loss\_ev\_val2, acc\_ev\_val2, loss\_ev\_train2, acc\_ev\_train2 = image\_classification(0.01, 0.85, 20, 0.55)

epoch: 1, steps: 0, train\_loss: 2.303, running\_acc: 6.2 %

epoch: 1, steps: 200, train\_loss: 2.300, running\_acc: 11.3 %

epoch: 1, steps: 400, train\_loss: 2.128, running\_acc: 23.0 %

epoch: 1, steps: 600, train\_loss: 1.917, running\_acc: 31.0 %

epoch: 1, steps: 800, train\_loss: 1.707, running\_acc: 37.9 %

epoch: 1, steps: 1000, train\_loss: 1.599, running\_acc: 42.0 %

epoch: 1, steps: 1200, train\_loss: 1.484, running\_acc: 46.0 %

epoch: 1, steps: 1400, train\_loss: 1.445, running\_acc: 47.1 %

Validation accuracy: 53.4 %

epoch: 2, steps: 0, train\_loss: 1.473, running\_acc: 43.8 %

epoch: 2, steps: 200, train\_loss: 1.311, running\_acc: 52.0 %

epoch: 2, steps: 400, train\_loss: 1.259, running\_acc: 54.2 %

epoch: 2, steps: 600, train\_loss: 1.231, running\_acc: 55.8 %

epoch: 2, steps: 800, train\_loss: 1.164, running\_acc: 58.9 %

epoch: 2, steps: 1000, train\_loss: 1.149, running\_acc: 58.5 %

epoch: 2, steps: 1200, train\_loss: 1.100, running\_acc: 60.1 %

epoch: 2, steps: 1400, train\_loss: 1.109, running\_acc: 60.1 %

Validation accuracy: 65.7 %

epoch: 3, steps: 0, train\_loss: 0.988, running\_acc: 56.2 %

epoch: 3, steps: 200, train\_loss: 1.009, running\_acc: 63.7 %

epoch: 3, steps: 400, train\_loss: 0.993, running\_acc: 64.9 %

epoch: 3, steps: 600, train\_loss: 0.991, running\_acc: 64.5 %

epoch: 3, steps: 800, train\_loss: 0.947, running\_acc: 67.0 %

epoch: 3, steps: 1000, train\_loss: 0.939, running\_acc: 66.9 %

epoch: 3, steps: 1200, train\_loss: 0.895, running\_acc: 67.8 %

epoch: 3, steps: 1400, train\_loss: 0.931, running\_acc: 66.8 %

Validation accuracy: 72.1 %

epoch: 4, steps: 0, train\_loss: 0.859, running\_acc: 75.0 %

epoch: 4, steps: 200, train\_loss: 0.835, running\_acc: 69.6 %

epoch: 4, steps: 400, train\_loss: 0.844, running\_acc: 70.2 %

epoch: 4, steps: 600, train\_loss: 0.834, running\_acc: 70.1 %

epoch: 4, steps: 800, train\_loss: 0.817, running\_acc: 71.4 %

epoch: 4, steps: 1000, train\_loss: 0.812, running\_acc: 70.7 %

epoch: 4, steps: 1200, train\_loss: 0.780, running\_acc: 72.0 %

epoch: 4, steps: 1400, train\_loss: 0.804, running\_acc: 71.2 %

Validation accuracy: 74.8 %

epoch: 5, steps: 0, train\_loss: 0.650, running\_acc: 81.2 %

epoch: 5, steps: 200, train\_loss: 0.737, running\_acc: 73.9 %

epoch: 5, steps: 400, train\_loss: 0.744, running\_acc: 73.1 %

epoch: 5, steps: 600, train\_loss: 0.727, running\_acc: 74.3 %

epoch: 5, steps: 800, train\_loss: 0.718, running\_acc: 75.3 %

epoch: 5, steps: 1000, train\_loss: 0.712, running\_acc: 74.6 %

epoch: 5, steps: 1200, train\_loss: 0.694, running\_acc: 75.4 %

epoch: 5, steps: 1400, train\_loss: 0.716, running\_acc: 74.3 %

Validation accuracy: 76.0 %

epoch: 6, steps: 0, train\_loss: 0.829, running\_acc: 65.6 %

epoch: 6, steps: 200, train\_loss: 0.655, running\_acc: 76.6 %

epoch: 6, steps: 400, train\_loss: 0.663, running\_acc: 76.8 %

epoch: 6, steps: 600, train\_loss: 0.643, running\_acc: 77.4 %

epoch: 6, steps: 800, train\_loss: 0.647, running\_acc: 77.5 %

epoch: 6, steps: 1000, train\_loss: 0.642, running\_acc: 77.3 %

epoch: 6, steps: 1200, train\_loss: 0.619, running\_acc: 78.0 %

epoch: 6, steps: 1400, train\_loss: 0.644, running\_acc: 77.4 %

Validation accuracy: 77.1 %

epoch: 7, steps: 0, train\_loss: 0.568, running\_acc: 81.2 %

epoch: 7, steps: 200, train\_loss: 0.581, running\_acc: 79.5 %

epoch: 7, steps: 400, train\_loss: 0.598, running\_acc: 79.0 %

epoch: 7, steps: 600, train\_loss: 0.605, running\_acc: 78.3 %

epoch: 7, steps: 800, train\_loss: 0.592, running\_acc: 79.1 %

epoch: 7, steps: 1000, train\_loss: 0.585, running\_acc: 79.8 %

epoch: 7, steps: 1200, train\_loss: 0.572, running\_acc: 79.3 %

epoch: 7, steps: 1400, train\_loss: 0.595, running\_acc: 78.8 %

Validation accuracy: 77.5 %

epoch: 8, steps: 0, train\_loss: 0.566, running\_acc: 81.2 %

epoch: 8, steps: 200, train\_loss: 0.550, running\_acc: 80.6 %

epoch: 8, steps: 400, train\_loss: 0.550, running\_acc: 80.7 %

epoch: 8, steps: 600, train\_loss: 0.552, running\_acc: 79.7 %

epoch: 8, steps: 800, train\_loss: 0.542, running\_acc: 81.1 %

epoch: 8, steps: 1000, train\_loss: 0.536, running\_acc: 81.4 %

epoch: 8, steps: 1200, train\_loss: 0.529, running\_acc: 81.8 %

epoch: 8, steps: 1400, train\_loss: 0.547, running\_acc: 80.2 %

Validation accuracy: 78.2 %

epoch: 9, steps: 0, train\_loss: 0.581, running\_acc: 81.2 %

epoch: 9, steps: 200, train\_loss: 0.505, running\_acc: 82.0 %

epoch: 9, steps: 400, train\_loss: 0.514, running\_acc: 81.9 %

epoch: 9, steps: 600, train\_loss: 0.494, running\_acc: 82.4 %

epoch: 9, steps: 800, train\_loss: 0.486, running\_acc: 82.5 %

epoch: 9, steps: 1000, train\_loss: 0.494, running\_acc: 82.7 %

epoch: 9, steps: 1200, train\_loss: 0.490, running\_acc: 82.8 %

epoch: 9, steps: 1400, train\_loss: 0.506, running\_acc: 81.7 %

Validation accuracy: 77.6 %

epoch: 10, steps: 0, train\_loss: 0.506, running\_acc: 78.1 %

epoch: 10, steps: 200, train\_loss: 0.453, running\_acc: 84.1 %

epoch: 10, steps: 400, train\_loss: 0.473, running\_acc: 83.5 %

epoch: 10, steps: 600, train\_loss: 0.454, running\_acc: 84.0 %

epoch: 10, steps: 800, train\_loss: 0.478, running\_acc: 83.2 %

epoch: 10, steps: 1000, train\_loss: 0.448, running\_acc: 84.3 %

epoch: 10, steps: 1200, train\_loss: 0.469, running\_acc: 83.2 %

epoch: 10, steps: 1400, train\_loss: 0.464, running\_acc: 83.9 %

Validation accuracy: 79.6 %

epoch: 11, steps: 0, train\_loss: 0.314, running\_acc: 84.4 %

epoch: 11, steps: 200, train\_loss: 0.434, running\_acc: 85.2 %

epoch: 11, steps: 400, train\_loss: 0.423, running\_acc: 84.9 %

epoch: 11, steps: 600, train\_loss: 0.447, running\_acc: 84.4 %

epoch: 11, steps: 800, train\_loss: 0.415, running\_acc: 85.1 %

epoch: 11, steps: 1000, train\_loss: 0.437, running\_acc: 84.6 %

epoch: 11, steps: 1200, train\_loss: 0.413, running\_acc: 85.5 %

epoch: 11, steps: 1400, train\_loss: 0.445, running\_acc: 84.2 %

Validation accuracy: 79.2 %

epoch: 12, steps: 0, train\_loss: 0.614, running\_acc: 78.1 %

epoch: 12, steps: 200, train\_loss: 0.412, running\_acc: 85.6 %

epoch: 12, steps: 400, train\_loss: 0.407, running\_acc: 85.6 %

epoch: 12, steps: 600, train\_loss: 0.383, running\_acc: 86.1 %

epoch: 12, steps: 800, train\_loss: 0.390, running\_acc: 86.2 %

epoch: 12, steps: 1000, train\_loss: 0.404, running\_acc: 86.1 %

epoch: 12, steps: 1200, train\_loss: 0.378, running\_acc: 86.5 %

epoch: 12, steps: 1400, train\_loss: 0.398, running\_acc: 86.0 %

Validation accuracy: 79.1 %

epoch: 13, steps: 0, train\_loss: 0.300, running\_acc: 87.5 %

epoch: 13, steps: 200, train\_loss: 0.387, running\_acc: 86.4 %

epoch: 13, steps: 400, train\_loss: 0.376, running\_acc: 86.3 %

epoch: 13, steps: 600, train\_loss: 0.390, running\_acc: 86.2 %

epoch: 13, steps: 800, train\_loss: 0.366, running\_acc: 87.5 %

epoch: 13, steps: 1000, train\_loss: 0.370, running\_acc: 86.8 %

epoch: 13, steps: 1200, train\_loss: 0.370, running\_acc: 86.9 %

epoch: 13, steps: 1400, train\_loss: 0.392, running\_acc: 85.8 %

Validation accuracy: 78.2 %

epoch: 14, steps: 0, train\_loss: 0.331, running\_acc: 87.5 %

epoch: 14, steps: 200, train\_loss: 0.364, running\_acc: 86.9 %

epoch: 14, steps: 400, train\_loss: 0.347, running\_acc: 87.5 %

epoch: 14, steps: 600, train\_loss: 0.345, running\_acc: 88.1 %

epoch: 14, steps: 800, train\_loss: 0.348, running\_acc: 87.7 %

epoch: 14, steps: 1000, train\_loss: 0.358, running\_acc: 87.2 %

epoch: 14, steps: 1200, train\_loss: 0.367, running\_acc: 86.8 %

epoch: 14, steps: 1400, train\_loss: 0.365, running\_acc: 87.0 %

Validation accuracy: 78.8 %

epoch: 15, steps: 0, train\_loss: 0.430, running\_acc: 78.1 %

epoch: 15, steps: 200, train\_loss: 0.334, running\_acc: 88.2 %

epoch: 15, steps: 400, train\_loss: 0.350, running\_acc: 87.6 %

epoch: 15, steps: 600, train\_loss: 0.343, running\_acc: 87.8 %

epoch: 15, steps: 800, train\_loss: 0.329, running\_acc: 88.6 %

epoch: 15, steps: 1000, train\_loss: 0.350, running\_acc: 87.5 %

epoch: 15, steps: 1200, train\_loss: 0.327, running\_acc: 88.4 %

epoch: 15, steps: 1400, train\_loss: 0.336, running\_acc: 88.4 %

Validation accuracy: 80.4 %

epoch: 16, steps: 0, train\_loss: 0.254, running\_acc: 90.6 %

epoch: 16, steps: 200, train\_loss: 0.315, running\_acc: 88.5 %

epoch: 16, steps: 400, train\_loss: 0.319, running\_acc: 89.0 %

epoch: 16, steps: 600, train\_loss: 0.327, running\_acc: 88.4 %

epoch: 16, steps: 800, train\_loss: 0.319, running\_acc: 88.9 %

epoch: 16, steps: 1000, train\_loss: 0.328, running\_acc: 88.7 %

epoch: 16, steps: 1200, train\_loss: 0.311, running\_acc: 88.1 %

epoch: 16, steps: 1400, train\_loss: 0.329, running\_acc: 88.5 %

Validation accuracy: 78.4 %

epoch: 17, steps: 0, train\_loss: 0.282, running\_acc: 87.5 %

epoch: 17, steps: 200, train\_loss: 0.301, running\_acc: 89.7 %

epoch: 17, steps: 400, train\_loss: 0.304, running\_acc: 89.2 %

epoch: 17, steps: 600, train\_loss: 0.316, running\_acc: 88.7 %

epoch: 17, steps: 800, train\_loss: 0.319, running\_acc: 88.3 %

epoch: 17, steps: 1000, train\_loss: 0.307, running\_acc: 89.3 %

epoch: 17, steps: 1200, train\_loss: 0.284, running\_acc: 89.9 %

epoch: 17, steps: 1400, train\_loss: 0.319, running\_acc: 88.7 %

Validation accuracy: 81.4 %

epoch: 18, steps: 0, train\_loss: 0.366, running\_acc: 81.2 %

epoch: 18, steps: 200, train\_loss: 0.268, running\_acc: 90.4 %

epoch: 18, steps: 400, train\_loss: 0.299, running\_acc: 89.0 %

epoch: 18, steps: 600, train\_loss: 0.292, running\_acc: 90.1 %

epoch: 18, steps: 800, train\_loss: 0.280, running\_acc: 90.1 %

epoch: 18, steps: 1000, train\_loss: 0.291, running\_acc: 89.6 %

epoch: 18, steps: 1200, train\_loss: 0.302, running\_acc: 89.7 %

epoch: 18, steps: 1400, train\_loss: 0.297, running\_acc: 89.3 %

Validation accuracy: 79.9 %

epoch: 19, steps: 0, train\_loss: 0.451, running\_acc: 84.4 %

epoch: 19, steps: 200, train\_loss: 0.277, running\_acc: 90.0 %

epoch: 19, steps: 400, train\_loss: 0.272, running\_acc: 90.3 %

epoch: 19, steps: 600, train\_loss: 0.290, running\_acc: 89.6 %

epoch: 19, steps: 800, train\_loss: 0.274, running\_acc: 90.4 %

epoch: 19, steps: 1000, train\_loss: 0.287, running\_acc: 90.1 %

epoch: 19, steps: 1200, train\_loss: 0.280, running\_acc: 89.8 %

epoch: 19, steps: 1400, train\_loss: 0.306, running\_acc: 89.4 %

Validation accuracy: 80.4 %

epoch: 20, steps: 0, train\_loss: 0.588, running\_acc: 84.4 %

epoch: 20, steps: 200, train\_loss: 0.278, running\_acc: 90.1 %

epoch: 20, steps: 400, train\_loss: 0.291, running\_acc: 89.5 %

epoch: 20, steps: 600, train\_loss: 0.256, running\_acc: 90.7 %

epoch: 20, steps: 800, train\_loss: 0.278, running\_acc: 90.3 %

epoch: 20, steps: 1000, train\_loss: 0.264, running\_acc: 90.2 %

epoch: 20, steps: 1200, train\_loss: 0.274, running\_acc: 90.3 %

epoch: 20, steps: 1400, train\_loss: 0.265, running\_acc: 90.7 %

Validation accuracy: 81.2 %

best validation accuracy is: (81.4, 17)

Finished Training

Test accuracy: 80.15 %