

CEPC

Jets, samples and Wednesday working meeting

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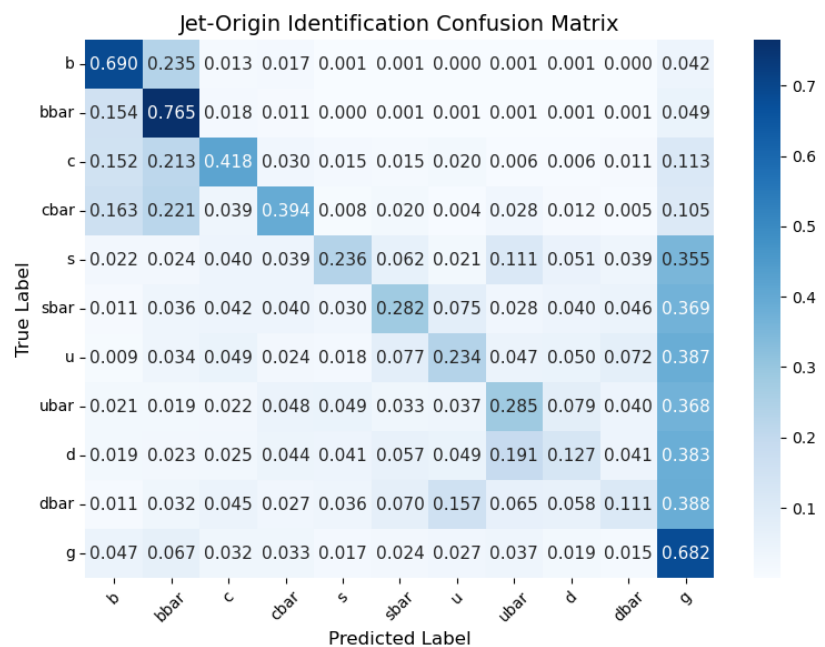
Locate JOI NaN

- ParT use Lorentz vector information in model

- If cancel it: no NaN anymore:

```
def forward(self, points, features, lorentz_vectors, mask):
    return self.mod(features, v=lorentz_vectors, mask=mask)
```

```
def forward(self, points, features, lorentz_vectors, mask):
    return self.mod(features, v=None, mask=mask)
```



JOI performance other than b quark performance reduced sharply. (can not separate from gluon)

Locate NaN:

- Happen when calculate likeness

With acc=0.

```
[2025-04-09 13:06:46,195] ERROR: Input contains NaN.
Stack (most recent call last):
  File "/cefs/higgs/zhangkl/AI/miniconda3/envs/weaver/bin/weaver", line 8, in <module>
    sys.exit(main())
  File "/cefs/higgs/zhangkl/AI/miniconda3/envs/weaver/lib/python3.10/site-packages/weaver/train.py", line 982, in main
    _main(args)
  File "/cefs/higgs/zhangkl/AI/miniconda3/envs/weaver/lib/python3.10/site-packages/weaver/train.py", line 893, in _main
    test_metric, scores, labels, observers = evaluate(
  File "/cefs/higgs/zhangkl/AI/miniconda3/envs/weaver/lib/python3.10/site-packages/weaver/utils/nn/tools.py", line 227, in evaluate_classification
    metric_results = evaluate_metrics(labels[data_config.label_names[0]], scores, eval_metrics=eval_metrics)
  File "/cefs/higgs/zhangkl/AI/miniconda3/envs/weaver/lib/python3.10/site-packages/weaver/utils/nn/metrics.py", line 70, in evaluate_metrics
    logger.error(str(e))
[2025-04-09 13:06:46,202] DEBUG: Traceback (most recent call last):
  File "/cefs/higgs/zhangkl/AI/miniconda3/envs/weaver/lib/python3.10/site-packages/weaver/utils/nn/metrics.py", line 67, in evaluate_metrics
    results[metric] = func(y_true, y_score)
  File "/cefs/higgs/zhangkl/AI/miniconda3/envs/weaver/lib/python3.10/site-packages/sklearn/utils/_param_validation.py", line 216, in wrapper
    return func(*args, **kwargs)
  File "/cefs/higgs/zhangkl/AI/miniconda3/envs/weaver/lib/python3.10/site-packages/sklearn/metrics/_ranking.py", line 620, in roc_auc_score
    y_score = check_array(y_score, ensure_2d=False)
  File "/cefs/higgs/zhangkl/AI/miniconda3/envs/weaver/lib/python3.10/site-packages/sklearn/utils/validation.py", line 1107, in check_array
    _assert_all_finite(
  File "/cefs/higgs/zhangkl/AI/miniconda3/envs/weaver/lib/python3.10/site-packages/sklearn/utils/validation.py", line 120, in _assert_all_finite
    _assert_all_finite_element_wise(
  File "/cefs/higgs/zhangkl/AI/miniconda3/envs/weaver/lib/python3.10/site-packages/sklearn/utils/validation.py", line 169, in _assert_all_finite_element_wise
    raise ValueError(msg_err)
ValueError: Input contains NaN.
```

```
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M14it [01:53, 7.12s/it, Acc=1.00000, AvgAcc=1.00000]*M15it [01:53, 7.36s/it, Acc=1.00000, AvgAcc=1.00000]*M15it [02:01, 7.36s/it, Acc=1.00000, AvgAc
c=1.00000]*M16it [02:01, 7.34s/it, Acc=1.00000, AvgAcc=1.00000]*M16it [02:08, 7.34s/it, Acc=1.00000, AvgAcc=1.00000]*M17it [02:08, 7.37s/it, Acc=1.0
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```

Alternative: PN without Lorentz vector



- Do not rely on LorentzVector
- Performance a little worse than ParT.
- Under training