**Ultimate Parameter Testing**

**40 Hidden Nodes**

**1 Hour Trials - Unchanging**

Number of Training Images: 6370

Number of Testing Images: 455

**Trial #1** – Alpha of 0.1, Eta of 0.1

First Decrease: 2084-1884 = 200

Half-way Decrease: 1007- 987= 20

Last Decrease: 831-825 = 6

Initial Error: 2084

Final Error: 825

Correct: 316

Incorrect: 49

No Guess: 90

Overall Accuracy: 69.45%

**Trial #2** – Alpha of 0.1, Eta of 0.2

First Decrease: 2043- 1908 = 135

Half-way Decrease: 1195-1164 = 31

Last Decrease: 1026-1031 = -5 – But one before was 1037-1026 = 11

Initial Error: 2043

Final Error: 1031

Correct: 272

Incorrect: 64

No Guess: 119

Overall Accuracy: 59.78%

**Trial #3** – Alpha of 0.1, Eta of 0.05

First Decrease: 2609-1967 = 642

Half-way Decrease: 1090-1074 = 16

Last Decrease: ???

Initial Error: 2609

Final Error: 902

Correct: 281

Incorrect: 68

No Guess: 106

Overall Accuracy: 61.75%

**Trial #4** – Alpha of 0.2, Eta of 0.1

First Decrease: 1961-1749 = 212

Half-way Decrease: 1024-1005 = 19

Last Decrease: 905-885 = 20 – Got a little lucky, I believe

Initial Error: 1961

Final Error: 885

Correct: 301

Incorrect: 66

No Guess: 88

Overall Accuracy: 66.15%

**Trial #5** – Alpha of 0.2, Eta of 0.075

First Decrease: 1975-1798 = 177

Half-way Decrease: 1005- 979 = 26

Last Decrease: 839-827 = 12

Initial Error: 1975

Final Error: 827

Correct: 306

Incorrect: 60

No Guess: 89

Overall Accuracy: 67.25%

**Trial #6** – Alpha of 0.1, Eta of 0.5

First Decrease: 2016- 2023 = -7

Half-way Decrease: 1921- 1906 = 15

Last Decrease: 1907- 1888= 19

Initial Error: 2016

Final Error: 1888

Correct: 67

Incorrect: 79

No Guess: 309

Overall Accuracy: 15.80%

**Trial #7** – Alpha of 0.5, Eta of 0.1

Great progress for 11 iterations, then fluctuated (39 iterations total)

First Decrease: 1861- 1632 = 229

Half-way Decrease: 980- 992= -12

Last Decrease: 898- 903= -5

Initial Error: 1861

Final Error: 903

Correct: 265

Incorrect: 51

No Guess: 108

Overall Accuracy: 62.50%

**Trial #8** – Alpha of 0.15, Eta of 0.1

First Decrease: 2276- 1710= 556

Half-way Decrease: 1921- 1906 = 15

Last Decrease: 1907- 1888= 19

Initial Error: 2016

Final Error: 1888

Correct: 67

Incorrect: 79

No Guess: 309

Overall Accuracy: 15.80%

**1 Hour Trials – Fluid Changing**

**Trial #1** – Starting alpha of 0.9, Constant Eta of 0.1

Function (Where og is the original – 0.9):

def alpha\_changer(x, og):

x -= x\*\*0.046 - og

return(x)

Accuracy: 64.39%

**Trial #2** – Starting alpha of 0.5, Constant Eta of 0.1

def alpha\_changer(x, og):

x -= x\*0.04

return(x)

Accuracy: 63.07%

**Trial #3** – Starting alpha of 0.8, Constant Eta of 0.1

def alpha\_changer(x, og):

x -= x\*0.055

return(x)

Accuracy: 53.38%

**Trial #4** – Starting alpha of 0.4, Constant Eta of 0.1

def alpha\_changer(x, og):

x -= x\*0.03

return(x)

Accuracy: 63.73%

The two above A: 0.1 / E: 0.1 and another A: 0.2 / E: 0.1… are still doing better??? Investigate