**EfficientNetv2\_s,** training batch size=**128**, testing bs=**128,** optimizer=**SGD, lr=0.02**, **epoch=70**

+ RandomHorizontalFlip() + RandomCrop(32, padding=4)

epoch 1, loss 2.1142, train acc 0.298, test acc 0.237, time 95.4 sec

epoch 2, loss 0.8088, train acc 0.413, test acc 0.278, time 95.4 sec

epoch 3, loss 0.4834, train acc 0.473, test acc 0.304, time 97.4 sec

epoch 4, loss 0.3424, train acc 0.493, test acc 0.315, time 99.9 sec

epoch 5, loss 0.2640, train acc 0.513, test acc 0.320, time 101.8 sec

epoch 6, loss 0.2120, train acc 0.525, test acc 0.327, time 102.7 sec

epoch 7, loss 0.1701, train acc 0.545, test acc 0.352, time 104.1 sec

epoch 8, loss 0.1432, train acc 0.568, test acc 0.354, time 104.1 sec

epoch 9, loss 0.1215, train acc 0.580, test acc 0.352, time 104.9 sec

epoch 10, loss 0.1082, train acc 0.590, test acc 0.374, time 105.5 sec

epoch 11, loss 0.0929, train acc 0.608, test acc 0.375, time 105.8 sec

epoch 12, loss 0.0825, train acc 0.624, test acc 0.380, time 105.5 sec

epoch 13, loss 0.0737, train acc 0.635, test acc 0.381, time 106.0 sec

epoch 14, loss 0.0663, train acc 0.643, test acc 0.394, time 106.0 sec

epoch 15, loss 0.0597, train acc 0.655, test acc 0.396, time 105.7 sec

epoch 16, loss 0.0542, train acc 0.670, test acc 0.405, time 105.8 sec

epoch 17, loss 0.0495, train acc 0.678, test acc 0.411, time 105.9 sec

epoch 18, loss 0.0449, train acc 0.694, test acc 0.414, time 105.9 sec

epoch 19, loss 0.0422, train acc 0.695, test acc 0.416, time 106.2 sec

epoch 20, loss 0.0382, train acc 0.709, test acc 0.418, time 106.2 sec

epoch 21, loss 0.0354, train acc 0.717, test acc 0.426, time 106.3 sec

epoch 22, loss 0.0332, train acc 0.722, test acc 0.427, time 106.1 sec

epoch 23, loss 0.0303, train acc 0.734, test acc 0.428, time 106.2 sec

epoch 24, loss 0.0285, train acc 0.743, test acc 0.429, time 106.2 sec

epoch 25, loss 0.0264, train acc 0.749, test acc 0.440, time 106.5 sec

epoch 26, loss 0.0248, train acc 0.756, test acc 0.437, time 105.9 sec

epoch 27, loss 0.0228, train acc 0.767, test acc 0.441, time 106.3 sec

epoch 28, loss 0.0217, train acc 0.770, test acc 0.444, time 106.3 sec

epoch 29, loss 0.0201, train acc 0.781, test acc 0.452, time 106.2 sec

epoch 30, loss 0.0191, train acc 0.785, test acc 0.458, time 106.2 sec

epoch 31, loss 0.0181, train acc 0.786, test acc 0.456, time 106.4 sec

epoch 32, loss 0.0175, train acc 0.787, test acc 0.441, time 106.7 sec

epoch 33, loss 0.0166, train acc 0.795, test acc 0.459, time 106.4 sec

epoch 34, loss 0.0155, train acc 0.798, test acc 0.463, time 106.4 sec

epoch 35, loss 0.0148, train acc 0.803, test acc 0.466, time 106.3 sec

epoch 36, loss 0.0140, train acc 0.810, test acc 0.472, time 106.5 sec

epoch 37, loss 0.0132, train acc 0.820, test acc 0.469, time 106.9 sec

epoch 38, loss 0.0126, train acc 0.820, test acc 0.469, time 106.4 sec

epoch 39, loss 0.0125, train acc 0.818, test acc 0.467, time 106.4 sec

epoch 40, loss 0.0120, train acc 0.823, test acc 0.462, time 106.1 sec

epoch 41, loss 0.0112, train acc 0.828, test acc 0.477, time 106.6 sec

epoch 42, loss 0.0108, train acc 0.829, test acc 0.475, time 106.4 sec

epoch 43, loss 0.0101, train acc 0.838, test acc 0.467, time 106.3 sec

epoch 44, loss 0.0098, train acc 0.839, test acc 0.468, time 106.5 sec

epoch 45, loss 0.0094, train acc 0.844, test acc 0.484, time 106.2 sec

epoch 46, loss 0.0092, train acc 0.841, test acc 0.477, time 106.7 sec

epoch 47, loss 0.0093, train acc 0.838, test acc 0.478, time 106.4 sec

epoch 48, loss 0.0092, train acc 0.836, test acc 0.474, time 107.0 sec

epoch 49, loss 0.0087, train acc 0.843, test acc 0.473, time 106.3 sec

epoch 50, loss 0.0084, train acc 0.843, test acc 0.474, time 106.7 sec

epoch 51, loss 0.0084, train acc 0.841, test acc 0.484, time 106.7 sec

epoch 52, loss 0.0078, train acc 0.848, test acc 0.473, time 106.5 sec

epoch 53, loss 0.0074, train acc 0.852, test acc 0.473, time 106.8 sec

epoch 54, loss 0.0078, train acc 0.843, test acc 0.483, time 106.7 sec

epoch 55, loss 0.0073, train acc 0.854, test acc 0.477, time 107.1 sec

epoch 56, loss 0.0076, train acc 0.842, test acc 0.471, time 106.6 sec

epoch 57, loss 0.0070, train acc 0.853, test acc 0.475, time 107.2 sec

epoch 58, loss 0.0066, train acc 0.857, test acc 0.480, time 106.8 sec

epoch 59, loss 0.0065, train acc 0.857, test acc 0.480, time 107.3 sec

epoch 60, loss 0.0064, train acc 0.858, test acc 0.485, time 107.1 sec

epoch 61, loss 0.0045, train acc 0.902, test acc 0.505, time 106.8 sec

epoch 62, loss 0.0036, train acc 0.918, test acc 0.505, time 107.1 sec

epoch 63, loss 0.0033, train acc 0.924, test acc 0.508, time 107.1 sec

epoch 64, loss 0.0031, train acc 0.928, test acc 0.507, time 107.5 sec

epoch 65, loss 0.0029, train acc 0.931, test acc 0.506, time 106.8 sec

epoch 66, loss 0.0027, train acc 0.934, test acc 0.504, time 106.6 sec

epoch 67, loss 0.0026, train acc 0.938, test acc 0.506, time 107.0 sec

epoch 68, loss 0.0025, train acc 0.940, test acc 0.502, time 106.2 sec

epoch 69, loss 0.0024, train acc 0.941, test acc 0.506, time 106.7 sec

epoch 70, loss 0.0023, train acc 0.942, test acc 0.502, time 106.8 sec

Validation: Accuracy of the network: 84.46666666666667 %

OOD accuracy without the "unknown" label: Accuracy of the network: 50.18 %

threshold is 0.00:

Threshold accuracy: 50.260 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.3730564099311829

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.27525478749275206

threshold is 0.05:

Threshold accuracy: 50.260 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.3730564099311829

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.27525478749275206

threshold is 0.10:

Threshold accuracy: 50.260 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.3730564099311829

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.27525478749275206

threshold is 0.15:

Threshold accuracy: 50.260 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.3730564099311829

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.27525478749275206

threshold is 0.20:

Threshold accuracy: 50.260 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.3730564099311829

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.27525478749275206

threshold is 0.25:

Threshold accuracy: 50.260 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.3730564099311829

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.27525478749275206

threshold is 0.30:

Threshold accuracy: 50.260 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.3730564099311829

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.27525478749275206

threshold is 0.35:

Threshold accuracy: 50.380 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.373883980846405

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.24008195424079895

threshold is 0.40:

Threshold accuracy: 50.750 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.37457686290740966

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.15418648457527162

threshold is 0.45:

Threshold accuracy: 51.580 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.37516127490997314

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.10046636624336241

threshold is 0.50:

Threshold accuracy: 52.740 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.37628399896621706

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.08247449879646304

threshold is 0.55:

Threshold accuracy: 53.940 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.3764256771087646

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.07861263926029204

threshold is 0.60:

Threshold accuracy: 55.280 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.3745129608154297

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.07847128462791442

threshold is 0.65:

Threshold accuracy: 56.440 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.37167648010253906

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.07847128462791442

threshold is 0.70:

Threshold accuracy: 57.720 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.36809396057128907

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.07842811821699142

threshold is 0.75:

Threshold accuracy: 59.030 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.36387671966552737

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.07842811821699142

threshold is 0.80:

Threshold accuracy: 60.080 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.35758970794677736

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.07837170127481222

threshold is 0.85:

Threshold accuracy: 61.100 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.3517524596214294

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.07837170127481222

threshold is 0.90:

Threshold accuracy: 62.470 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.3447811065673828

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.07837170127481222

threshold is 0.95:

Threshold accuracy: 63.340 %

Brier before calibration: 0.7672512063901312

ECE before calibration: 0.33423685207366943

calibrating...

Brier temperature\_scaling calibration: 0.6656116198931219

ECE temperature\_scaling calibration: 0.07837170127481222