

TODO: Add description per project

GW anomaly detection

Description:

Code:

Github: [katyagovorkova/challenge_datasets](https://github.com/katyagovorkova/challenge_datasets): Put together scripts used to make datasets for LIGO AD A3D3 Challenge - https://github.com/katyagovorkova/challenge_datasets

Codelab: [LIGO_transformer-based_classifier.ipynb](#) - Colaboratory -

 [LIGO_transformer-based_classifier.ipynb](#)

Dataset: MIT student / also new student

Previous documentations: arxiv.org/pdf/2309.11537.pdf - <https://arxiv.org/pdf/2309.11537.pdf>

Assignee:

SPVCNN clustering

Description:

Code: <https://github.com/mit-han-lab/spvnas-dev>

Dataset: MIT student / also new student

Previous documentations:

Assignee:

SPVCNN vertexing

Description:

Code: <https://github.com/mit-han-lab/spvnas-dev>

Dataset: [HEP_Repo/SPVCNN at master · hrzhao76/HEP_Repo](#) - https://github.com/hrzhao76/HEP_Repo/tree/master/SPVCNN

Previous documentations:

Assignee:

GNN/Transformer for LRT (Large Radius Tracking)

Description:

Code: also have code

Dataset:
Previous documentations:
Assignee: NTU group

Higgs Missing Mass regression

Description:
Code:
Dataset:
Previous documentations:
Assignee:

Sensitivity study for $H \rightarrow aa \rightarrow 4b$

Description:
Code: <https://github.com/mit-han-lab/spvnas-dev>
Dataset: MIT student / also new student
Previous documentations: Arix : SPARNET paper from NTU
Assignee:

CPEC (Circular Electron Positron Collider) color singlet identification (CSI)

Description:
ZH pair production at threshold, back to back production, no boosted Higgs,
Code:
Dataset:
Previous documentations:
Assignee:

CEPC (Circular Electron Positron Collider) pi zero reconstruction

Description:
Code:

Dataset:
Previous documentations:
Assignee:

Unbinned MoDe (Moment Decomposition)

Description: This is a decorrelation method (<https://arxiv.org/abs/2010.09745>) that scales well and has few tunable parameters. It is also the only method that I know of that can go beyond strict independence. However, the existing method requires estimating the conditional CDF in bins of mass. It would be awesome to remove that restriction!

Code:
Dataset:
Previous documentations:
Assignee:

Regularization for likelihood ratio estimation

Description: I've been thinking for a while about applying a method like <https://arxiv.org/abs/2112.00038> to the problem of likelihood ratio estimation for unfolding or anomaly detection. I think this could be quite impactful if it allows us to impose physics priors in order to enhance sensitivity for the same size data.

Code:
Dataset:
Previous documentations:
Assignee: