Result of CNN-Challenge-A: particle image classifier

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Group 01
Aryan Bansal, Haruka Asada, Hiroyuki Ekawa,
Hyuga Abe, Suchetha Cooray, Takuhiro Fujiie

Setup

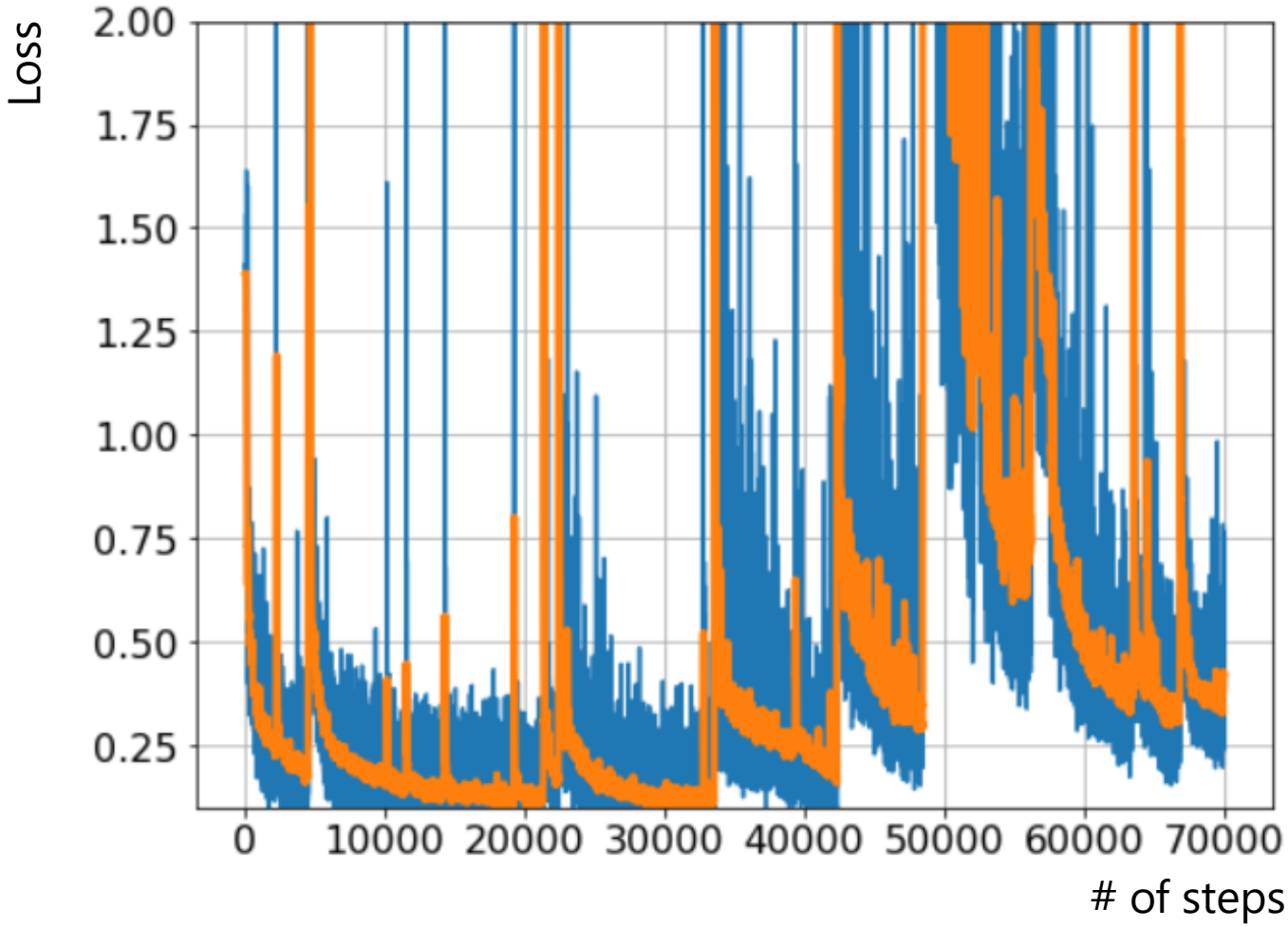
Dataset

- Training data:
  /sdf/group/neutrino/kterao/data/kmi2020/image_classification/train.h5
  - 90% is for training, and 10% is for validation.
  - Validation is performed during the training.
- Test data:
  /sdf/group/neutrino/kterao/data/kmi2020/image_classification/test.h5

We used CNN with batch normalization.

We trains your model for 70,000 steps.

Training result 1: loss

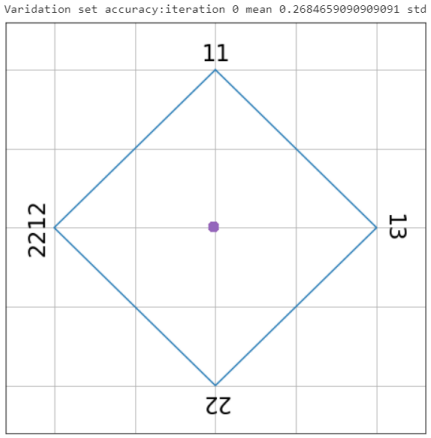


Sometimes something happened and the loss seemed to be “reset”.

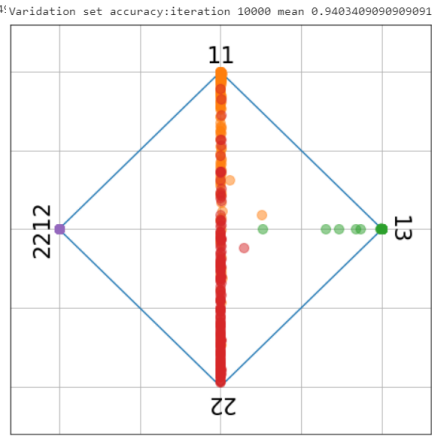
It is expected that finally, we can not obtain our best performance.

Training result 2: validation

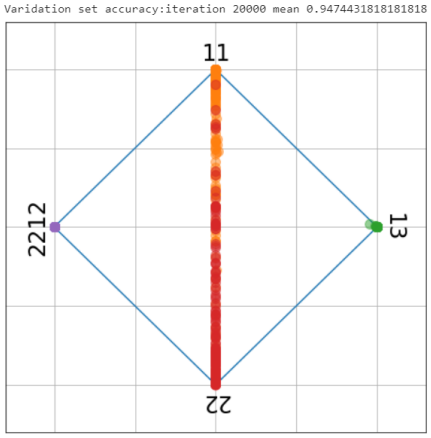
Step=0



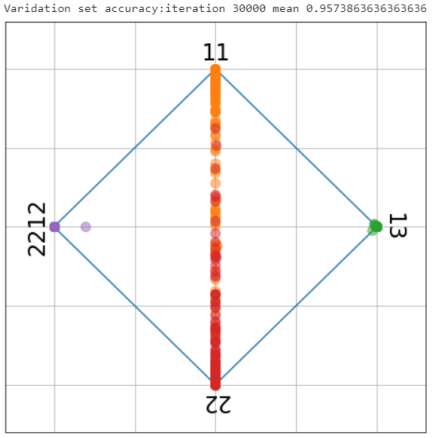
Step=10000



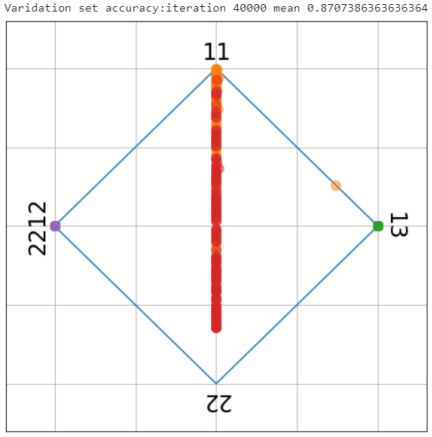
Step=20000



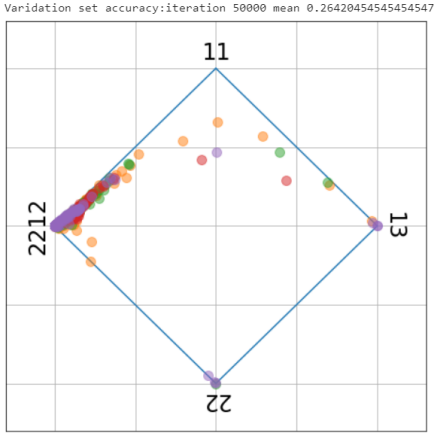
Step=30000



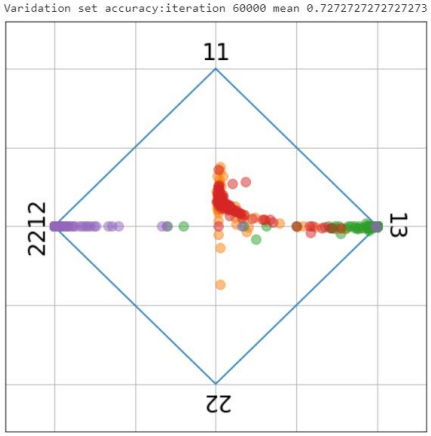
Step=40000



Step=50000

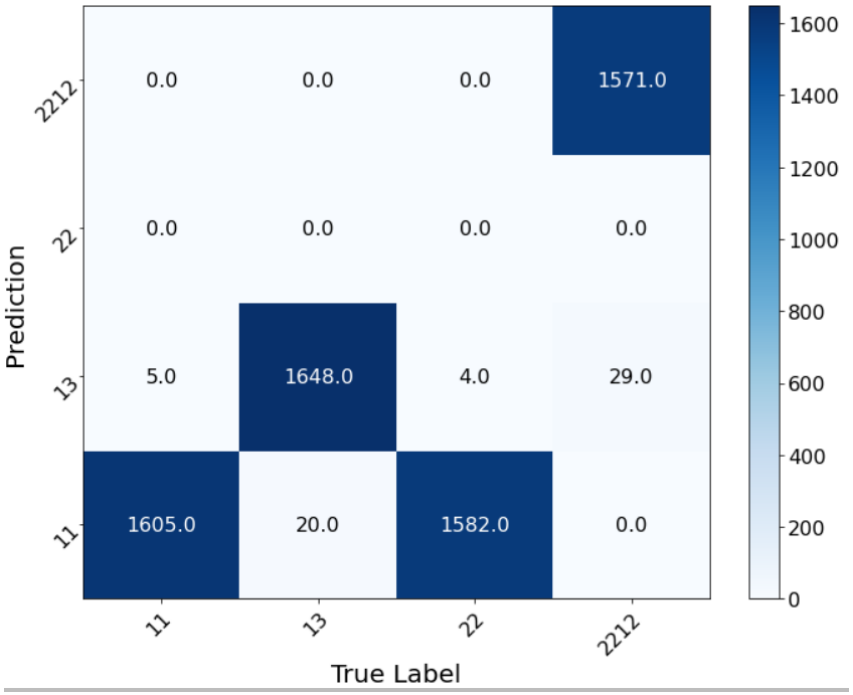


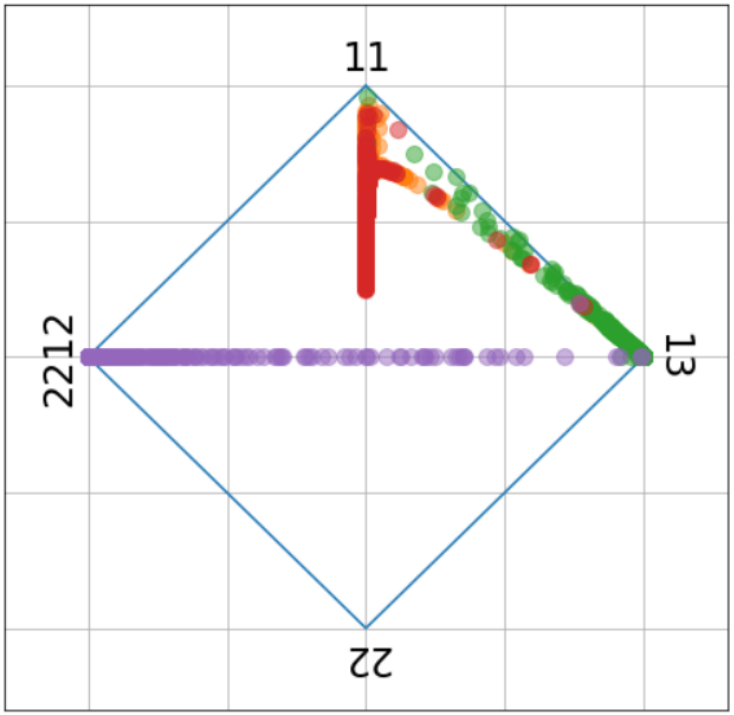
Step=60000



From our validation results we can say the same thing.

Performance check



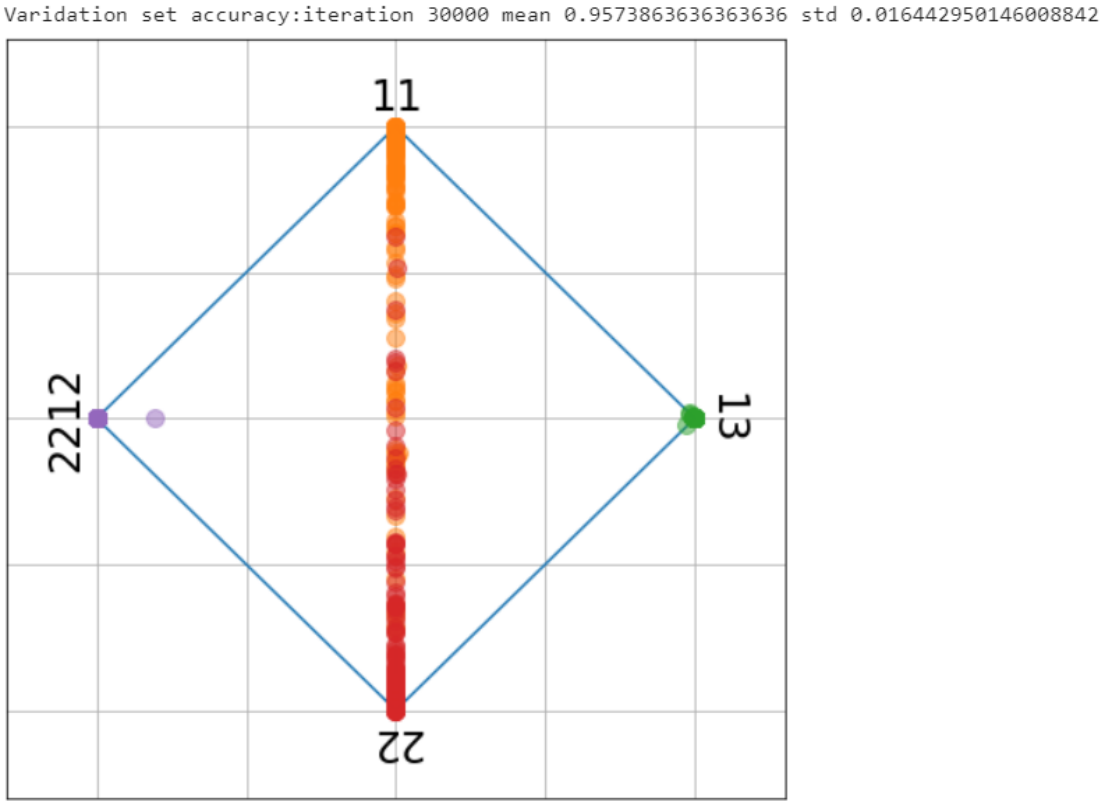


- Test set accuracy mean 0.75 std 0.05

Our model completely misidentifies photons (22) for electrons (11).

Some expects

From our validation results, our best seems to be in step=30000.



If we stop the learning at this step, we may obtain better performance.

Summary

- We worked on the particle image classifier.

- The setup is:
  - CNN with batch normalization
  - # of total steps is 70000

- We obtained the accuracy mean 0.75 std 0.05.
  - Our model misidentifies photons for electrons.

- Our best seems to be in step=30000.