Catherine Higham

University of Glasgow

Catherine.Higham@glasgow.ac.uk

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Quantum deep learning by sampling neural nets with a quantum annealer
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The contents of this data repository are organised as follows:

Folder /TABLE1/

Contains data and code relating to Table 1 in the paper.

Directory/File Name	Description
S1/ myQ0328_5_8_mysig1_MNIST.csv	Q matrix for feature extraction with 8 5x5 convolutional filters and temperature parameter S ={1,2,3,4,5,6,8}.
S2/ myQ0329_5_8_mysig2_MNIST.csv	
S3/ myQ0330_5_8_mysig3_MNIST.csv	
S4/ myQ0328_5_8_mysig4_MNIST.csv	
S5/ myQ0330_5_8_mysig5_MNIST.csv	
S6/ myQ0330_5_8_mysig6_MNIST.csv	
S8/ myQ0330_5_8_mysig8_MNIST.csv	
S1/ energy_S1W_mysig1_0329_5_8_500_500_100all	QA energy values matrix with 100 rows (representing a 100 different features) and 500 columns (representing 500 samples).
S2/ energy_S1W_mysig2_0329_5_8_500_500_100all	
S3/ energy_S1W_mysig3_0330_5_8_500_500_100all	
S4/ energy_S1W_mysig4_0330_5_8_500_500_100all	
S5/ energy_S1W_mysig5_0330_5_8_500_500_100all	
S6/ energy_S1W_mysig6_0330_5_8_500_500_100all	
S8/ energy_S1W_mysig8_0330_5_8_500_500_100all	
S1/ MNIST_S1W_mysig1_0329_5_8_500_500_100all	Contains QA qubit value {0,1} readout matrix, summed over 500/500 highest energy samples, with 100 rows (different features) and 513 columns representing network nodes (225 visible and 288 hidden).
S2/ MNIST_S2W_mysig2_0329_5_8_500_500_100all	
S3/ MNIST_S3W_mysig3_0330_5_8_500_500_100all	
S4/ MNIST_S4W_mysig4_0330_5_8_500_500_100all	
S5/ MNIST_S5W_mysig5_0330_5_8_500_500_100all	
S6/ MNIST_S6W_mysig6_0330_5_8_500_500_100all	
S8/ MNIST_S8W_mysig8_0330_5_8_500_500_100all	
S1/ MNIST_S1W_mysig1_0329_5_8_100_500_100all	QA qubit value {0,1} readout matrix, summed over 100/500 highest energy samples, with 100 rows (different features) and 513 columns representing network nodes (225 visible and 288 hidden).
S2/ MNIST_S2W_mysig2_0329_5_8_100_500_100all	
S3/ MNIST_S3W_mysig3_0330_5_8_100_500_100all	
S4/ MNIST_S4W_mysig4_0330_5_8_100_500_100all	
S5/ MNIST_S5W_mysig5_0330_5_8_100_500_100all	

S6/ MNIST_S6W_mysig6_0330_5_8_100_500_100all	
S8/ MNIST_S8W_mysig8_0330_5_8_100_500_100all	
myQRBM_pretrained_211117_0330_5_8_v3c_MNIST.py	Illustrative python code for obtaining the samples from the QA.
emb0329_5_8_MNIST.pkl	Embedding used to obtain the samples.
bXTest1104.csv	Input feature matrix with 5000 rows (representing 5000 different test features created from MNIST) and 225 columns (representing 225 visible nodes). Rows 1:10, 501:510, … 4501:4510 with categorical labels 0, 1, … 9 respectively were used to produce the results in this table.

Values can be accessed in MATLAB using **readmatrix()**, for example:
>>E=readmatrix('energy_S1W_mysig1_0329_5_8_500_500_100all').

Folder /TABLE2/

Contains data and code relating to Table 2 in the paper.

File Name	Description
145/ MNIST_1230_146_M8_10_10_x100	QA qubit value {0,1} readout matrix, summed over 10 samples, with 100 rows (different features) and 156/241/476 columns representing network nodes (146/231/466 visible and 10 class) respectively.
230/MNIST_1230_231_M8_10_10_x100	
465/MNIST_1230_466_M8_10_10_x100	
145/ MNIST_1230_146_M8_100_100_x100	QA qubit value {0,1} readout matrix, summed over 100 samples, with 100 rows (different features) and 156/241/476 columns representing network nodes (146/231/466 visible and 10 class) respectively.
145/ MNIST_1230_231_M8_100_100_x100	
145/ MNIST_1230_466_M8_100_100_x100	
145/hbias_146_1230.csv	Input feature matrix with 100 rows (representing 100 different test features created from RBM model) and 146/231/466 columns (representing visible nodes). Rows 1:10, 11:20, … 91:100 with categorical labels 0, 1, … 9 respectively were used to produce the results in this table.
230/ hbias_231_1230.csv	
466/ hbias_466_1230.csv	
145/ wclass.csv	Q matrix for classification with RBM classifier models 145/230/465 respectively.
230/ wclass1209_231.csv	
465/ wclass1209_466.csv	
145/emb1207_MNIST.pkl	Embedding for RBM classifier models 145/230/465 respectively used to obtain the samples.
230/emb1209_v2_231_10_MH_MNIST.pkl	
466/emb1209_466_10_MH_MNIST.pkl	
myQRBM_pretrained_211230_146_x100.py	Illustrative python code for obtaining the samples from the QA.

Folder /TABLE3/

Contains data and code relating to Table 3 in the paper.

Directory/File Name	Description
TABLE3/sampset1209_10	QA timing information for 145 model and 10 reads.
TABLE3/sampset1209_100	QA timing information for 145 model and 100 reads.
TABLE3/sampset1209_1000	QA timing information for 145 model and 1000 reads.
TABLE3/getpickle1209.py	Illustrative python code for reading 'sampset*' files.