

# MNIST dataset:

|                                      |   |      |      |      |      |   |      |      |      |      |
|--------------------------------------|---|------|------|------|------|---|------|------|------|------|
| Training Information                 | Visual verification of input data             |      |      |      |      | N/A, they were paid to make this dataset, I trust it. |      |      |      |      |
|                                      | Training, validation, and testing data splits |      |      |      |      | 60k training images, 10k testing images               |      |      |      |      |
|                                      | Input image size used for testing/training    |      |      |      |      | 28x28 pixels  |      |      |      |      |
|                                      | Image processing                              |      |      |      |      | N/A   |      |      |      |      |
|                                      | Parameters of logistic regression             |      |      |      |      | Number of Epochs - 100000                             |      |      |      |      |
|                                      | Optimizer type and corresponding parameters   |      |      |      |      | Gradient Descent<br>Learning rate of .01              |      |      |      |      |
| Testing Information                  | .97   | 0    | .002 | .004 | 0    | 0   | .008 | .001 | .007 | 0    |
|                                      | 0   | .95  | .01  | .002 | .001 | .001  | .004 | .001 | .03  | 0    |
|                                      | .015  | .088 | .82  | .03  | .02  | .02   | .03  | .02  | .04  | 0    |
|                                      | .004  | .003 | .022 | .87  | 0    | .02   | .007 | .018 | .03  | .01  |
|                                      | .003  | .009 | .005 | .001 | .86  | .001  | .18  | .002 | .18  | .07  |
|                                      | .03   | .02  | .007 | .012 | .13  | .63   | .03  | .01  | .060 | .02  |
|                                      | .005  | .03  | .02  | .001 | .01  | 0   | .88  | 0    | .007 | 0    |
|                                      | .004  | .03  | .026 | .001 | .012 | 0   | .003 | .86  | .01  | .035 |
|                                      | .008  | .012 | .012 | .034 | .01  | .026  | .014 | .013 | .855 | .013 |
|                                      | .015  | .011 | .012 | .014 | .05  | .012  | .001 | .034 | .01  | .84  |
| Training and testing execution times |   |      |      |      |      |   |      |      |      |      |

# C. elegans dataset:

|                      |   |  |  |  |  |  |  |  |  |  |
|----------------------|---|--|--|--|--|--|--|--|--|--|
| Training Information | Visual verification of input data             |  |  |  |  | Looked at all thumbnails and removed problematic entries   |  |  |  |  |
|                      | Training, validation, and testing data splits |  |  |  |  | Randomized order; 15% of worms and non-worms for testing set; 85% of worms and non-worms for training; test data randomized each run |  |  |  |  |
|                      | Input image size used for testing/training    |  |  |  |  | 100p x 100p  |  |  |  |  |
|                      | Image processing                              |  |  |  |  | Python CV2 (images greyscaled)   |  |  |  |  |
|                      | Parameters of logistic regression             |  |  |  |  | Regularization parameter - .01<br>number of epochs - 600000  |  |  |  |  |
|                      | Optimizer type and                            |  |  |  |  | Gradient descent   |  |  |  |  |

|                                      |  |                      |
|--------------------------------------|--|----------------------|
|                                      | corresponding parameters                 | Learning rate - .001 |
| Testing Information                  | .82                                      | .24                  |
|                                      | .18                                      | .76                  |
| Training and testing execution times | Training – ~20hrs<br>Testing – ~1 minute |                      |