

Classification:
MNIST

8	9	0	1	2	3	4	7	8	9	0	1	2	3	4	5	6	7	8	6
4	2	6	4	7	5	5	4	7	8	9	2	9	3	9	3	8	2	0	5
0	1	0	4	2	6	5	3	5	3	8	0	0	3	4	1	5	3	0	8

Regression

NNs with a single Hidden Layer

100 hidden
neurons

+ L2 Regul.

50 hidden
neurons

Human Error?

Around 0%

↕ **Avoidable Bias**

Error on Training Set

2 %

1 %

3 %

1 %

↕ **Variance**

Problem? 100 hidden neurons

*= (28x28 + 1)*100 + (100 + 1) * 10 weights
that have to be learned!*

Error on Dev/Test Set

17 %

14 %

13 %

14 %