Week 5

Master Thesis 2020

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DTU Compute

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Outline

Since last

- Back on track
- More digits for MNIST
- Reading
- Draft for "Previous work"

Outline

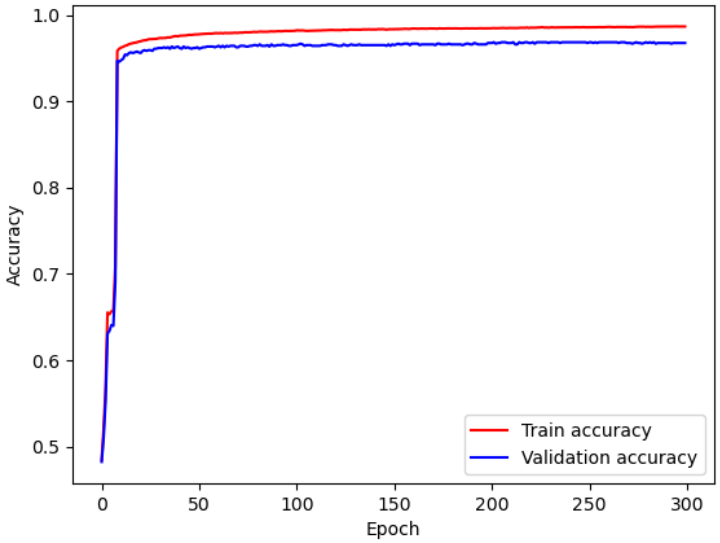
More digits for MNIST

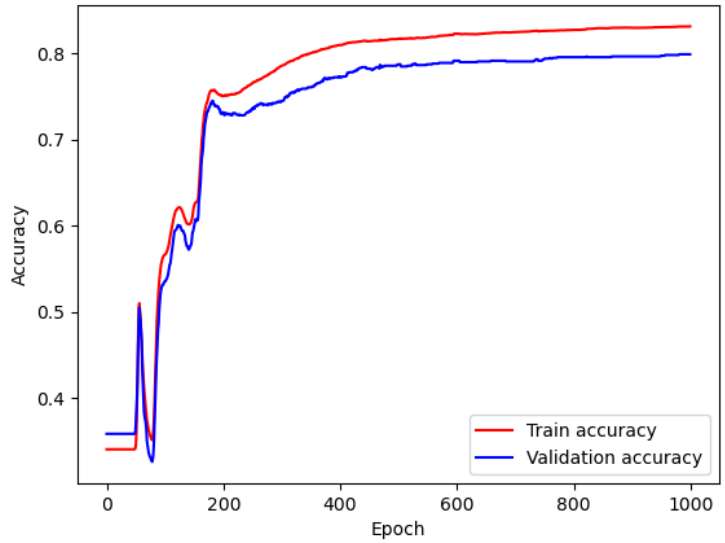
- Does not seem to generalize well
- Has a hard time when digits look alike (4 and 9)

3s, 4s, and 7s

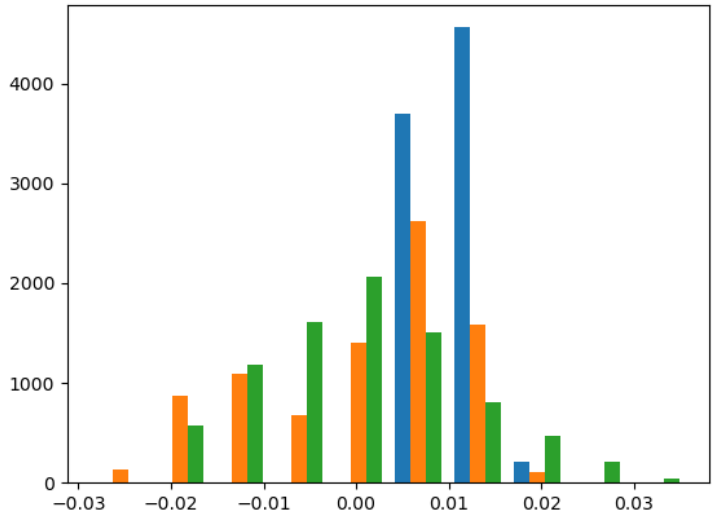
	Full data	**Decomposed**
# inputs	784	3
# hidden neurons	3	5
Total # parameters	3145	33
Testing acc. (%)	≈ 98	≈ 83

3s, 4s, and 7s





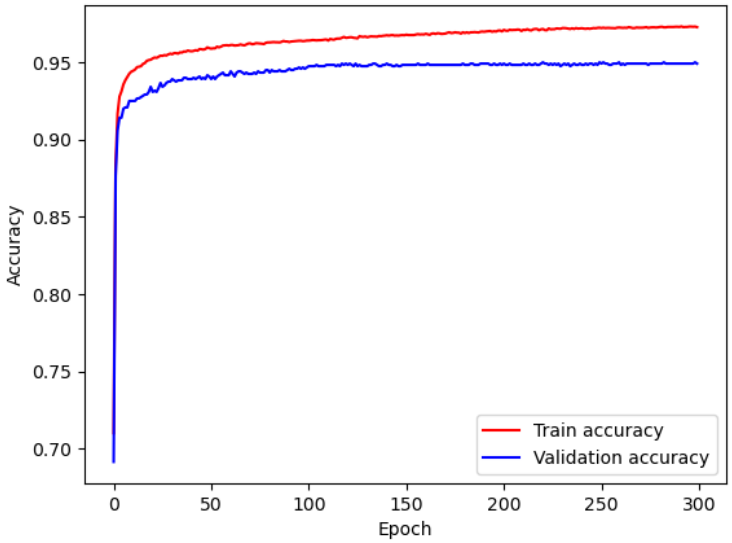
Histogram of loadings of A matrix

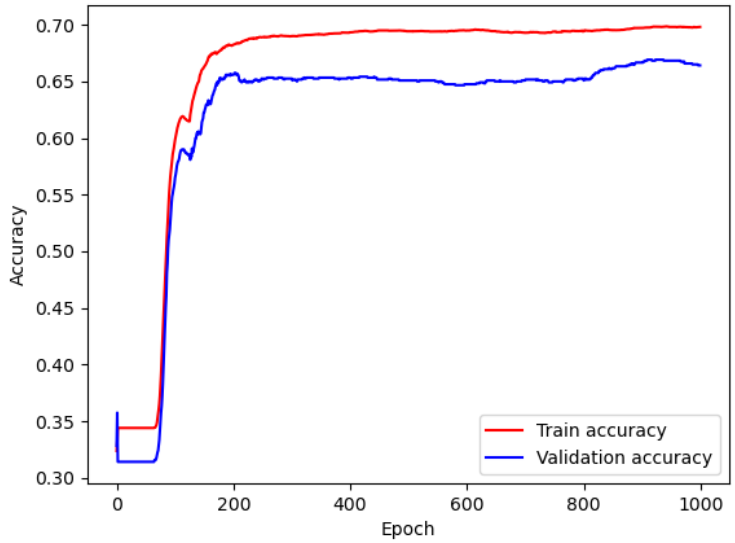


3s, 4s and 9s

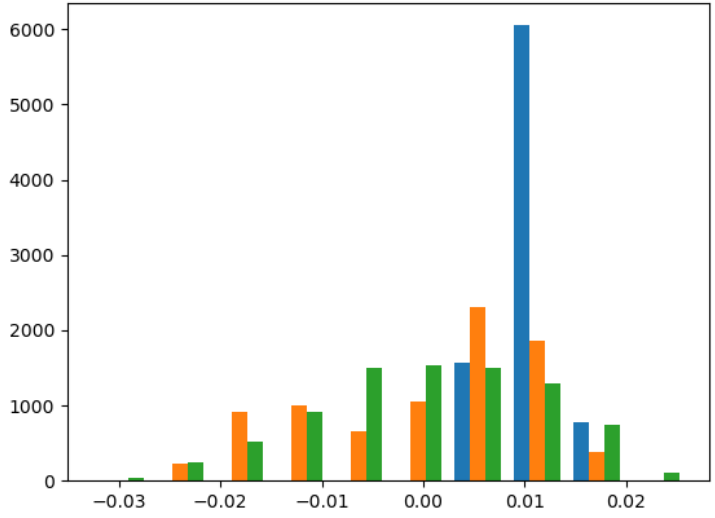
	Full data	**Decomposed**
# inputs	784	3
# hidden neurons	3	5
Total # parameters	3145	33
Testing acc. (%)	≈ 96	≈ 68

3s, 4s and 9s





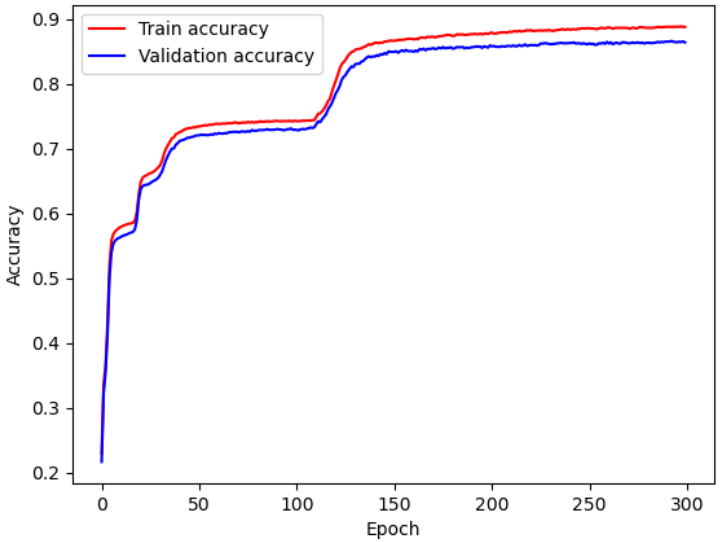
Histogram of loadings of A matrix

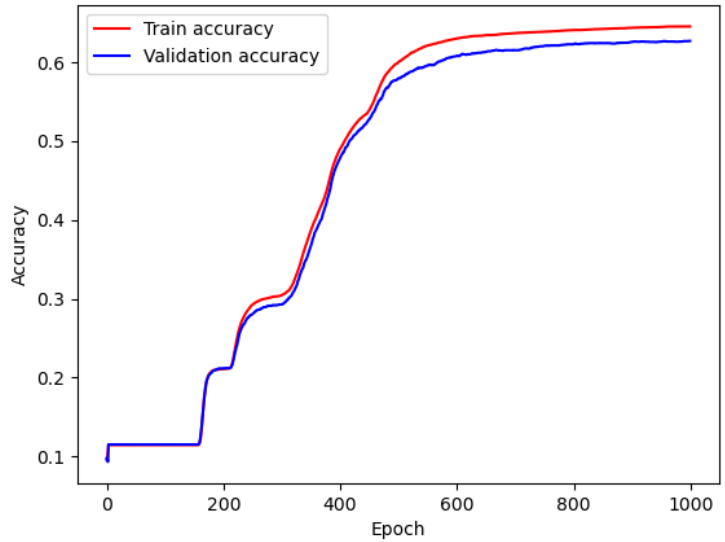


All digits

	Full data	**Decomposed**
# inputs	784	15
# hidden neurons	10	15
Total # parameters	8724	390
Testing acc. (%)	≈ 88	≈ 64

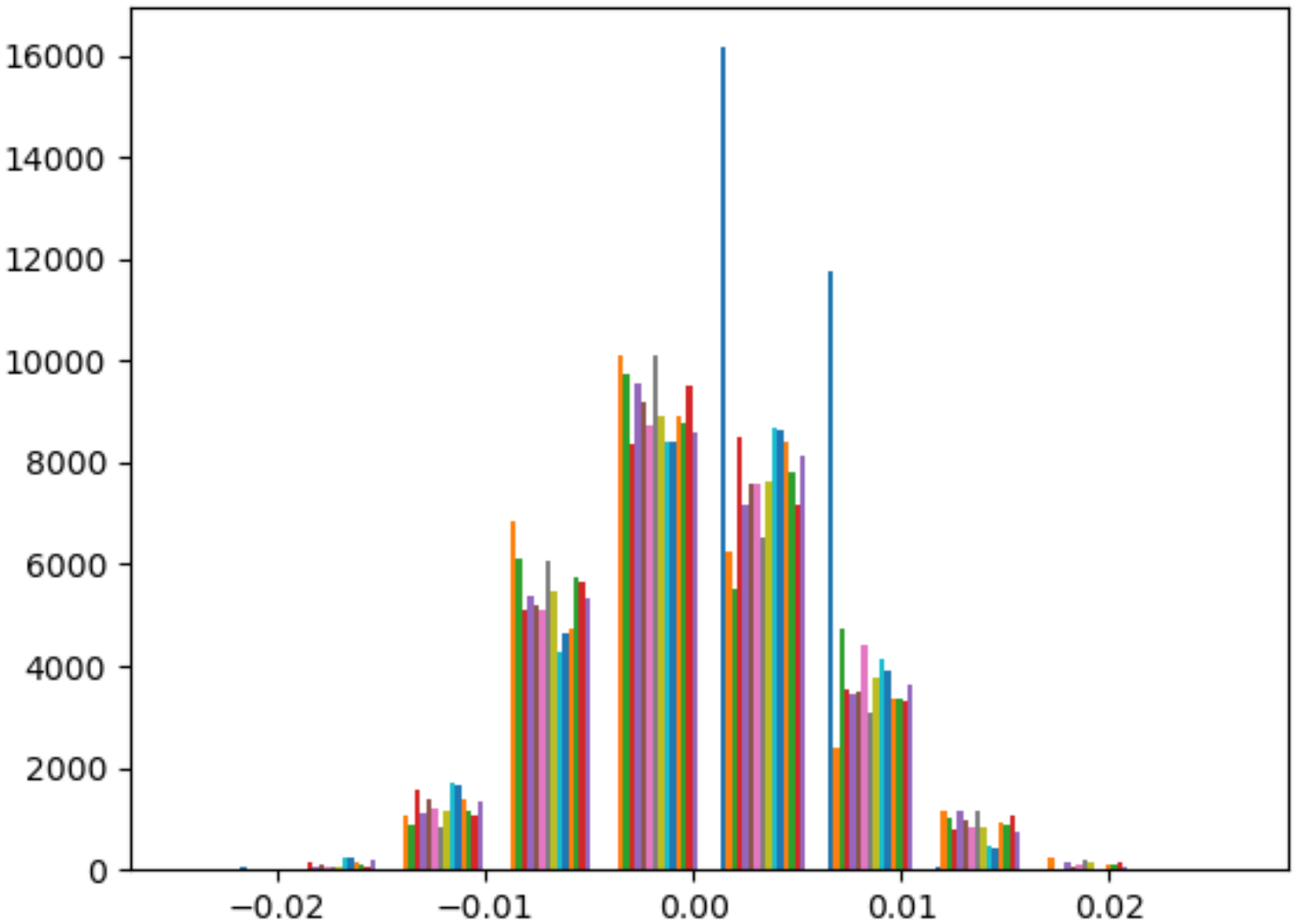
All digits


Train accuracy
Validation accuracy
Accuracy
Epoch
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0
50
100
150
200
250
300


Train accuracy
Validation accuracy
Accuracy
Epoch
0.6
0.5
0.4
0.3
0.2
0.1
0
200
400
600
800
1000

All digits

Histogram of loadings of A matrix



Outline

Previous work

Outline of section:

- Decomposing the dense layer (Nokinov - TT)
- Speeding up the convolution (Jaderberg - selfmade / Lebedev - CP / Wang - BTD)
- The entire network (Kim - Tucker)
- Comparison