

Semantic Segmentation of LArTPC tracks

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ICL

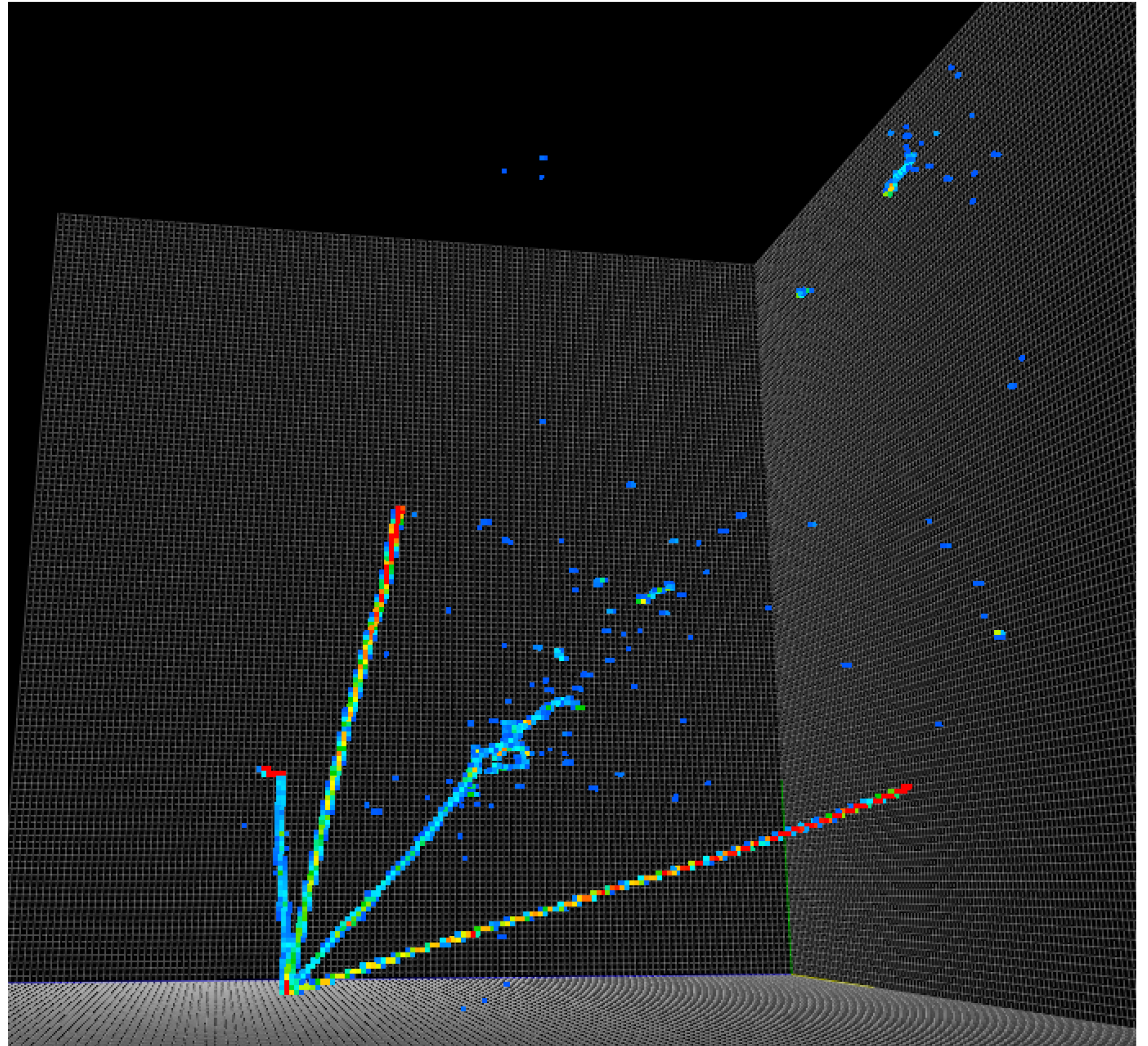


Liquid Argon Detectors

- › DUNE
- › SBND
- › WA105
- › LARA

Joint effort with

- › <http://deeplearnphysics.org>



Competition Setting

Objects:

- › Tracks of particles
- › EM-showers

Data:

- › Volume of $192 \times 192 \times 192$ with energy deposition
- › Training sample have label

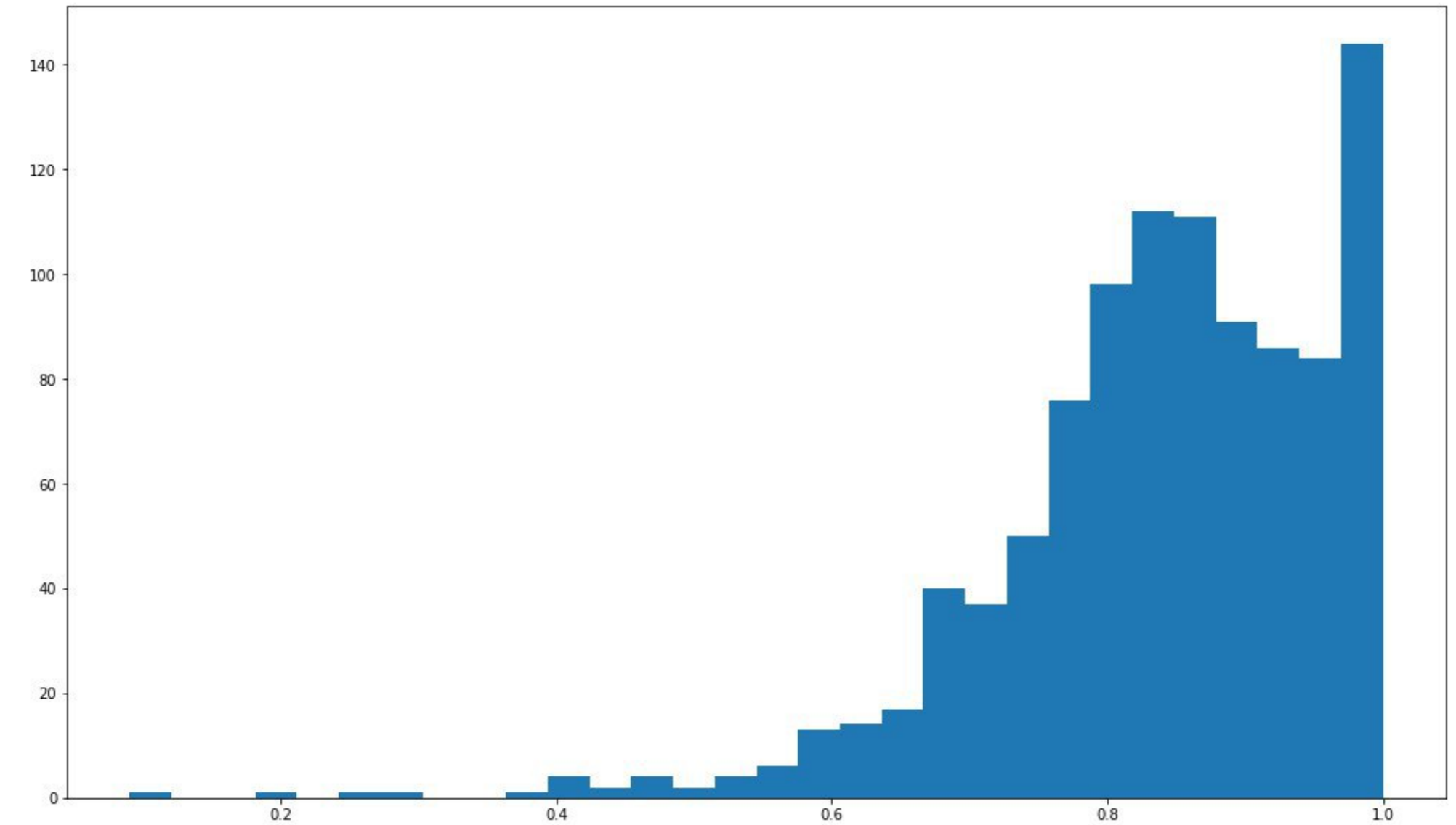
Goal:

- › Track Segmentation, i.e. give correct label to every voxel in test set

Metric

Accuracy per event (volume):

- › A = number of correct labels over number of non-zero labels
- › M – average of A over events in data sample
- › Q_{50} – 50-percentile of A over events in data sample
- › Q_{80} – 80-percentile of A over events in data sample



CodaLab

Same as Kaggle but

- › Allows to define own metric
- › Allows to set challenge in phases
- › Allows several metrics to be computed
- › Even allows to run user submission code
- › Not that expensive

Runs TrackML phase 2



Timing

Phase 1, 3 and 5 – “public leaderboard”

Phase 2, 4, 6 - “private leaderboard”

Phase 5 – goes beyond the school!
Until beginning of October

PHYSTAT-nu

- › <https://indico.cern.ch/event/735431/>
- › 22-25 January 2019, CERN

CodaLab

Public 1

Start: Aug. 6, 2018, midnight

Description: Public leaderboard (1st Cycle)

Private 1

Start: Aug. 9, 2018, 1 a.m.

Description: Private leaderboard (1st Cycle)

Public 2

Start: Aug. 9, 2018, 1 a.m.

Description: Public leaderboard (2nd Cycle)

Private 2

Start: Aug. 12, 2018, 1 a.m.

Description: Private leaderboard (2nd Cycle)

Starter Kit

2D case:

- › http://deeplearnphysics.org/Blog/2018-01-01-BrowsingSegmentationData_v0.1.0.html
- › http://deeplearnphysics.org/Blog/2018-01-05-TrainingSegmentationData_v0.1.0.html

3D case:

- › Convolution networks, graph networks:
<https://github.com/yandexdataschool/mlhep2018-starterkit>

Reminders & Links

Competition

- › <https://competitions.codalab.org/competitions/19818>

Starter kit

- › <https://github.com/yandexdataschool/mlhep2018-starterkit>

Download data to cluster:

- › `!wget -O file <URL> # get from competition -> Participate -> Files`