Pump Size Classification Revisited

PARISlab Research Project
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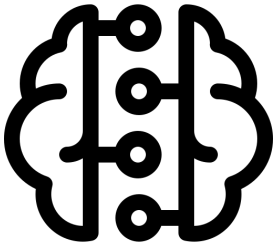
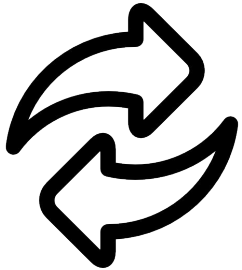
Overview



Neural Network

Field Dataset



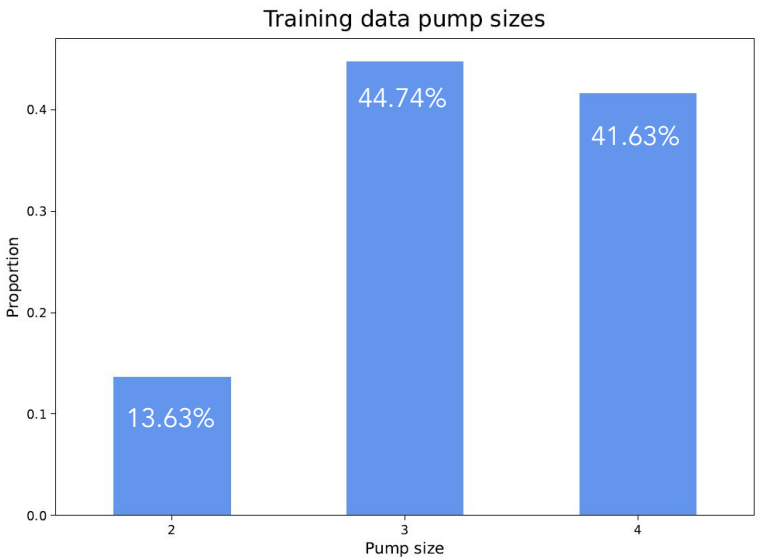
Revisions

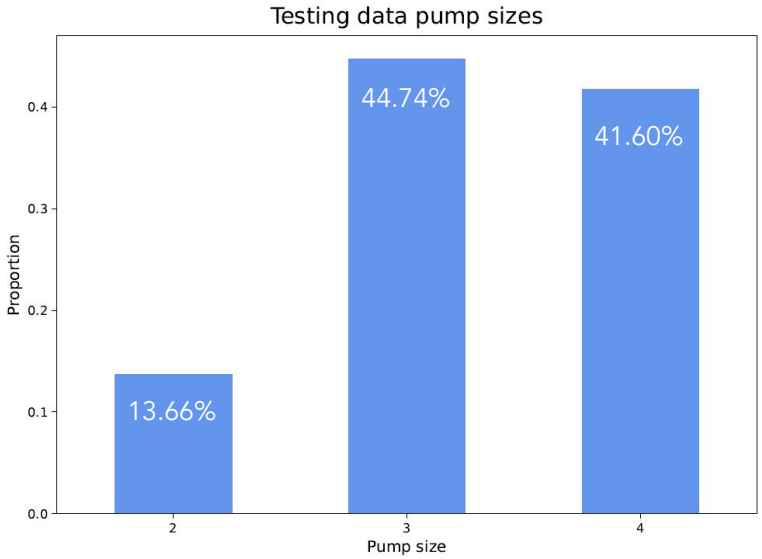
The dataset

	w/cm	cementitious	Coarse agg total	Fine agg total	Coarse agg (>1/2")	Coarse agg (<1/2")	Pump size
0	0.47	602.0	1525.0	1721.88	0.0	1525.0	2
1	0.47	635.0	1250.0	1701.90	0.0	1250.0	2
2	0.40	752.0	1250.0	1565.18	0.0	1250.0	2
3	0.52	611.0	1250.0	1649.95	0.0	1250.0	2
4	0.41	750.0	1050.0	1919.73	0.0	1050.0	2
...	...	...	...	...	...	...	...
5871	0.54	510.0	1700.0	1683.30	1700.0	0.0	4
5872	0.55	500.0	1700.0	1692.29	1700.0	0.0	4
5873	0.55	484.0	1700.0	1740.93	1700.0	0.0	4
5874	0.55	500.0	1675.0	1556.35	1675.0	0.0	4
5875	0.55	486.0	1700.0	1538.18	1700.0	0.0	4

5747 rows × 7 columns

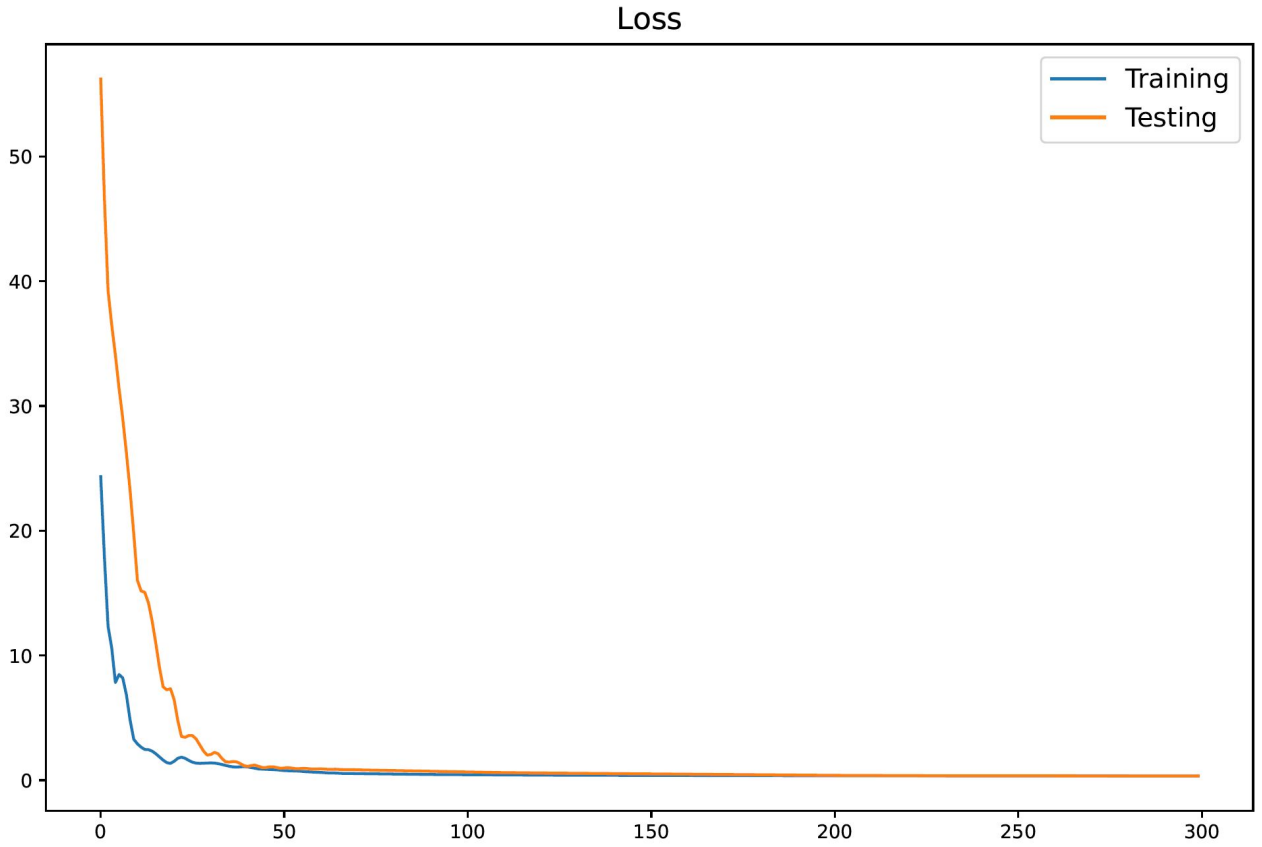
Stratified train-test split (n=5747)

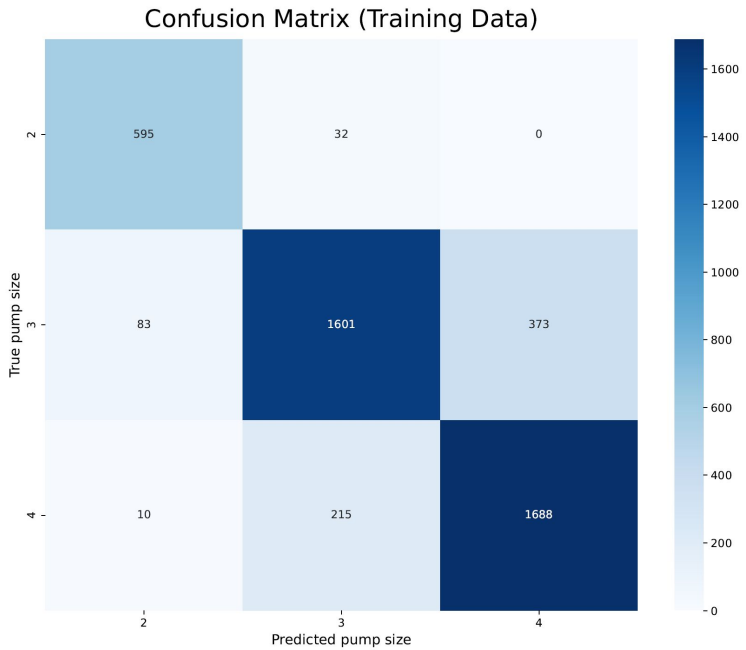




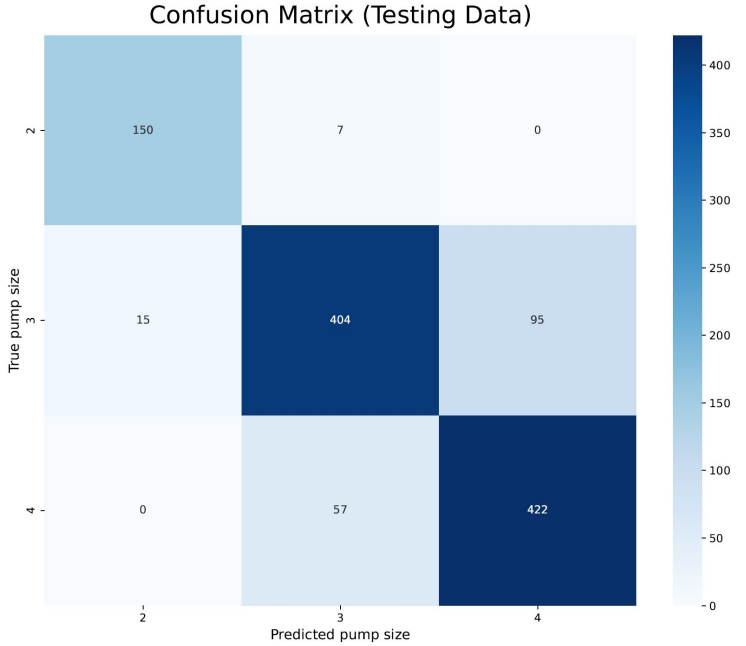
Model details

- 2 hidden layers
  - 16 and 8 neutrons respectively
- CrossEntropyLoss with weighted classes
- ReLU activation function
- Adam optimizer (lr=0.001)
- 300 epochs for training data


Loss
Training
Testing
50
40
30
20
10
0
0
50
100
150
200
250
300



Accuracy: 84.49%



Accuracy: 84.87%

Plans for next week

- Finalize Gaussian Process model
- Expand to GPyTorch