CENG5030 Lab 03

Sparse Convolution

1 Assignments:

Q1 Read the given "pointcloud.npy" data, which is a 64×4096 matrix. Applying 3×3 winograd convolution that implemented in lab 02 to the data and record the inference time with different out channel numbers. Convolution parameters are given:

- batch: 1
- height_feature: 64
- width_feature: 4096
- in_channels: 1
- out_channels: 64/128/256/512
- kernel_size: 3
- stride: 1
- padding: 0

Analyze the relationship between inference time and output channel.

Q2 Read the given "pointcloud.npy" data, which is a 64×4096 matrix. Implement a C++ version of sparse convolution and record the inference time with different out channel numbers. Convolution parameters are given:

- batch: 1
- height_feature: 64
- width_feature: 4096
- in_channels: 1
- out_channels: 64/128/256/512
- kernel_size: 3
- stride: 1
- padding: 0

Analyze the relationship between inference time and output channel. Compared the sparse convolution results with winograd convolution.

Useful Materials:

- Sparse Convolution