Introduction to Codabench

Mirco Hünnefeld on behalf of A3D3

NSF HDR ML Challenge

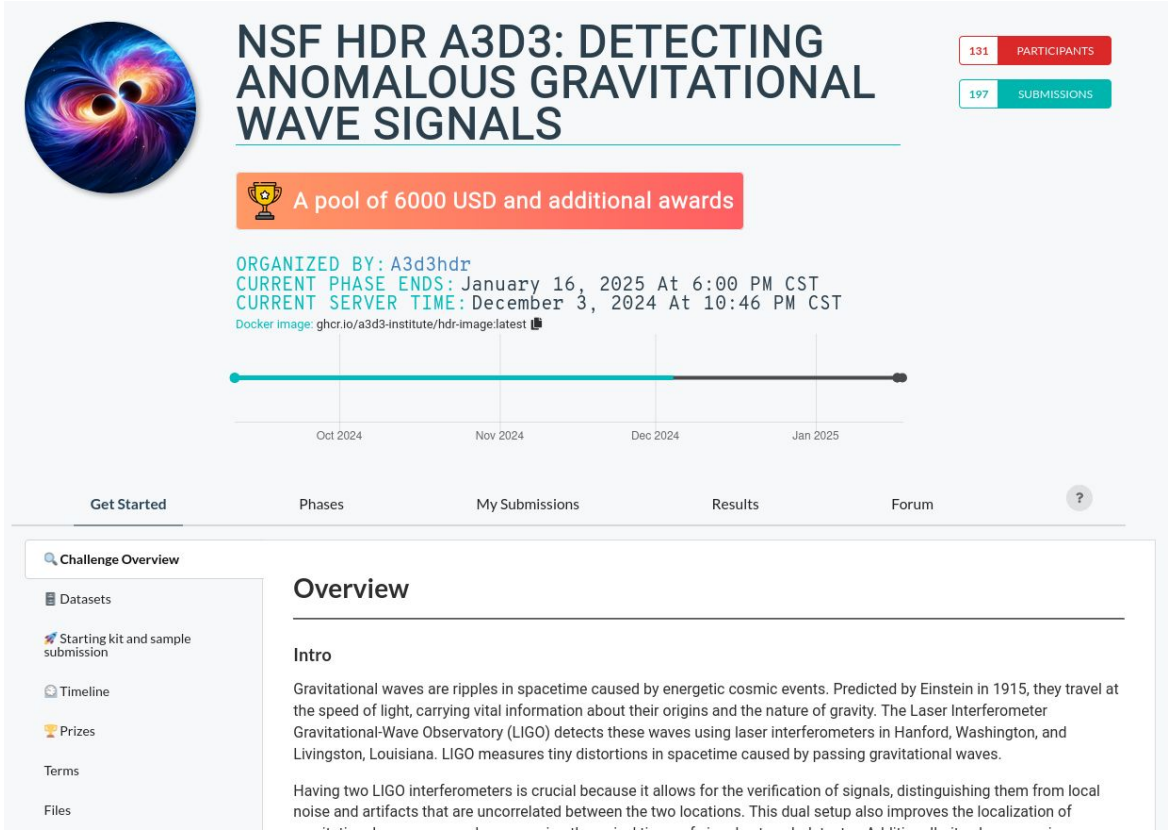
Overview of challenges: https://www.nsfhdr.org/mlchallenge

Challenges hosted on Codabench

What is Codabench?

- Open source platform to organize AI benchmarks
- Hosts competitions on these benchmark datasets

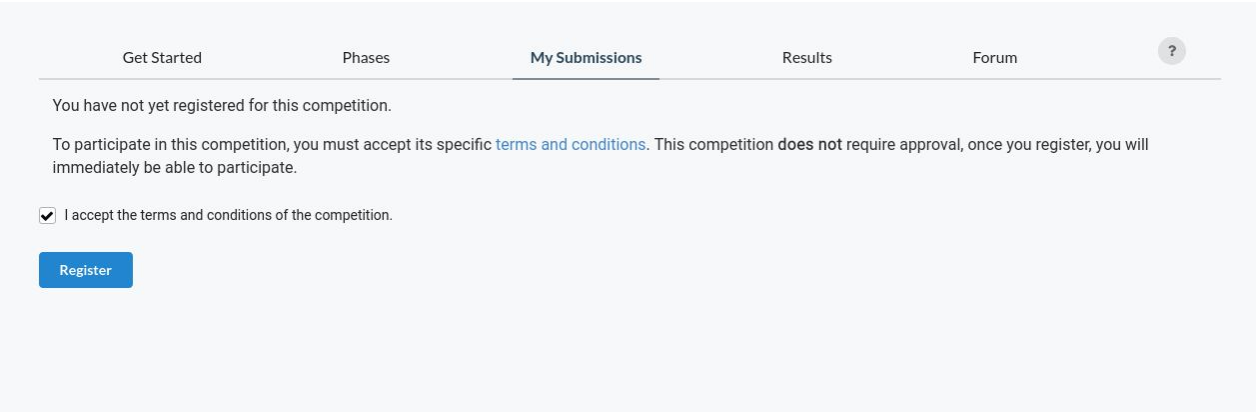
NSF HDR ML Challenges are hosted on Codabench as 3 independent challenges



Outline for today

- Register for ML Challenge
- Download data
- Create and submit dummy solution
- Hands-on work time

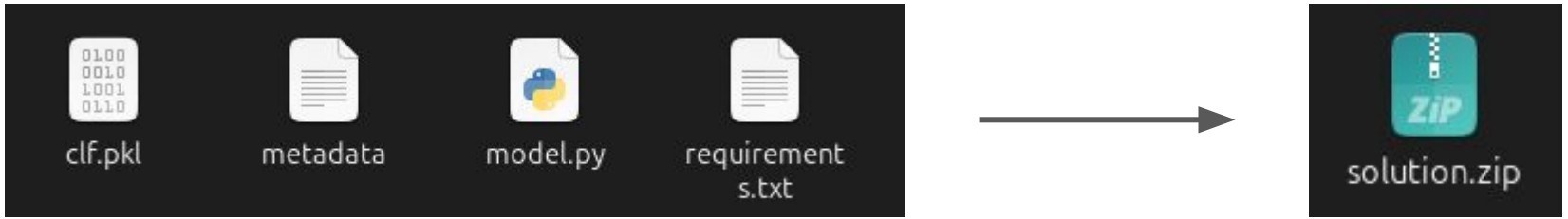
```python
class Model:
    def __init__(self):
        """Iniitlize the model"""
        pass

    def load(self):
        """Load the model from disk"""
        pass

    def predict(self, X):
        """Predict the probability scores for the given input examples"""
        return [0 for x_i in X]
```



https://www.nsfhdr.org/mlchallenge

Submitting a solution

- Each challenge has different input data and expected output
- Format of solution is similar across challenges
- Must submit zip file including at least **model.py**



Example via terminal:

```
zip solution.zip clf.pkl metadata model.py requirements.txt
```

Submitting a solution: **model.py**

- This file is mandatory
- Must define a class **Model**
- Required methods:
  - **__init__(self)**
  - **load(self)**
  - **predict(self, X)**
- Evaluation script runs:

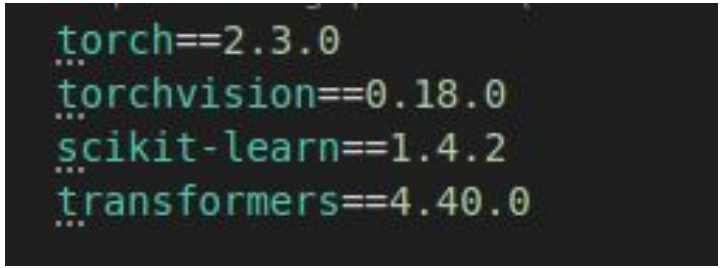
```
from model import Model

model = Model()
model.load()
model.predict(X_test)
```

Dummy model for Gravitational Wave Challenge

```
class Model:
    def __init__(self):
        """Iniitlize the model"""
        pass

    def load(self):
        """Load the model from disk"""
        pass

    def predict(self, X):
        """Predict the probability scores for the given input examples"""
        return [0 for x_i in X]
```

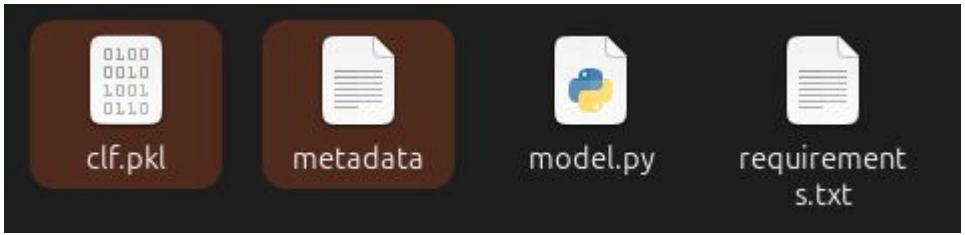
Submitting a solution: **requirements.txt**

- This file is optional
- Defines required python packages
- Packages are installed prior to running model
- Note: packages must be on whitelist
  - Packages can be added with admin approval



Submitting a solution: auxiliary files

- Submitted zip file may include additional files
- Files could include:
  - Configuration of model architecture (e.g. Keras json file)
  - Weights of model
- Example: your **Model.load()** method could use these files to instantiate and load the neural network weights
- Note: you will have to use absolute file paths, e.g.: **os.path.join(__file__, “clf.pkl”)**



Links

Indico page: https://indico.cern.ch/event/1485495/

Overview of challenges: https://www.nsfhdr.org/mlchallenge

Gravitational wave challenge:

- Codabench: https://www.codabench.org/competitions/2626/
- Github: https://github.com/a3d3-institute/HDRchallenge/

Hybrid Butterflies:

- Codabench: https://www.codabench.org/competitions/3764/
- Github: https://github.com/Imageomics/HDR-anomaly-challenge-sample

Tidal Fluctuations:

- Codabench: https://www.codabench.org/competitions/3223

Link to indico and these slides