

REPORT

We added several optimization techniques to speed up the execution. Below is the list of optimizations we performed along with the specific code region in which we performed it.

Forward Propagation :

Region	Region Description	Average Time Naive (ms)	Average Time Optimized (ms)	Percentage Improvement	Techniques	Block size
HS_1	1st Hidden Layer sum	3860.09	2002.73	92.7	Loop Unrolling, Blocking, Loop Interchange	8
HS_2	2nd Hidden Layer sum	2937.55	1530.36	91.9	Loop Unrolling, Blocking, Loop Interchange	20
OS	Output sum	20.27	14.45	40.2	Loop Unrolling, Blocking, Loop Interchange	10

Backward Propagation :

Region	Region Description	Average Time Naive (ms)	Average Time Optimized (ms)	Percentage Improvement	Techniques	Block size
dE_OS, dE_B3	Error with respect to Output Sum and Bias	1403	1394.6	0.64	Loop Fusion	N/A

dE_W1	Error with respect to Weights in hidden layer 1 to hidden layer 2	1952.5	1074	81.75	Loop Unrolling, Loop Blocking	20
dE_W0	Error with respect to Weights in input layer to hidden layer 1	3330.7	1815.4	83.46	Loop Unrolling, Loop Blocking	16
dE_HO_1	Error with respect to output of hidden layer 1	1888.5	1769.1	6.74	Loop Unrolling, Loop Blocking	20
W1	Assign new weights in hidden layer 1	2022.6	1731.2	16.8	Loop Blocking, Loop Unrolling	20
W0	Assign new weights in input layer	3046.8	2669.2	14.14	Loop Blocking, Loop Unrolling	8