Just an Idea

February 3, 2023

Input Histograms

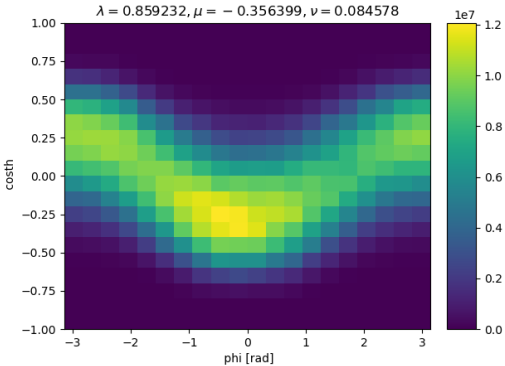

Figure 1: 2D histogram used for training.

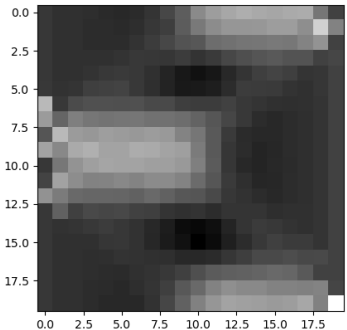

Figure 2: Image of the 2D histogram. This is a conisdered as a 20 x 20 pixel imgage. Each histogram is scaled by the standard scalar.

» 100K histograms were generated randomly with λ, μ, ν (as targets) in range [-1.0, 1.0] and they are split in to test: validate: train = 60: 20: 20.

CNN Architecture

- Feature extraction;
  - 2 convolutional layers.
  - 2 max pooling layers.
  - activated by ReLu activation function.
- Regression layers;
  - 3 linear layers.
  - Activated by ReLu activation function.
- Learning rate = 0.001 and L2 regulation = 1.0e-05.
- DNN was trained for 50 epochs.

Loss Curve

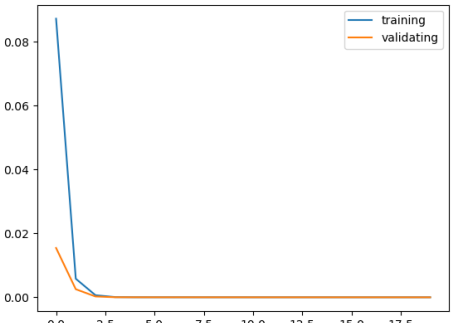

Figure 3: Loss curve.

Testing

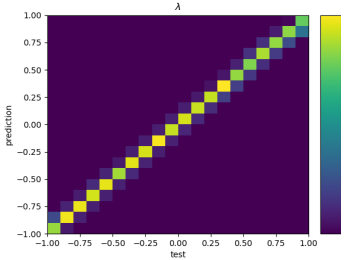

Figure 4: Test λ distribution.

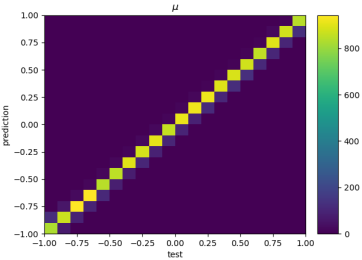

Figure 5: Test μ distribution.

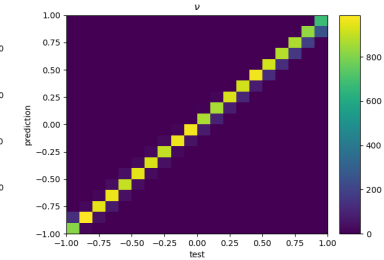

Figure 6: Test ν distribution.

» Results are promising ?

$[\lambda, \mu, \nu] = [0.5, 0.0, 0.0]\sigma = 0.1$

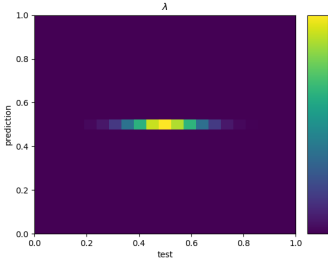

Figure 7: Test λ distribution.

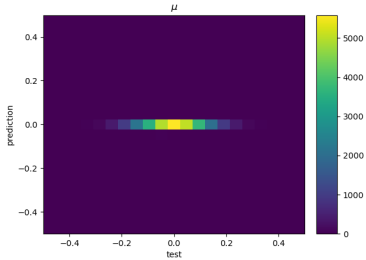

Figure 8: Test μ distribution.

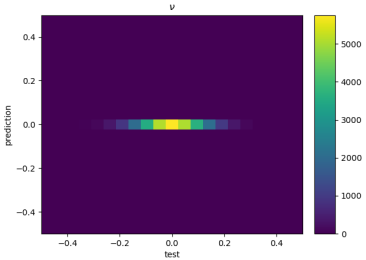

Figure 9: Test ν distribution.

$[\lambda, \mu, \nu] = [0.5, 0.0, 0.0]\sigma = 0.05$

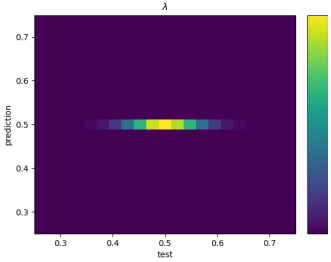

Figure 10: Test λ distribution.

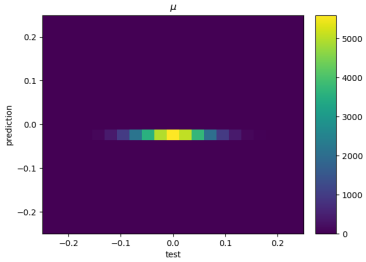

Figure 11: Test μ distribution.

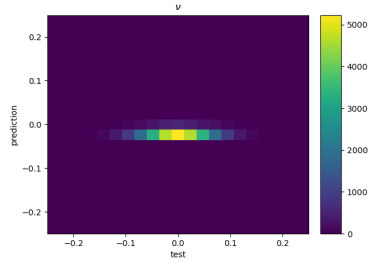

Figure 12: Test ν distribution.

$$[\lambda, \mu, \nu] = [1.0, 0.0, 0.0]\sigma = 0.01$$

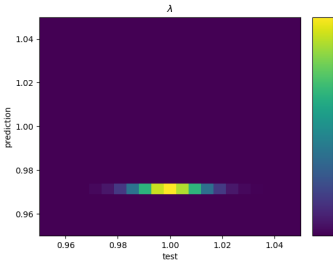

Figure 13: Test λ distribution.

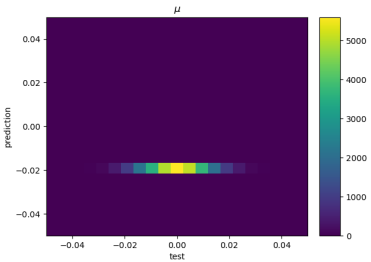

Figure 14: Test μ distribution.

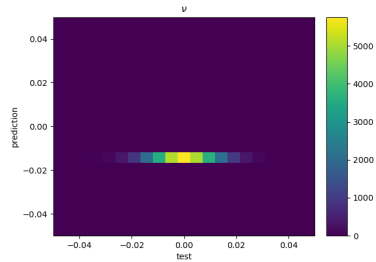

Figure 15: Test ν distribution.

Other

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