folder
    %cd fair-universe/Starting_Kits/HEP/
```

---

#### Existing Submissions

By this point you should have a clone of the repo which contains `HiggsML_Dummy_Submission.zip` which you can submit to the Competition



## 8. Get Public Data



# FAIR UNIVERSE: HIGGSML UNCERTAINTY CHALLENGE

1 PARTICIPANTS

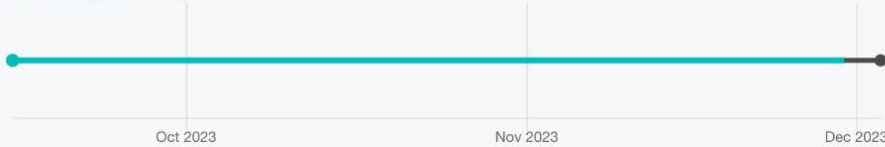
16 SUBMISSIONS

ORGANIZED BY: Ihsaan-Ullah

CURRENT PHASE ENDS: 3 December 2023 At 05:00 GMT+5

CURRENT SERVER TIME: 29 November 2023 At 13:28 GMT+5

Docker image: `cjh1/fair_universe:latest`



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Size

Uncertainty\_challenge\_open\_data

-

Public Data

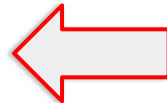
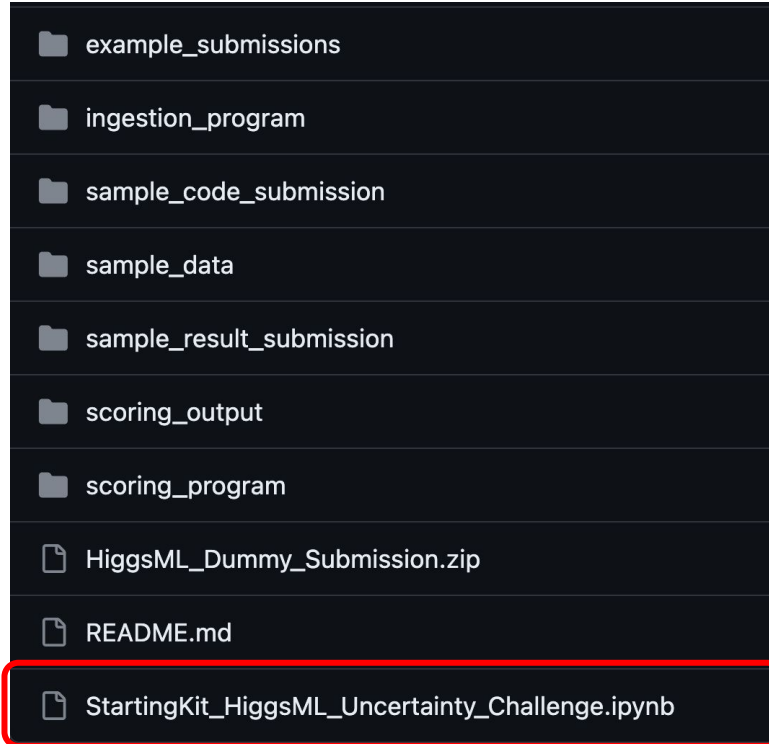


254.02 MB



## 9. Access Starting Kit Notebook on Github

[https://github.com/ihsaan-ullah/fair-universe/tree/master/Starting\\_Kits/HEP](https://github.com/ihsaan-ullah/fair-universe/tree/master/Starting_Kits/HEP)



## 10. Checkout example submissions

[https://github.com/ihsaan-ullah/fair-universe/tree/master/Starting\\_Kits/HEP/example\\_submissions](https://github.com/ihsaan-ullah/fair-universe/tree/master/Starting_Kits/HEP/example_submissions)

 1BinNLL.zip

 Pytorch.zip

 README.md

 XGB\_1.zip

 XGB\_2.zip

 XGB\_NLL.zip

## 11. Code submission structure

- File name: `mode.py`
- Class name: `Model`
- Required functions
  - `__init__`
    - `train_set`
    - `systematics`
  - `fit`
    - No params
  - `predict`
    - `test_set`