Deep Learning im ray Photoelectron

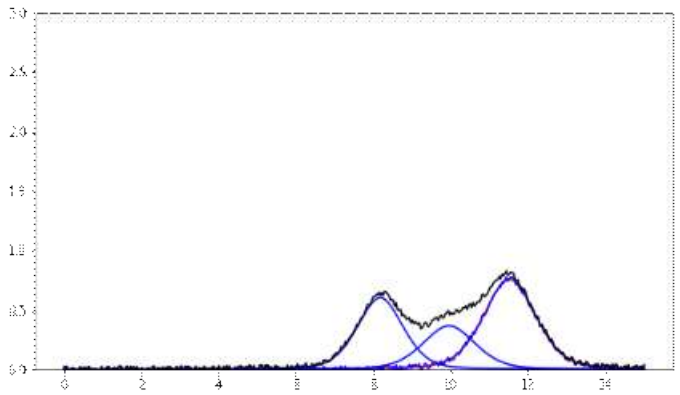
Ab-initio Electr

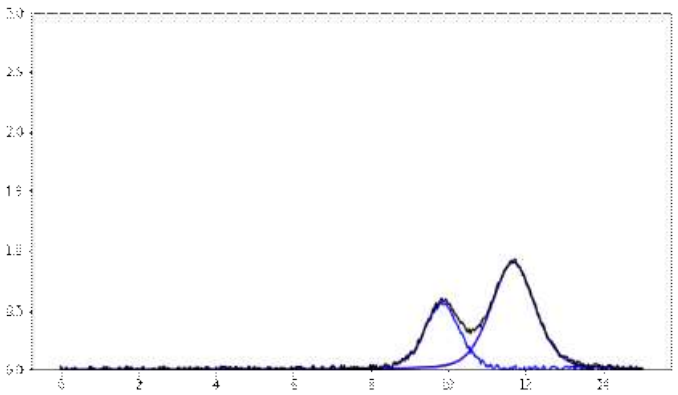
dvisor : Heung-Sik. Kim

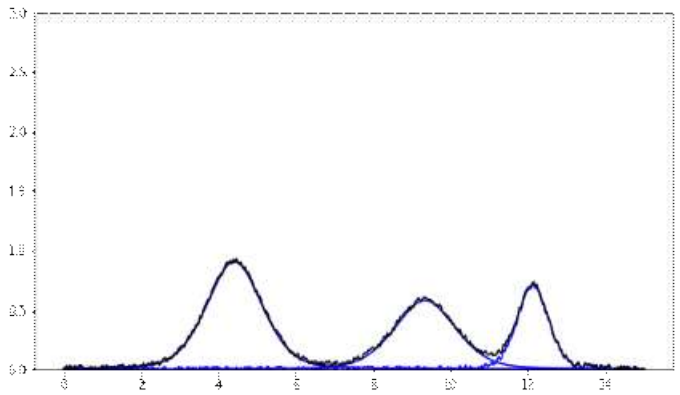
tory : Seong-Heum. Park

content

1. Train Data (0.9 million)



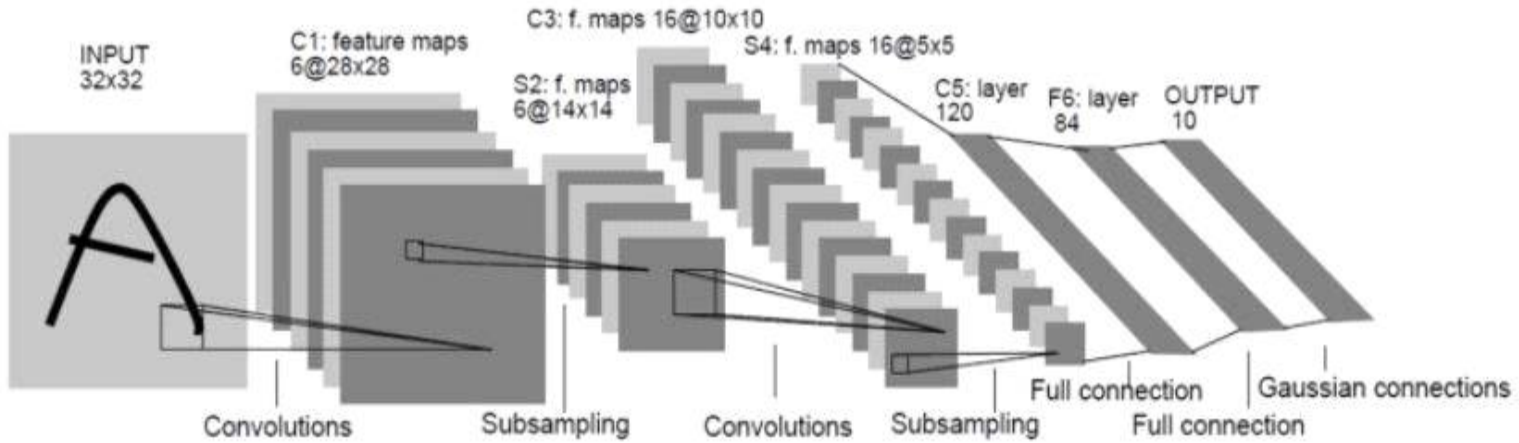


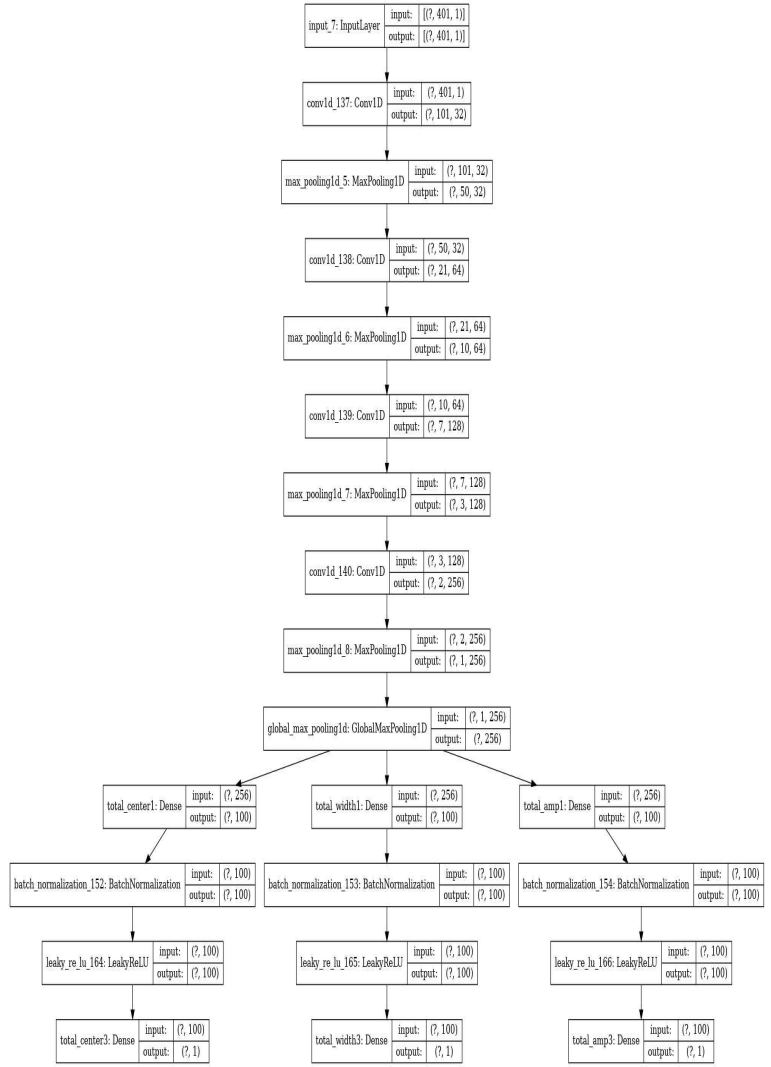


i) data: peak1~3까지의 랜덤된 조합으로 이루어진 그래프

ii) label: 그래프 속의 가장 area가 큰 peak의 center, width, amp

2-1. Lenet version



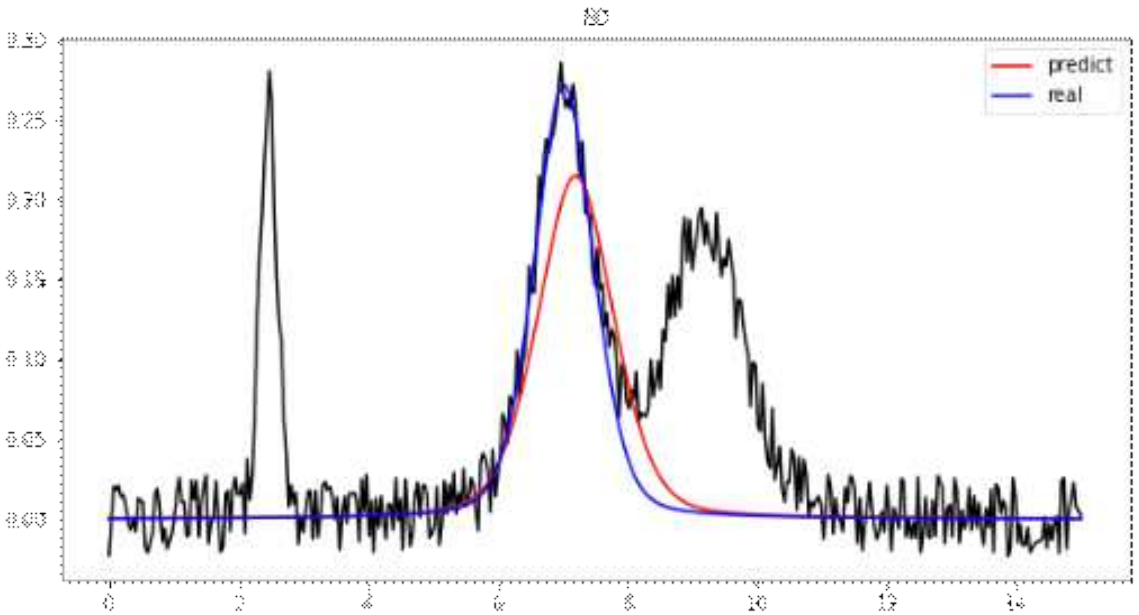


i) 4 convolution layers

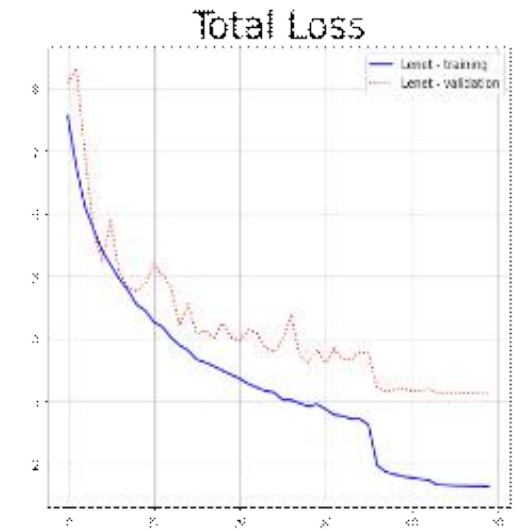
iI) 32x1-64x1-128x1-256x1 feature map

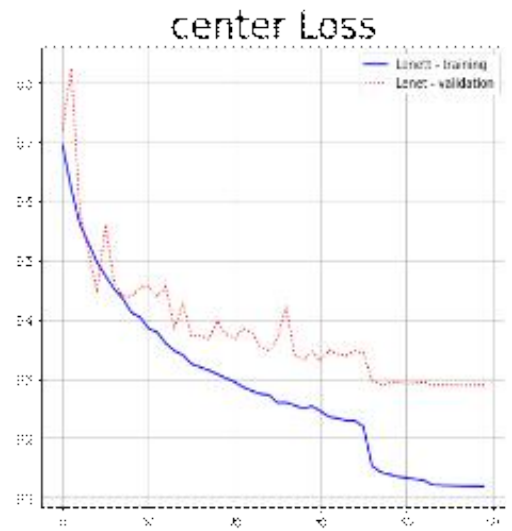
iii) 201,067 parameter

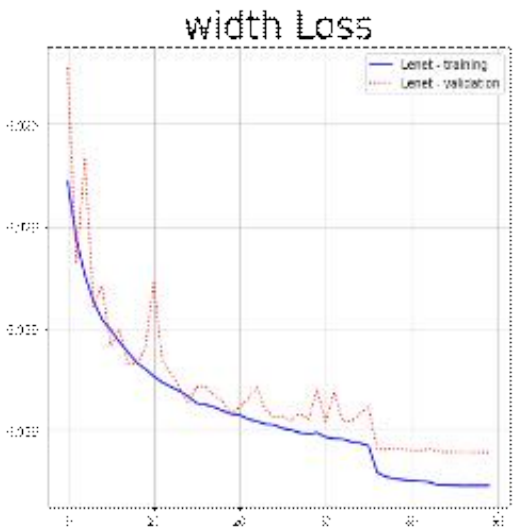
2-1. Lenet version-result

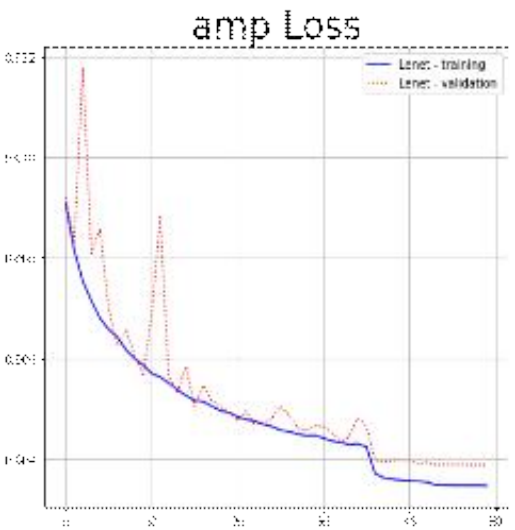


center(mae)	width(mae)	amplitude(mae)
0.1671945	0.0503014	0.0339030

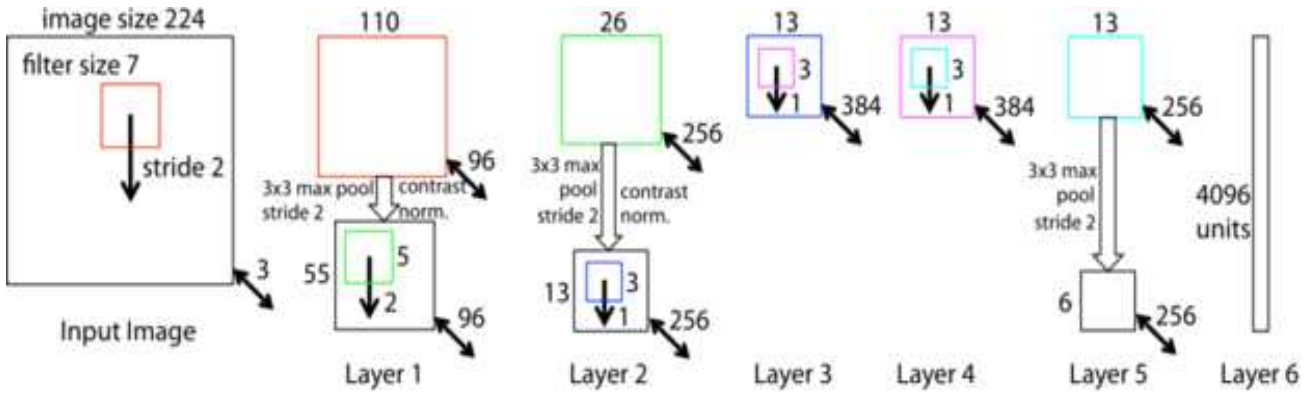


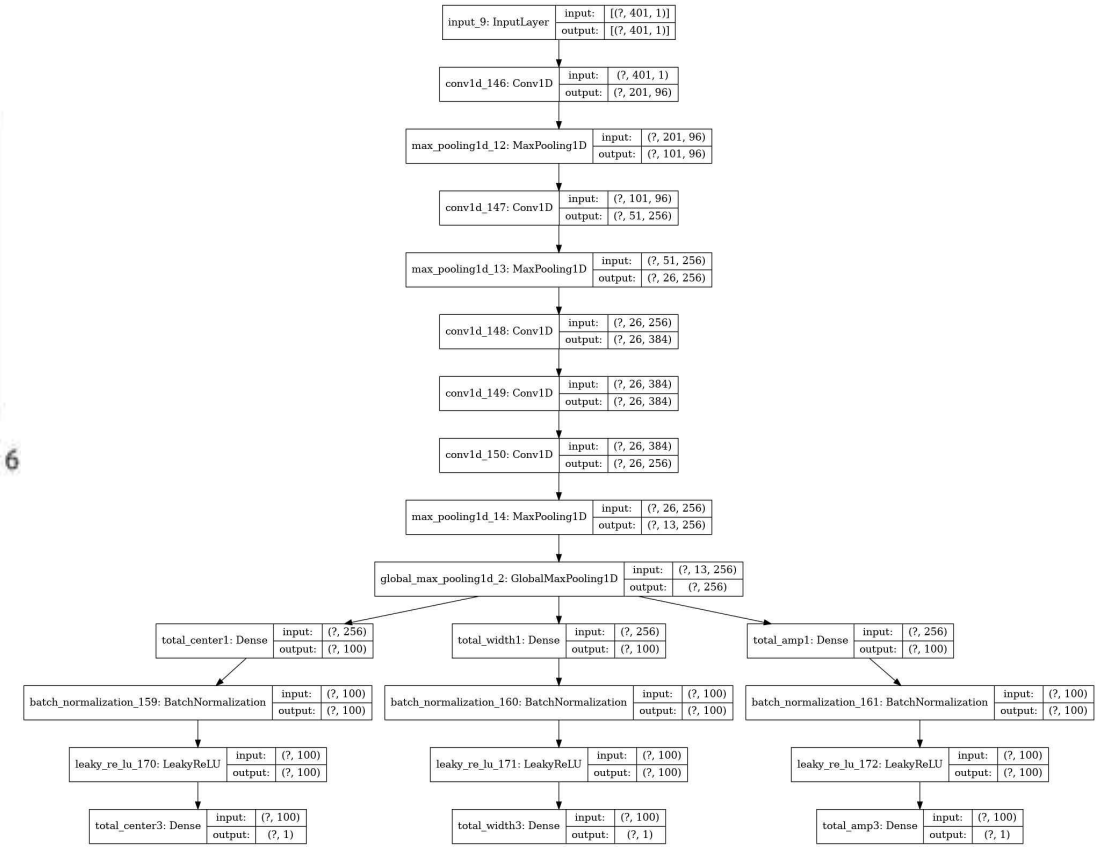






2-2. Alex+ZFnet version



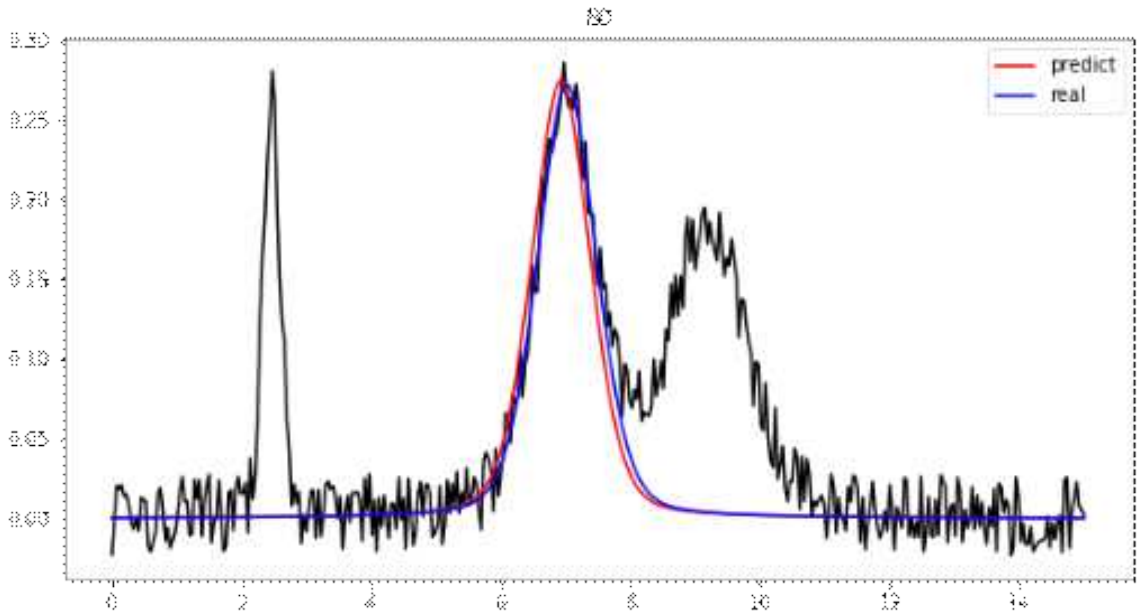


i) 5 convolution layers

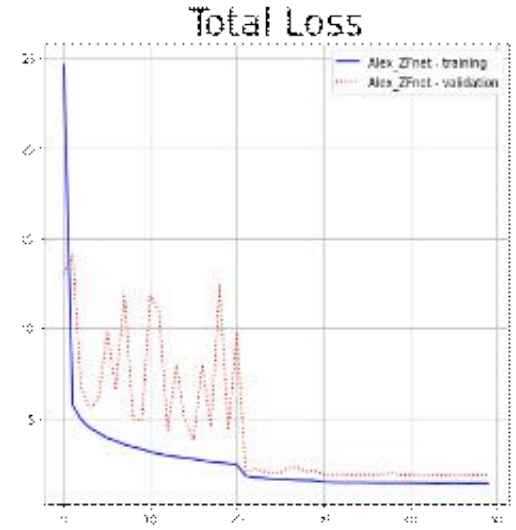
iI) 96x1-256x1-384x2-256x1 feature map

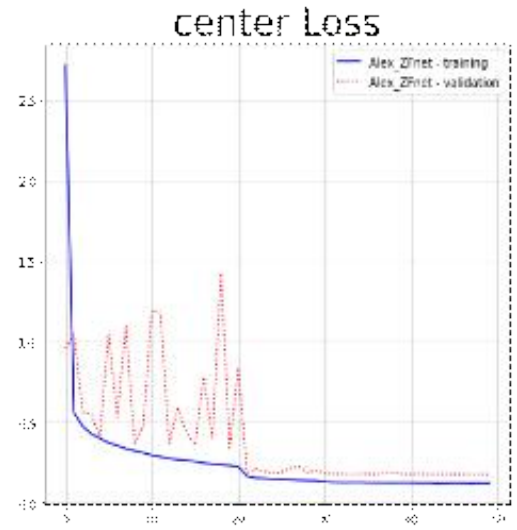
iii) 1,581,035 parameter

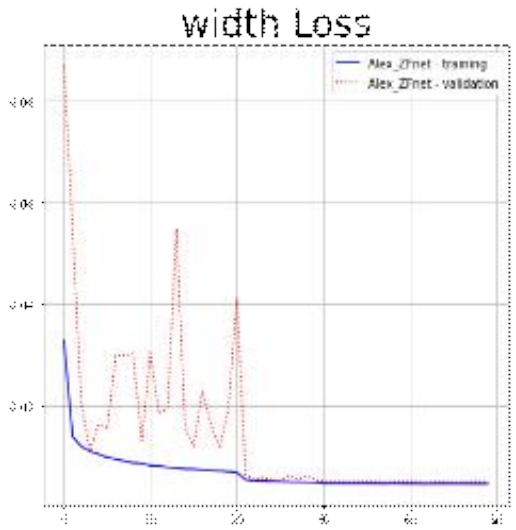
2-2. Alex+ZFnet version-result

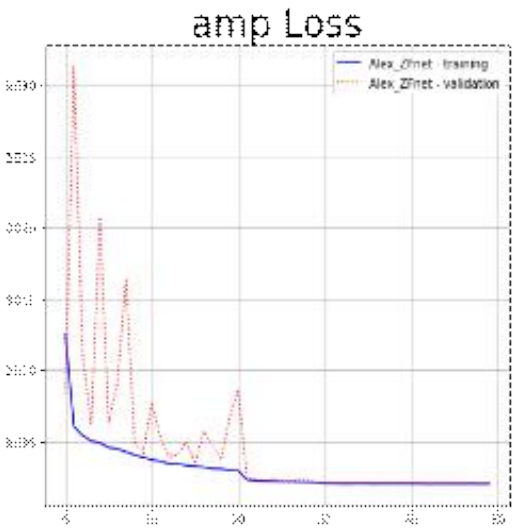


center(mae)	width(mae)	amplitude(mae)
0.1401316	0.0307828	0.0203787

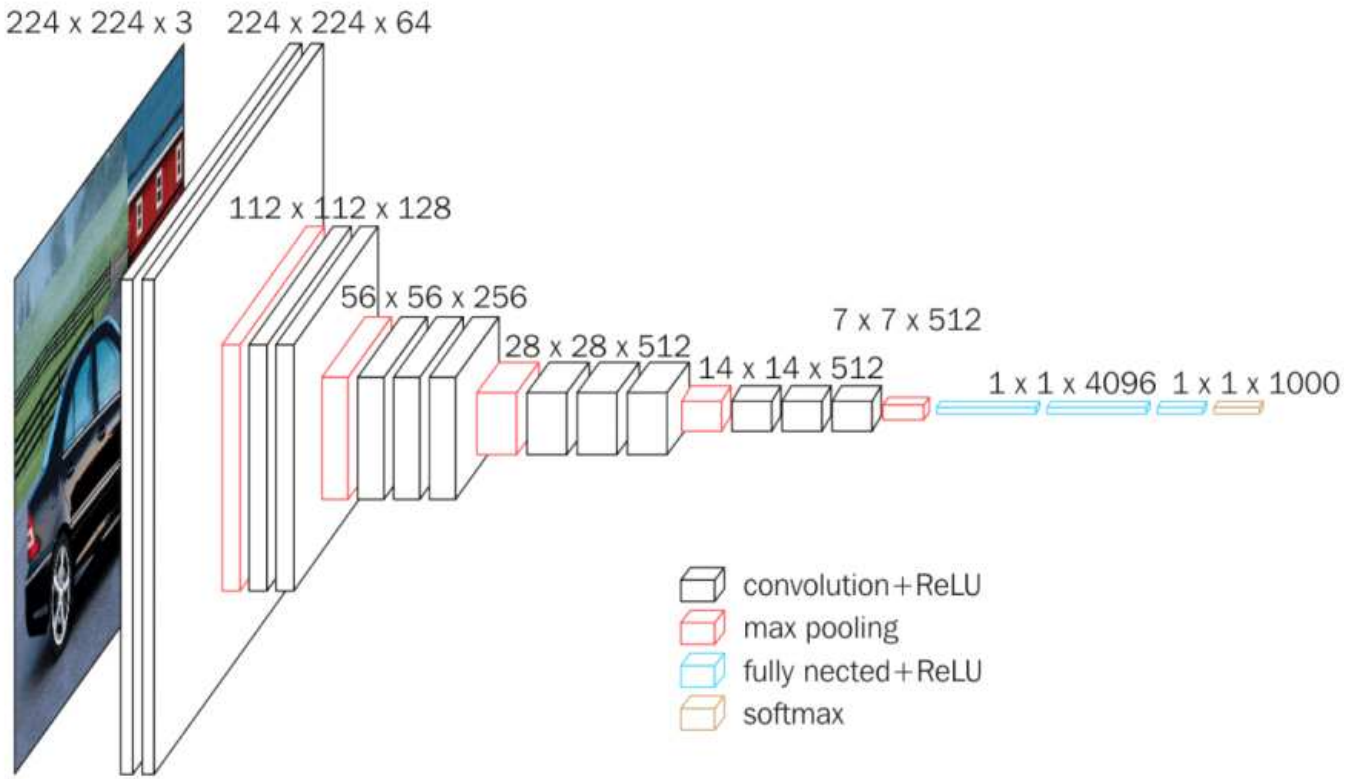








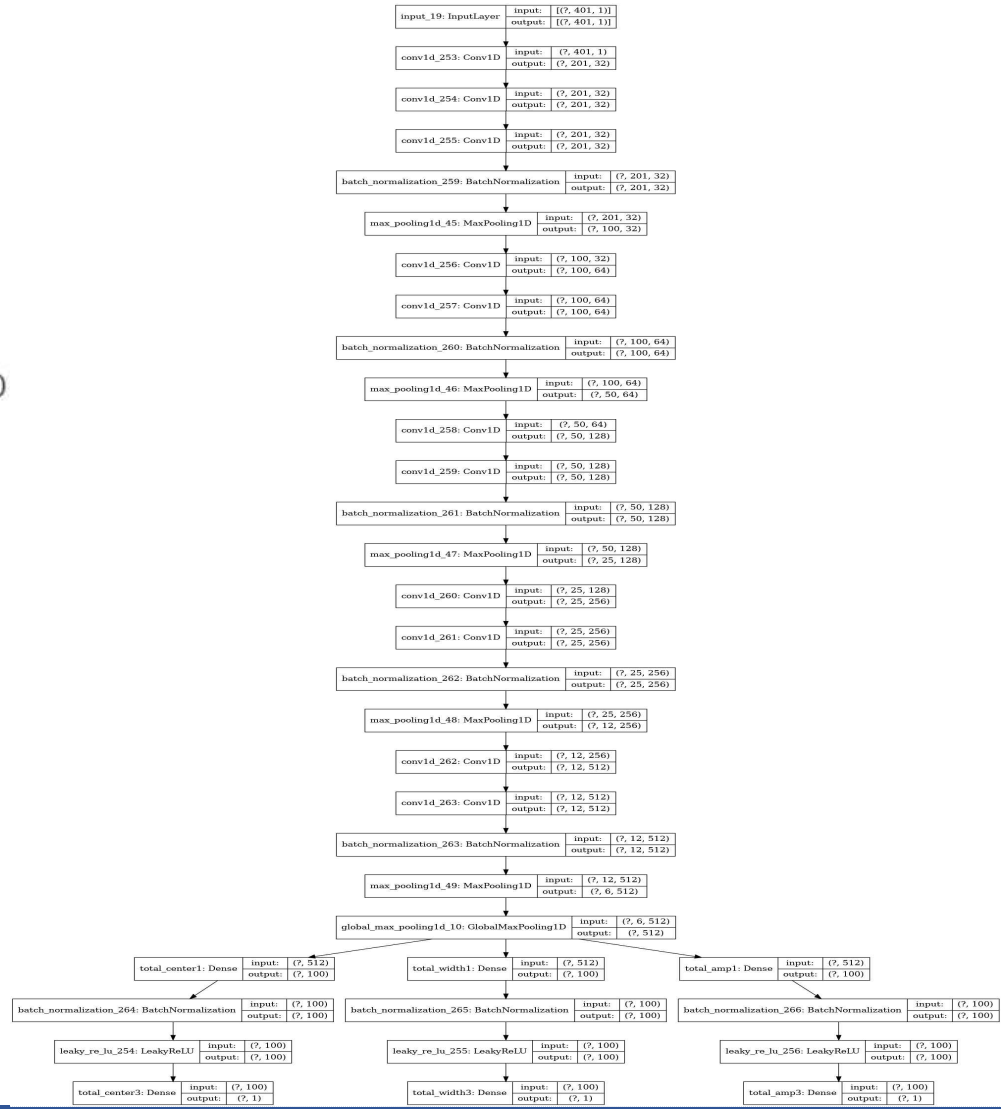
2-3. VGG version



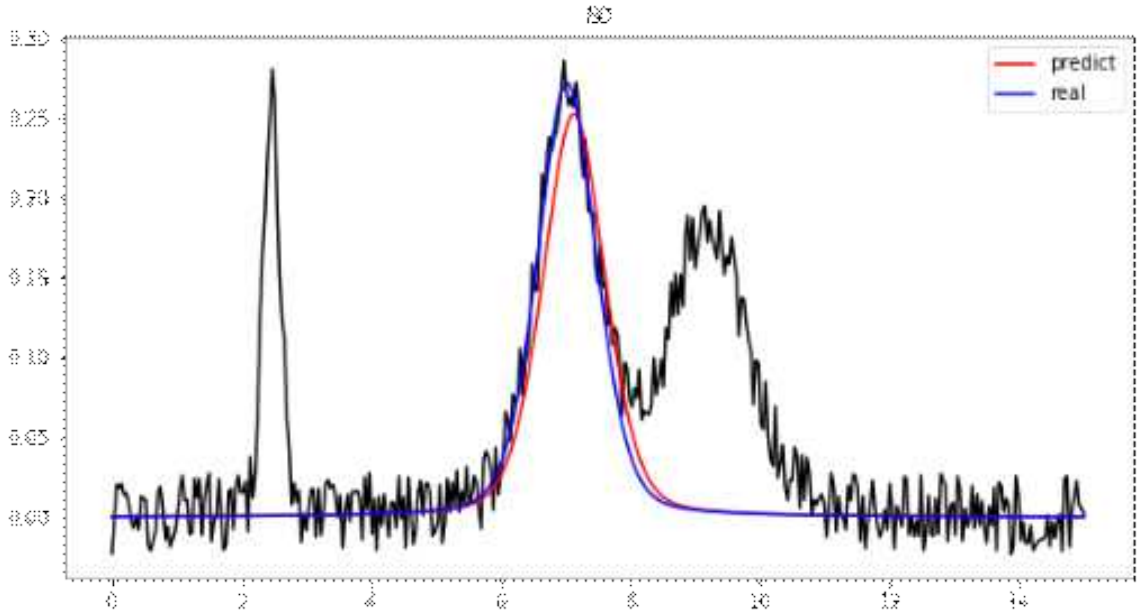
i) 11 convolution layers

iI) 32x3-64x2-128x2-256x2-512x2 feature map

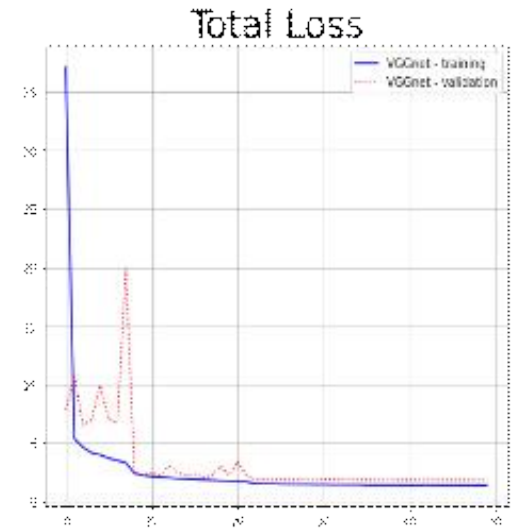
iii) 1,735,403 parameter

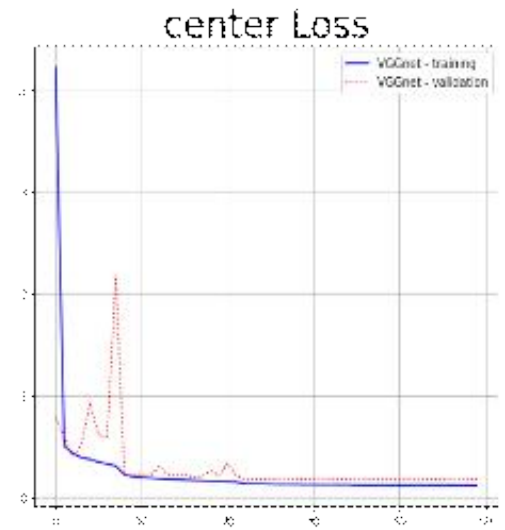


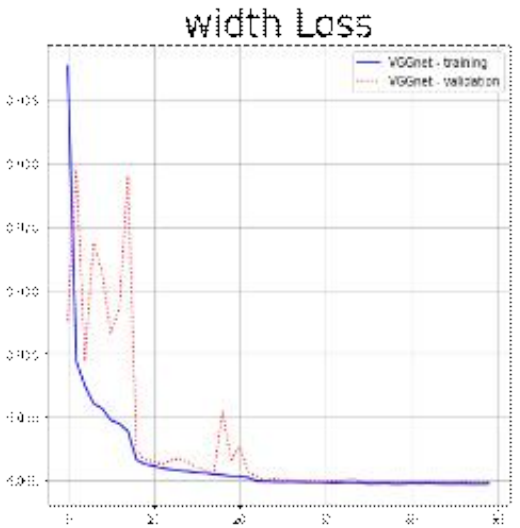
2-3. VGG version-result

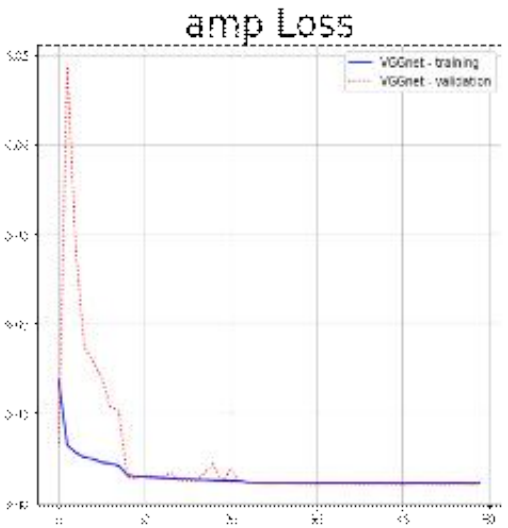


center(mae)	width(mae)	amplitude(mae)
0.1178879	0.0307006	0.0215877

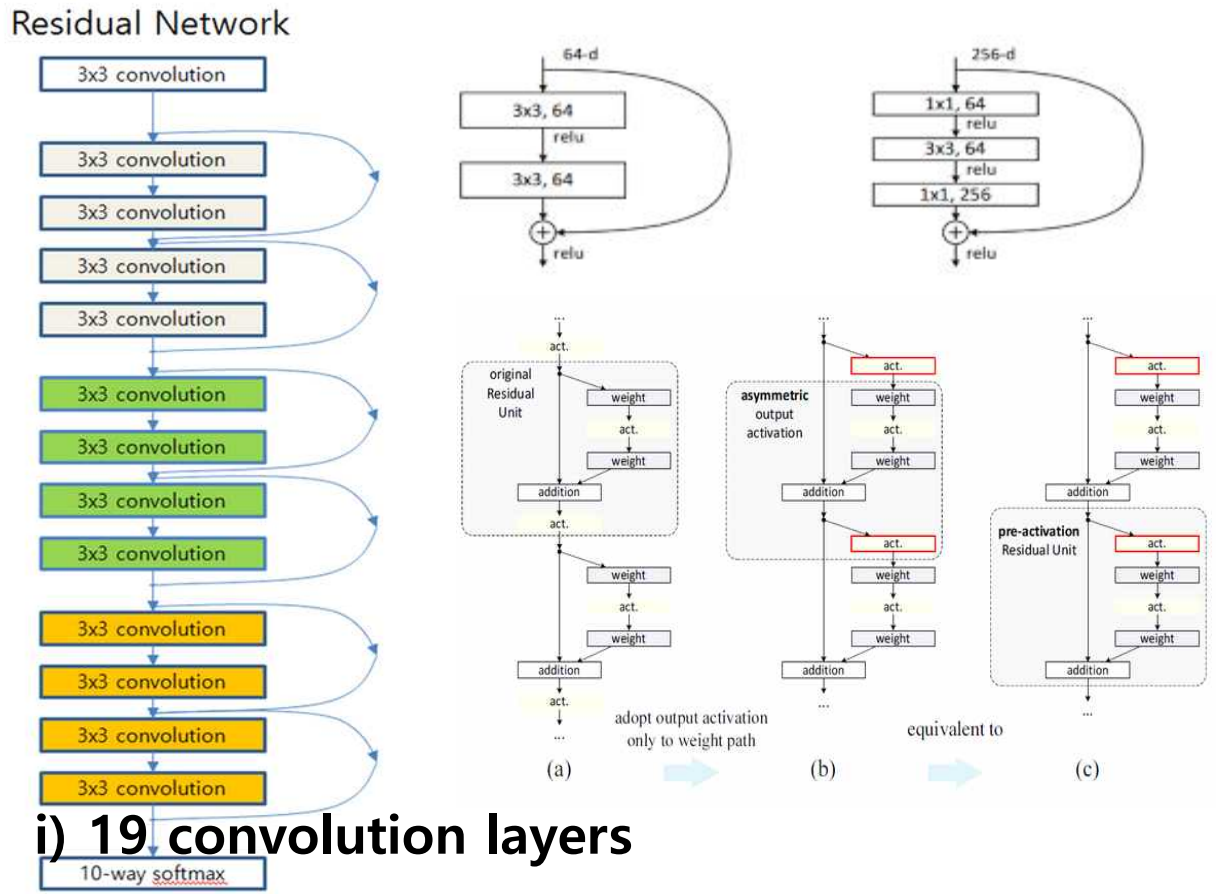


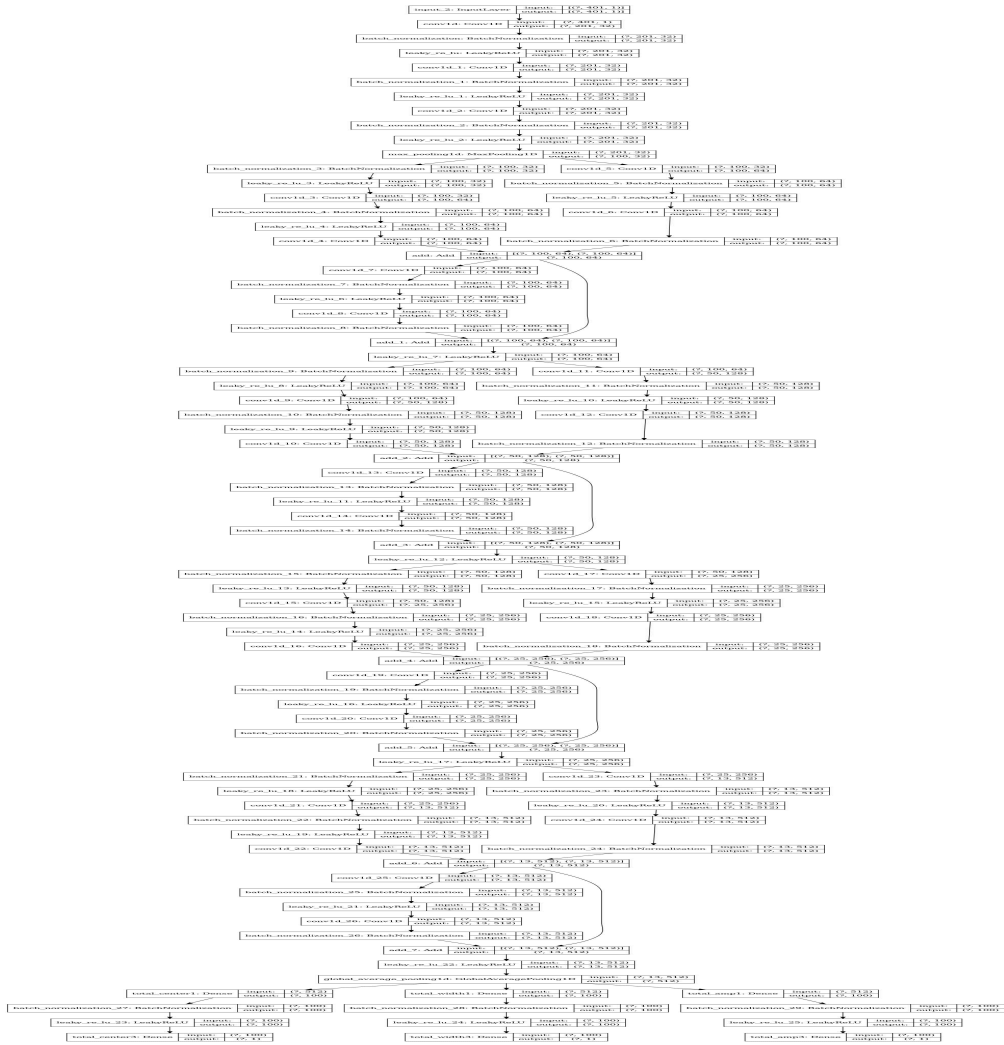






2-4. Resnet version



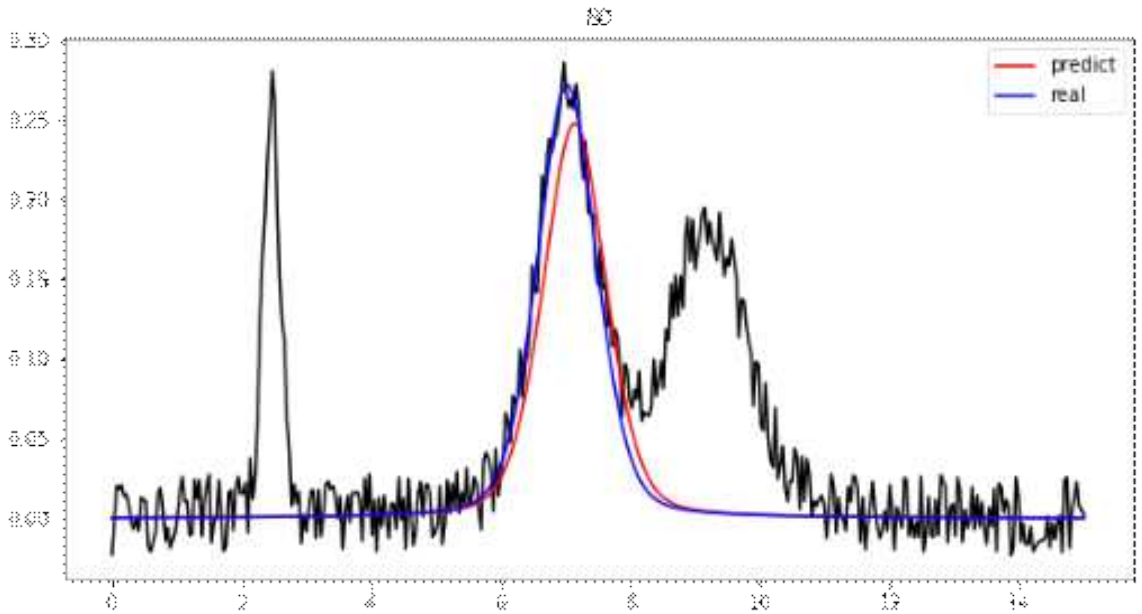


i) 19 convolution layers

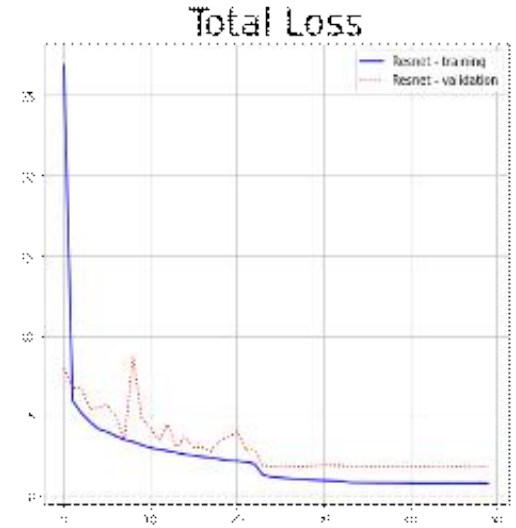
ii) 32x3-64x4-128x4-256x4-512x4 feature map

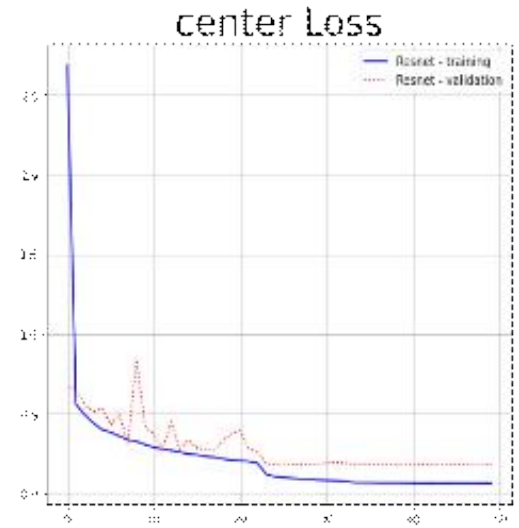
iii) 4,367,979 parameter

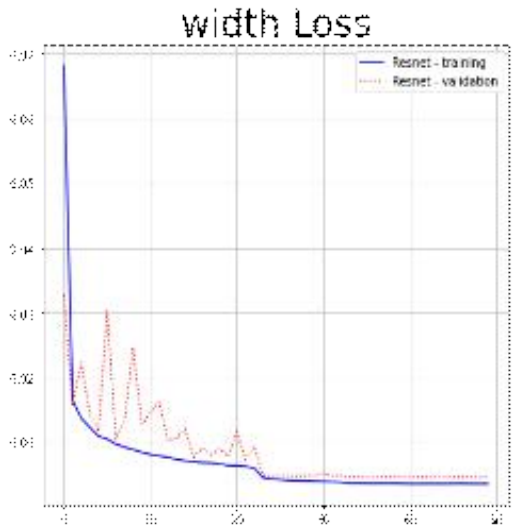
2-4. Resnet version-result

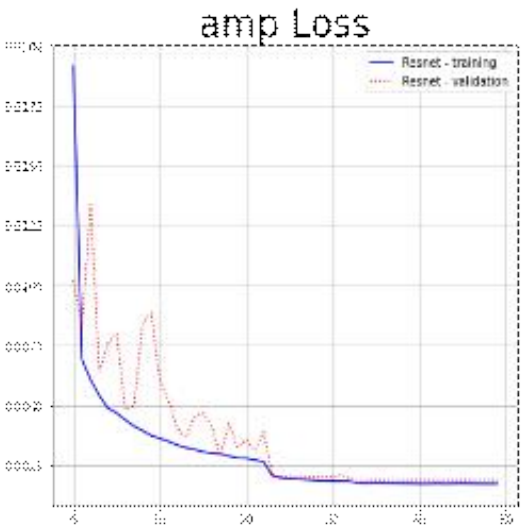


center(mae)	width(mae)	amplitude(mae)
0.1049542	0.029407	0.0196513









2-5. SE-Resnet version

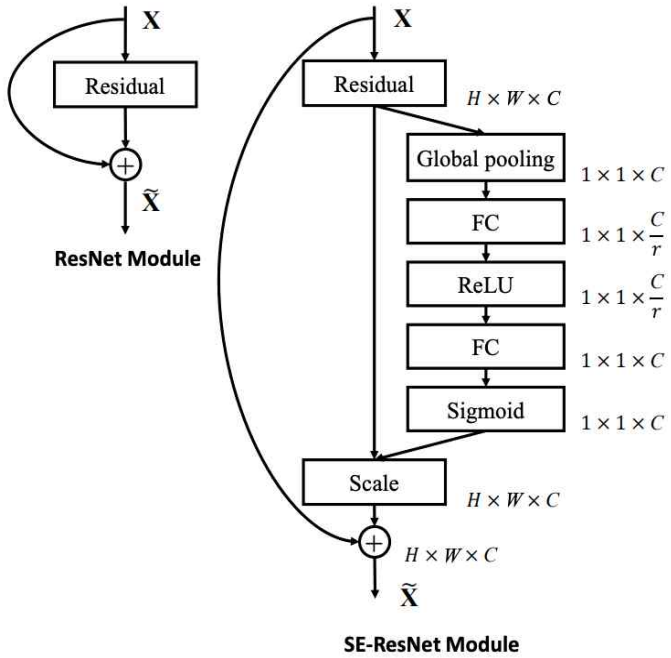


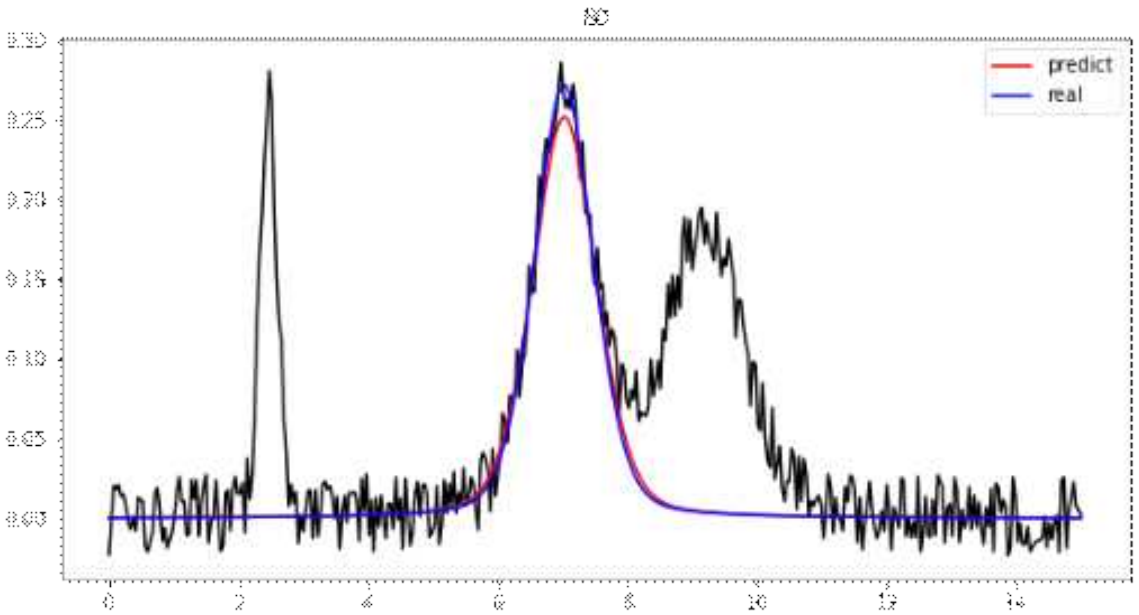
Fig. 3. The schema of the original Residual module (left) and the SE-ResNet module (right).

i) 19 convolution layers

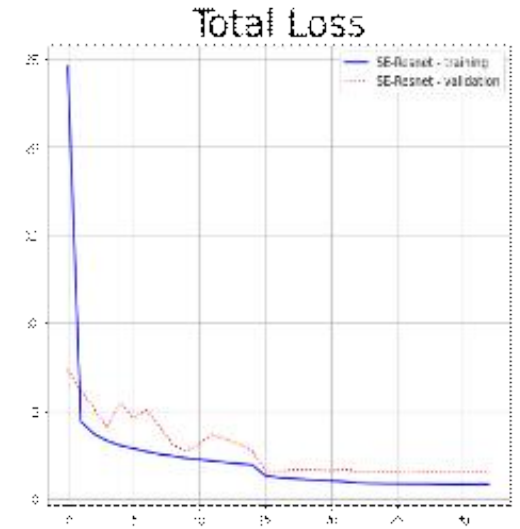
iI) 32x3-64x4-128x4-256x4-512x4 feature map

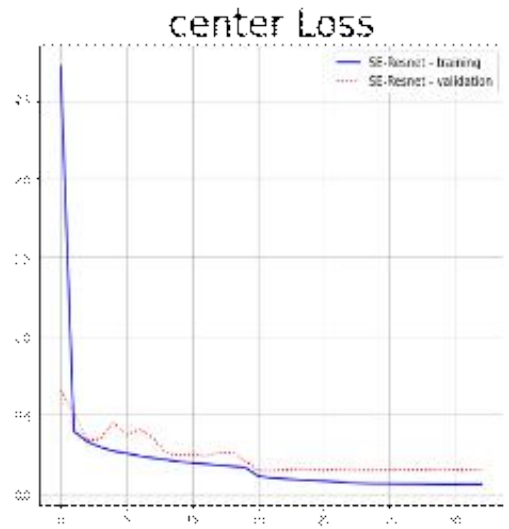
iii) 4,457,059 parameter

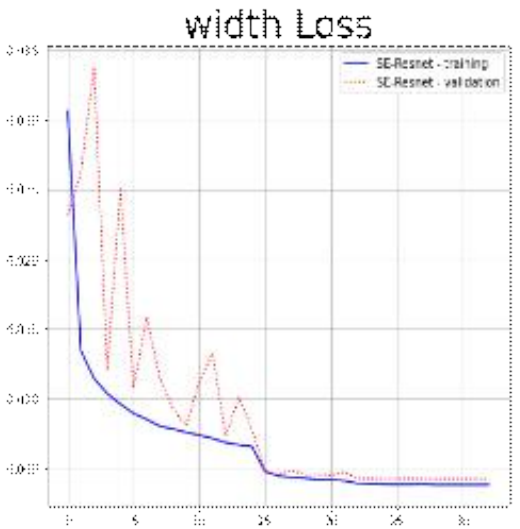
2-5. SE-Resnet version-result

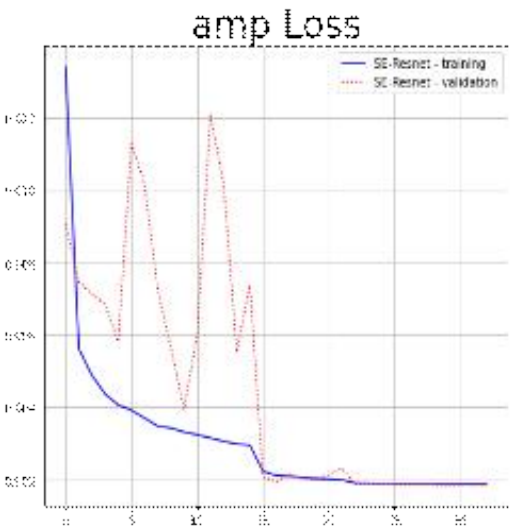


center(mae)	width(mae)	amplitude(mae)
0.0773142	0.0280563	0.0194942

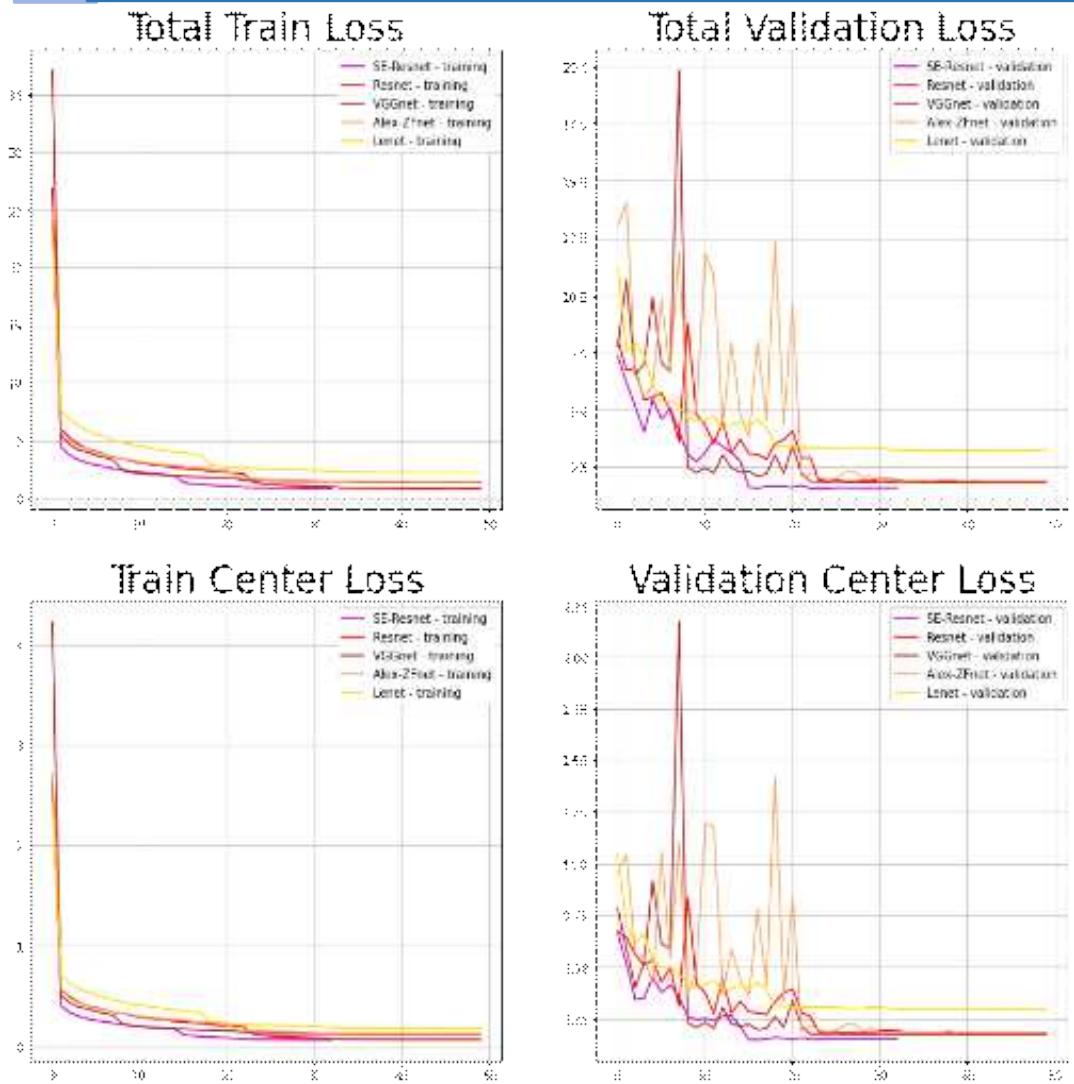








3. Organize Architecture Result



Architecture	center(mae)	width(mae)	amplitude(mae)
Lenet	0.1671945	0.0503014	0.033903
Alex-ZFnet	0.1401316	0.0307828	0.020378
VGGnet	0.1178879	0.0307006	0.021587
Resnet	0.1049542	0.029407	0.019651
SE-Resnet	0.0773142	0.028056	0.019494