Deep Learning im



ray Photoelectron

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tory: Seong-Heum. Park

Ab-initio Electr

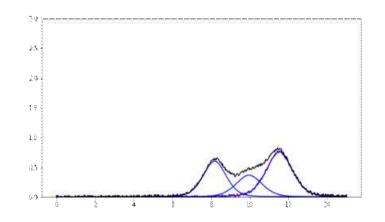
content

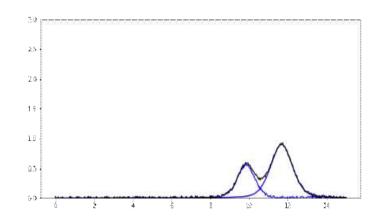
01 Data information

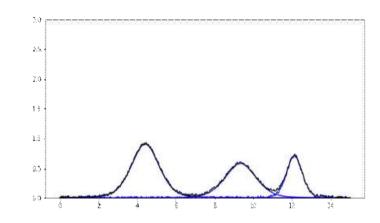
02 Architectures accuracy

Organize architectures

1. Train Data (0.9 million)

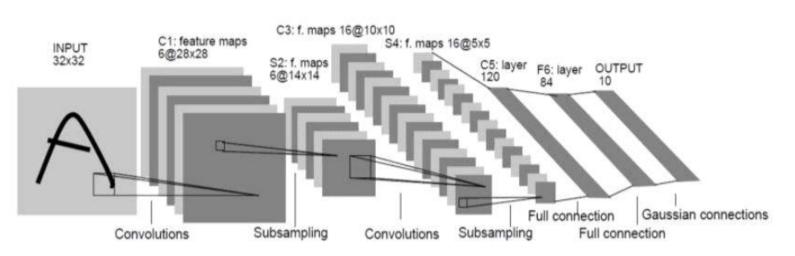




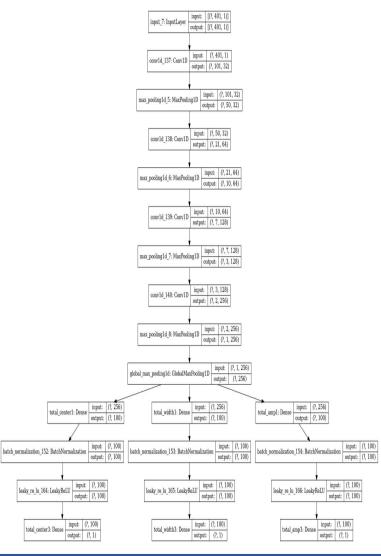


- i) data: peak1~3까지의 랜덤된 조합으로 이루어진 그래프
- ii) label: 그래프 속의 가장 area가 큰 peak의 center, width, amp

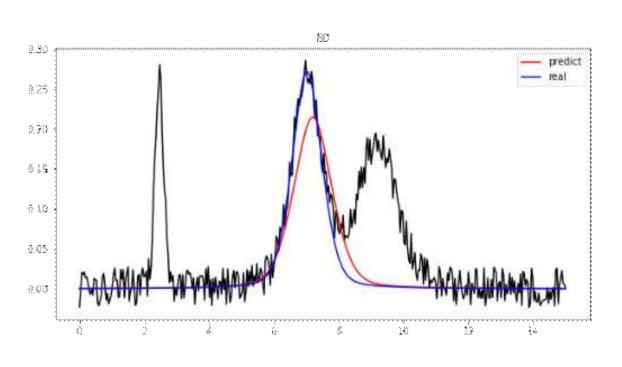
2-1. Lenet version



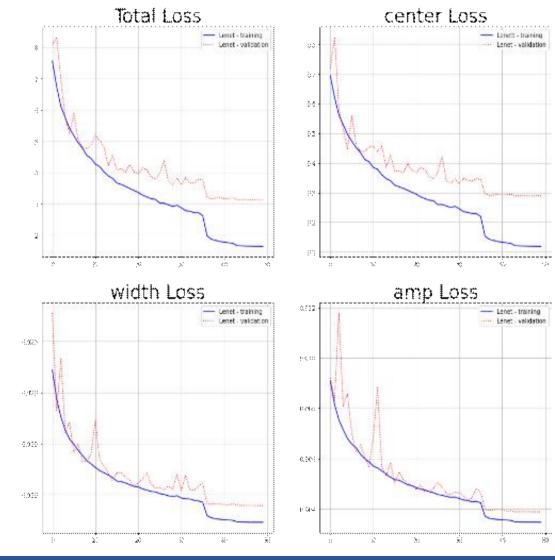
- i) 4 convolution layers
- il) 32x1-64x1-128x1-256x1 feature map
- iii) 201,067 parameter



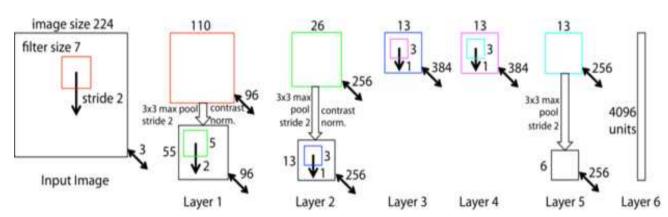
2-1. Lenet version-result



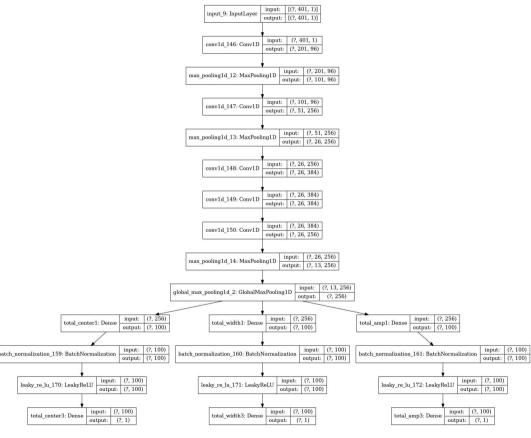
center(mae)	width(mae)	amplitude(mae)
0.1671945	0.0503014	0.0339030



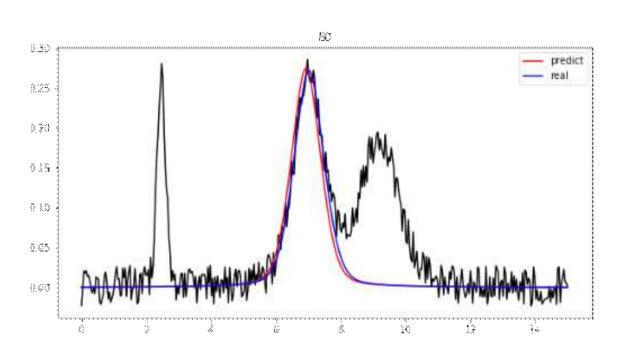
2-2. Alex+ZFnet version



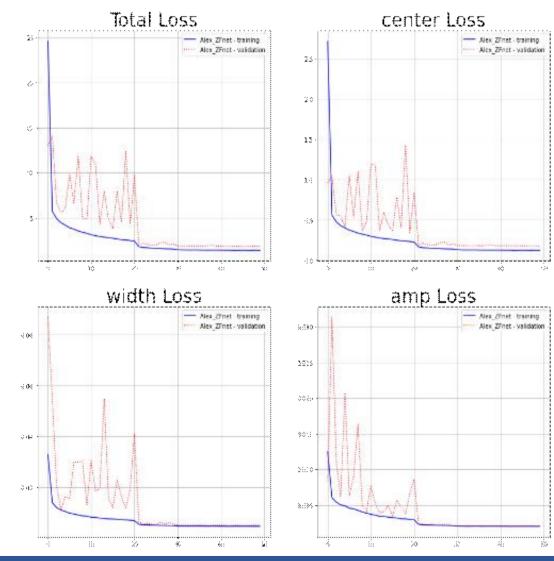
- i) 5 convolution layers
- il) 96x1-256x1-384x2-256x1 feature map
- iii) 1,581,035 parameter



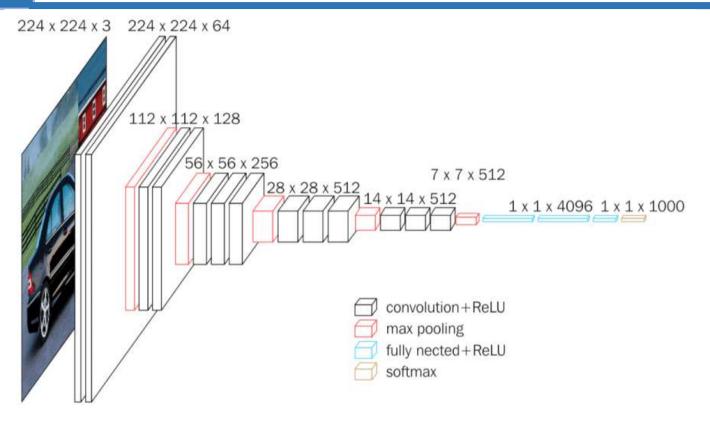
2-2. Alex+ZFnet version-result



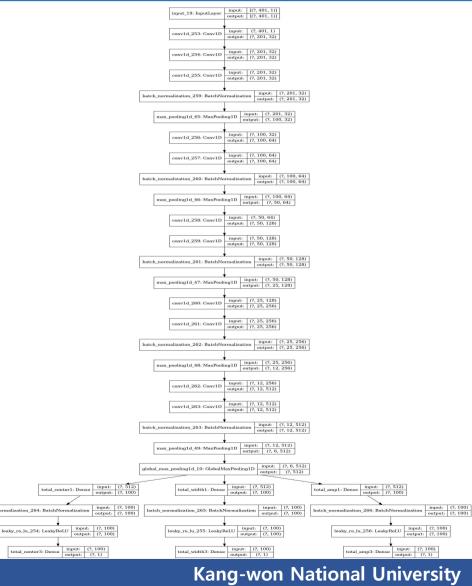
center(mae)	width(mae)	amplitude(mae)
0.1401316	0.0307828	0.0203787



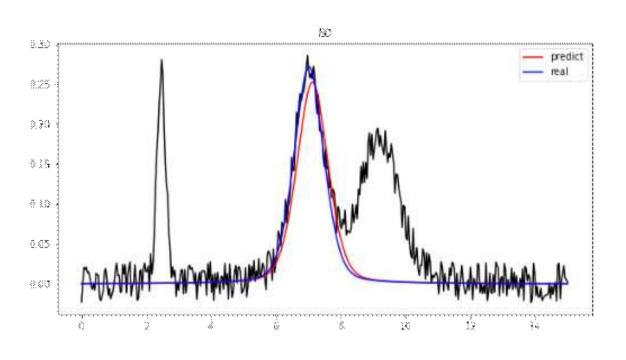
2-3. VGG version



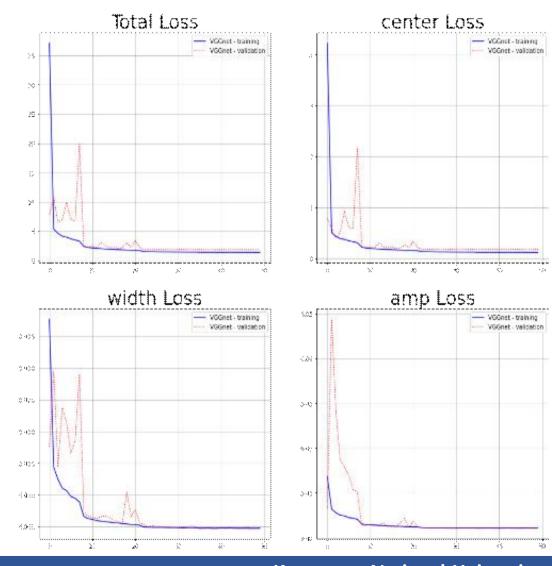
- i) 11 convolution layers
- il) 32x3-64x2-128x2-256x2-512x2 feature map
- iii) 1,735,403 parameter



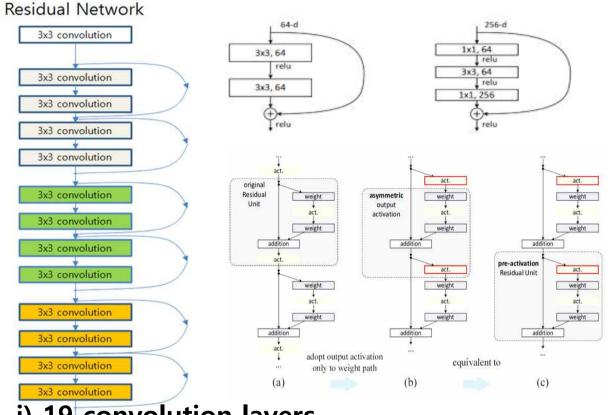
2-3. VGG version-result



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



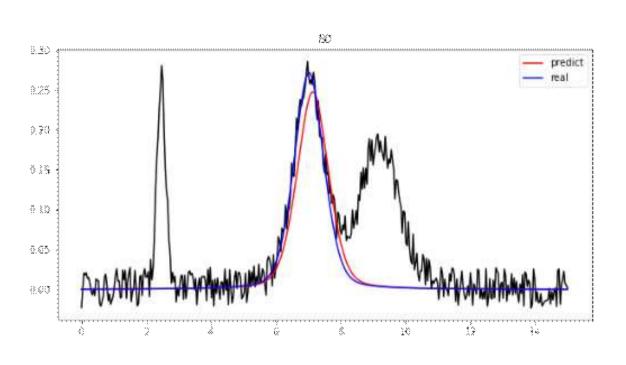
2-4. Resnet version



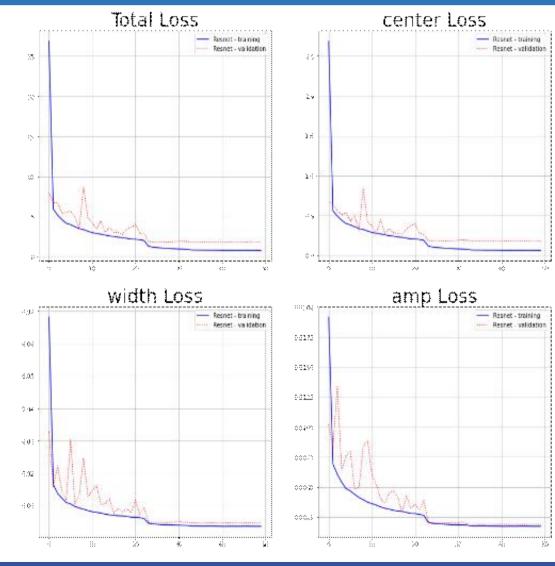
- 19 convolution layers 10-way softmax
- il) 32x3-64x4-128x4-256x4-512x4 feature map
- iii) 4,367,979 parameter

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                                                                                                                                                                                                                                                                                                                                      convid_A. Convis | imput. (v, 188, 8A) | batch_normalization_B. Batch
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                                                                                                                                                                                            hatch_normalization_0 BatchPlormalization | input | 19, 1996, 885 |
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                                                                                                                                                                                                                                                                      comvid_13. ComviD | Juguet | (3. 80, 128)
                                                                                                                                                                                         CONVIA 14: CONVIET | CONTINUE | CO. SEC. 1285
                                                                                                                                                                                         batch normalization 14: BatchPormalization | Supris | O: 50, 120)
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                                                                                                                                                                                                                                            100 D. Add | 100 | 100 AD | 10
                                                                                                                                                                                tooky_ro_ts_ts_teakyBatat | topic (9, an, ann) | batch_normalication_an_BatchPor
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                                                                                                                                                                                            mmv1st_22: Comv1D | mpmt: [19, 13, 812] | haush
                                                                                                                                                                                                                                                                                                                             mantum | mantum | 52: 13: 3133 |
                                                                                                                                                                                                                                                                                                                          | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 
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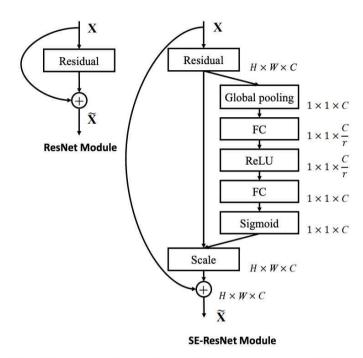
2-4. Resnet version-result



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



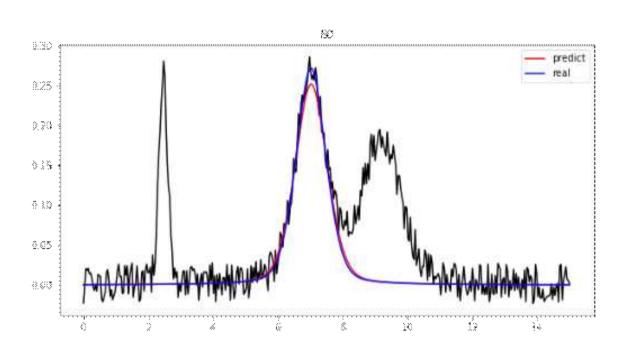
2-5. SE-Resnet version



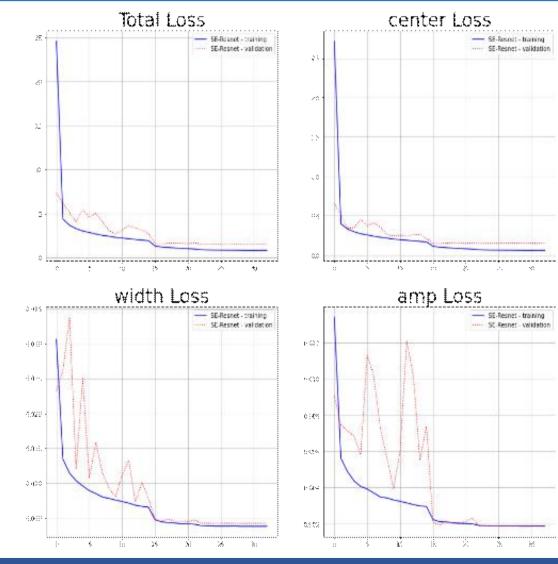
- Fig. 3. The schema of the original Residual module (left) and the SE-ResNet module (right).
- i) 19 convolution layers
- il) 32x3-64x4-128x4-256x4-512x4 feature map
- iii) 4,457,059 parameter



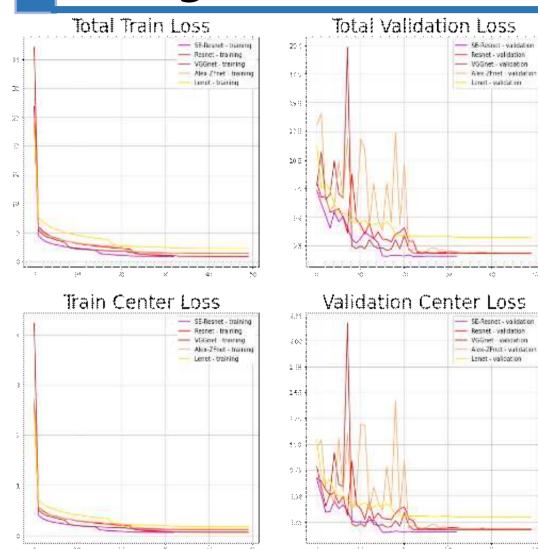
2-5. SE-Resnet version-result



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