Supplementary Material for "Sampling-Based Techniques for Training Deep Neural Networks with Limited Computational Resources: A Scalability Evaluation"

Complementary Experimental Results

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Table 1. Test accuracy of different algorithms w.r.t the # of hidden layers on MNIST

Hidden Layers	MC-approx	ALSH-approx	Standard	Dropout	Adaptive-Dropout
1	92.71%	94.51%	98.01%	17.99%	97.68%
2	98.13%	90.33%	95.83%	93.16%	97.95%
3	98.10%	94.15%	96.05%	90.21%	98.06%
4	98.22%	88.74%	95.89%	78.35%	98.00 %
5	98.36%	70.07%	94.86%	49.90%	97.75%
6	97.69%	21.26%	94.36%	42.01%	98.02%
7	97.64%	25.14%	93.85%	43.54%	98.36%

Table 2. Training time (sec.) of different algorithms w.r.t the # of hidden layers on MNIST

Hidden Layers	MC-approx	ALSH-approx	Standard	Dropout	Adaptive-Dropout
1	1210.5	9845.7	8337.3	11830.9	12156.1
2	1912.5	24840.4	13058.6	17077.2	15463.1
3	1740.0	40375.1	19161.5	56473.3	25292.1
4	2283.9	59389.0	26828.4	108273.7	103041.4
5	25794.2	88268.9	34859.2	40951.1	120156.6
6	31894.5	158226.1	42076.3	153658.0	155359.0
7	11493.1	486321.3	50520.5	164810.9	170182.9

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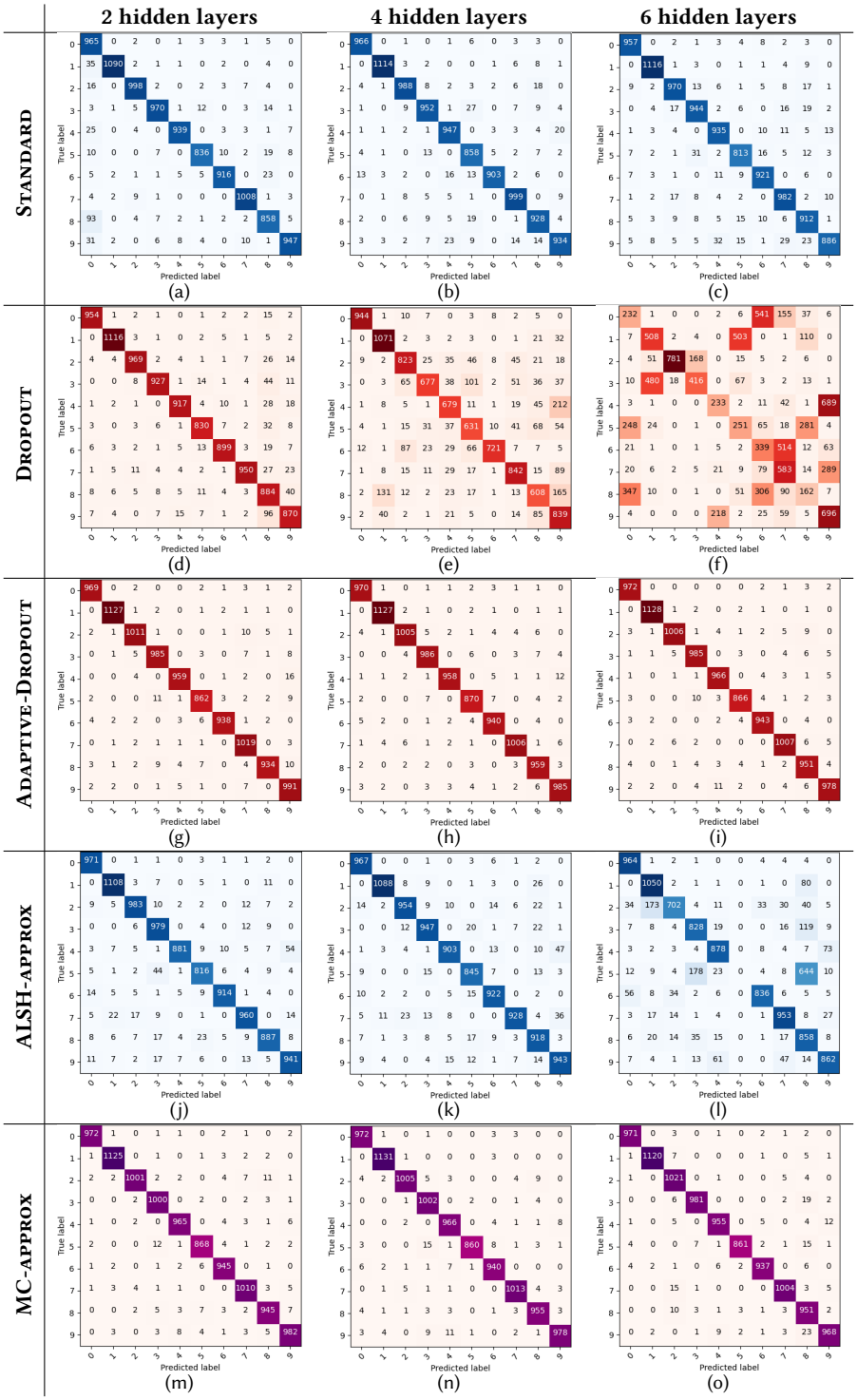

Fig. 1. Confusion matrices of different algorithms for different numbers of hidden layers. In all plots, x-axis and y-axis are the predicted and true labels (0 to 9), respectively.

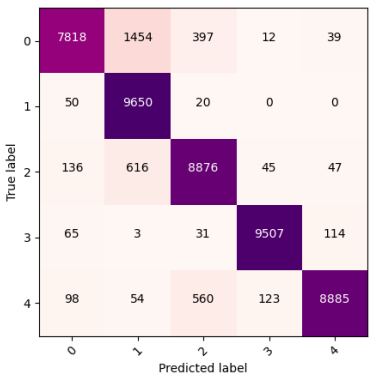

Fig. 2. MC-approx on NORB with 3 hidden layers

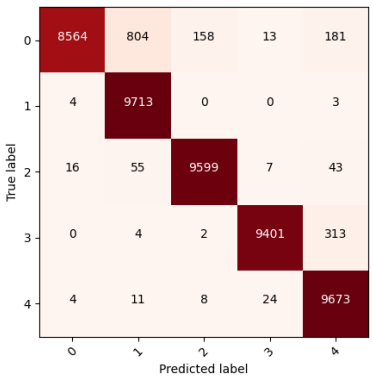

Fig. 3. Adaptive-Dropout on NORB with 3 hidden layers

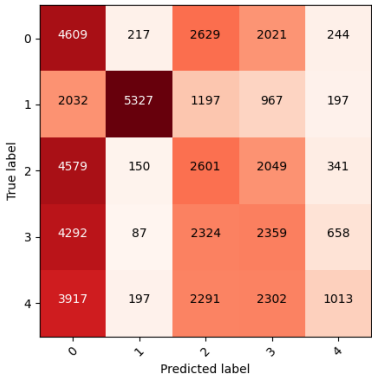

Fig. 4. Dropout on NORB with 3 hidden layers

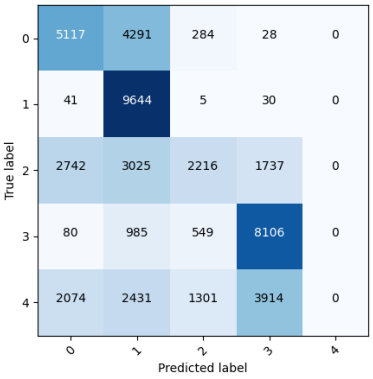

Fig. 5. Standard on NORB with 3 hidden layers

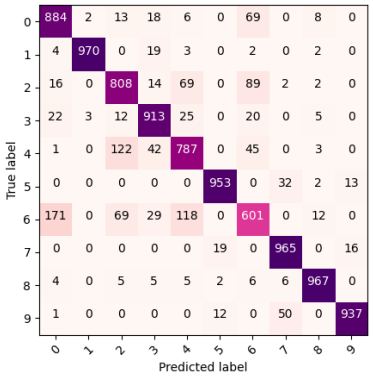

Fig. 6. MC-approx on Fashion-MNIST with 3 hidden layers

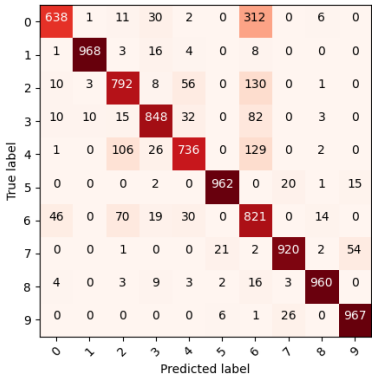

Fig. 7. Adaptive-Dropout on Fashion-MNIST with 3 hidden layers

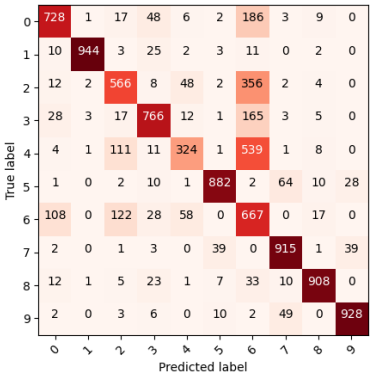

Fig. 8. Dropout on Fashion-MNIST with 3 hidden layers

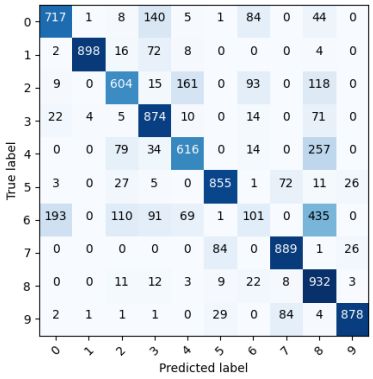

Fig. 9. Standard on Fashion-MNIST with 3 hidden layers

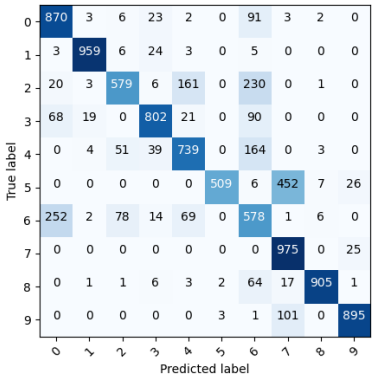

Fig. 10. ALSH-approx on Fashion-MNIST with 3 hidden layers