Status Report

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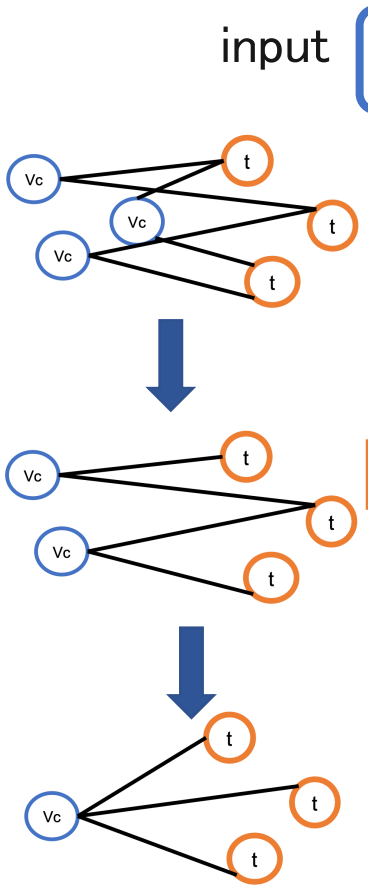
Overview of flavor tagging by GNN



input

Vertex Candidate | Track

Graph Neural Network

Vertex | Track

Contrastive Learning

Vertex | Track

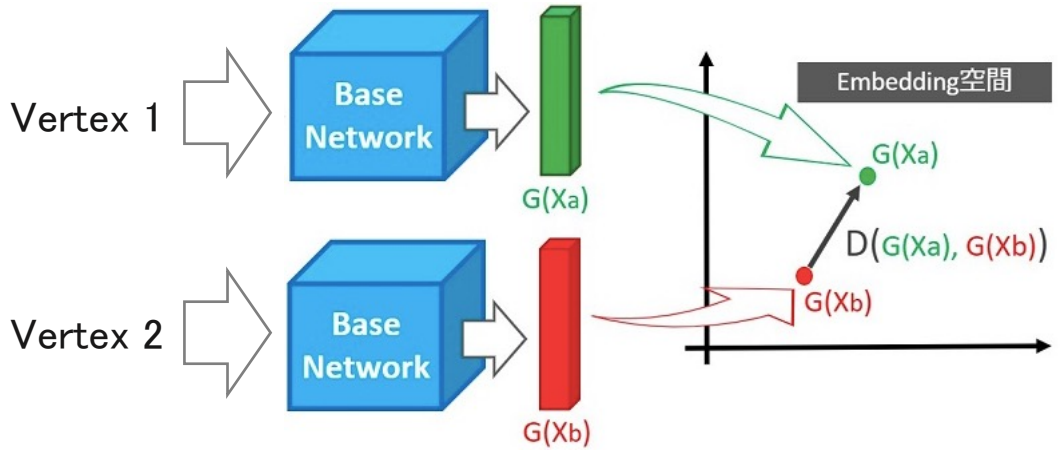
Graph Neural Network

Graph(Flavor) Class

output

: Graph data

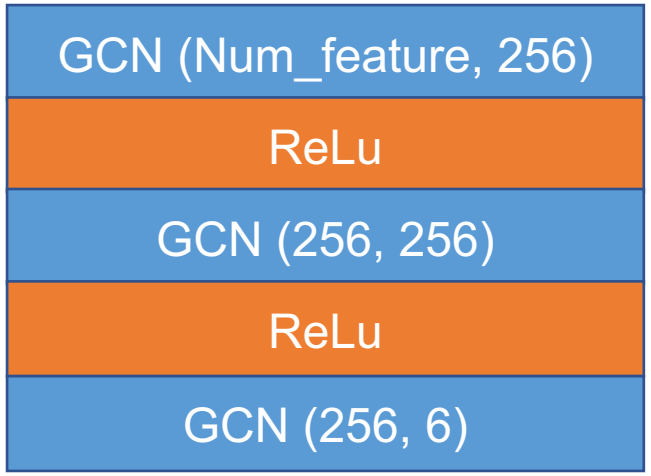
Judge whether a vertex candidate is an existing vertex or not as node classification.



Deep Metric learning brings Vertexes of the same parent particle closer together.

Classify the entire graph into flavor types

Step1 training



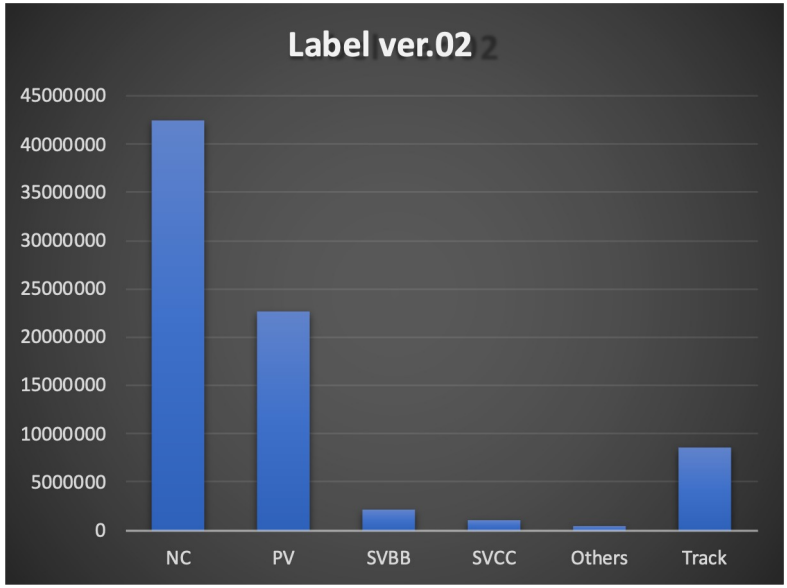
Network structure

- Network: GCN(Graph Convolution Network) 3Layer

  <Semi-Supervised Classification with Graph Convolutional Networks: arXiv:1609.02907>

- In step1, we classify nodes to identify VC that do not exist.

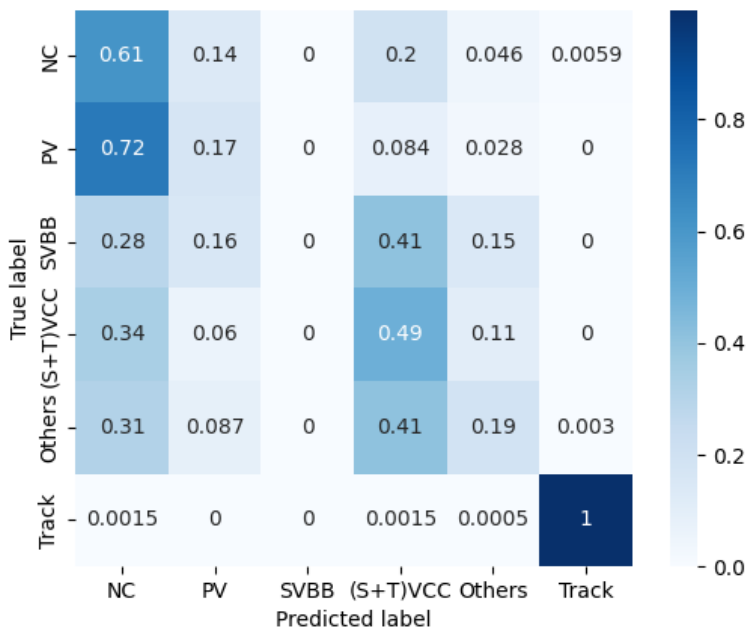
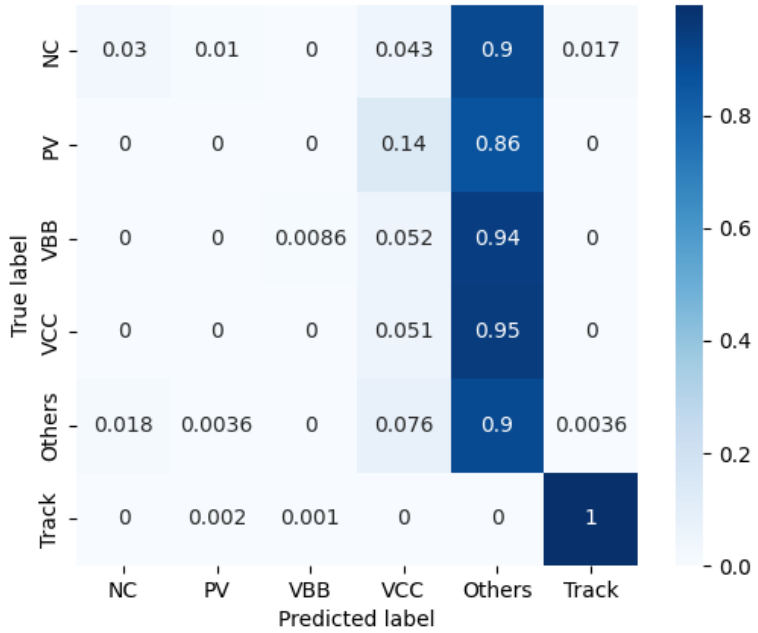
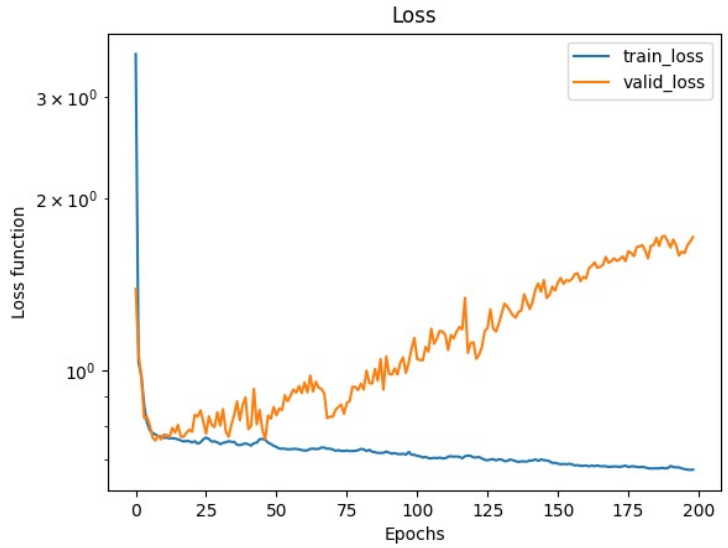
- Answer label
  - 0 : NC ... Non-existent Vertex
  - 1 : PV ... Pair from primary vertex
  - 2 : SVBB ... Pair from secondary vertex of b-flavor
  - 3 : SVCC ... Pair from secondary or tertiary vertex of c-flavor
  - 4 : Others ... Other track pair
  - 5 : Track



Step1 result

Confusion matrix

Before Change Loss



After Change Loss