

# ANN ElbowGraphing

## Importing Data

```
In[19]:= SetDirectory[NotebookDirectory[]]
Out[19]= /home/ff278/Desktop/Previous_Lutein/Current/Lutein_Experiment

In[20]:= (*1 Layer*)
importH1 = Import["elbow_rule/nHidden_test_New.csv", "CSV"][[2 ;;]] [[All, 2 ;;]]
Out[20]= {{5, 15, 0.182865}, {5, 50, 0.0961221}, {5, 100, 0.0722193}, {5, 200, 0.0632884},
{5, 300, 0.0770888}, {5, 400, 0.0577356}, {5, 600, 0.0594264}, {10, 15, 0.150862},
{10, 50, 0.0911187}, {10, 100, 0.0885913}, {10, 200, 0.071043},
{10, 300, 0.0706477}, {10, 400, 0.0651185}, {10, 600, 0.0542664},
{15, 15, 0.180479}, {15, 50, 0.135631}, {15, 100, 0.0852097}, {15, 200, 0.0600364},
{15, 300, 0.0723336}, {15, 400, 0.0648816}, {15, 600, 0.0497187},
{20, 15, 0.2005}, {20, 50, 0.117507}, {20, 100, 0.0887219}, {20, 200, 0.0636221},
{20, 300, 0.0574849}, {20, 400, 0.0506655}, {20, 600, 0.0530097},
{30, 15, 0.19752}, {30, 50, 0.107826}, {30, 100, 0.0919606}, {30, 200, 0.0547238},
{30, 300, 0.0645101}, {30, 400, 0.0573211}, {30, 600, 0.0400664},
{50, 15, 0.207627}, {50, 50, 0.132981}, {50, 100, 0.0908348}, {50, 200, 0.0595211},
{50, 300, 0.051638}, {50, 400, 0.0510636}, {50, 600, 0.0530125}}

In[21]:= (*Struc 1*)
Struc1H1 = importH1;
(*Struc2H1=
Table[{importH1[[i, 1]], importH1[[i, 2]], importH1[[i, 4]]}, {i, Length[importH1]}];*)

In[22]:= (*Struc 2*)
(*2 Layers*)
importH2 = Import["elbow_rule/nHidden_test_New2.csv", "CSV"][[2 ;;]] [[All, 2 ;;]];

In[23]:= Struc1H2 = importH2;
(*Struc 1*)
(*Struc 2*)

In[24]:=
```

```
In[25]:= Struc1H1
```

```
Out[25]= {{5, 15, 0.182865}, {5, 50, 0.0961221}, {5, 100, 0.0722193}, {5, 200, 0.0632884},
          {5, 300, 0.0770888}, {5, 400, 0.0577356}, {5, 600, 0.0594264}, {10, 15, 0.150862},
          {10, 50, 0.0911187}, {10, 100, 0.0885913}, {10, 200, 0.071043},
          {10, 300, 0.0706477}, {10, 400, 0.0651185}, {10, 600, 0.0542664},
          {15, 15, 0.180479}, {15, 50, 0.135631}, {15, 100, 0.0852097}, {15, 200, 0.0600364},
          {15, 300, 0.0723336}, {15, 400, 0.0648816}, {15, 600, 0.0497187},
          {20, 15, 0.2005}, {20, 50, 0.117507}, {20, 100, 0.0887219}, {20, 200, 0.0636221},
          {20, 300, 0.0574849}, {20, 400, 0.0506655}, {20, 600, 0.0530097},
          {30, 15, 0.19752}, {30, 50, 0.107826}, {30, 100, 0.0919606}, {30, 200, 0.0547238},
          {30, 300, 0.0645101}, {30, 400, 0.0573211}, {30, 600, 0.0400664},
          {50, 15, 0.207627}, {50, 50, 0.132981}, {50, 100, 0.0908348}, {50, 200, 0.0595211},
          {50, 300, 0.051638}, {50, 400, 0.0510636}, {50, 600, 0.0530125}}
```

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## 3d Contour Plotting

```
In[316]:= customLab = {Bold, 14, Black}
labelsTag = {"Neurons Hidden Layer", "Training Epochs", "Error"}
labelvec =
  {Graphics3D[Text[Style[Rotate[labelsTag[[2]], -30 Degree], Bold, Medium], Scaled[
    {1.2, .6, 0.15}]]], Graphics3D[Text[Style[Rotate[labelsTag[[1]], 45 Degree]
    , Bold], Scaled[{.6, 1.15, 0.15}]]], Graphics3D[
    Text[Style[Rotate[labelsTag[[3]], 90 Degree], Bold], Scaled[{1.2, .05, 0.8}]]]};
vPoint =
  {2,
   1.5,
   1.5}
```

```
Out[316]= {Bold, 14, ■}
```

```
Out[317]= {Neurons Hidden Layer, Training Epochs, Error}
```

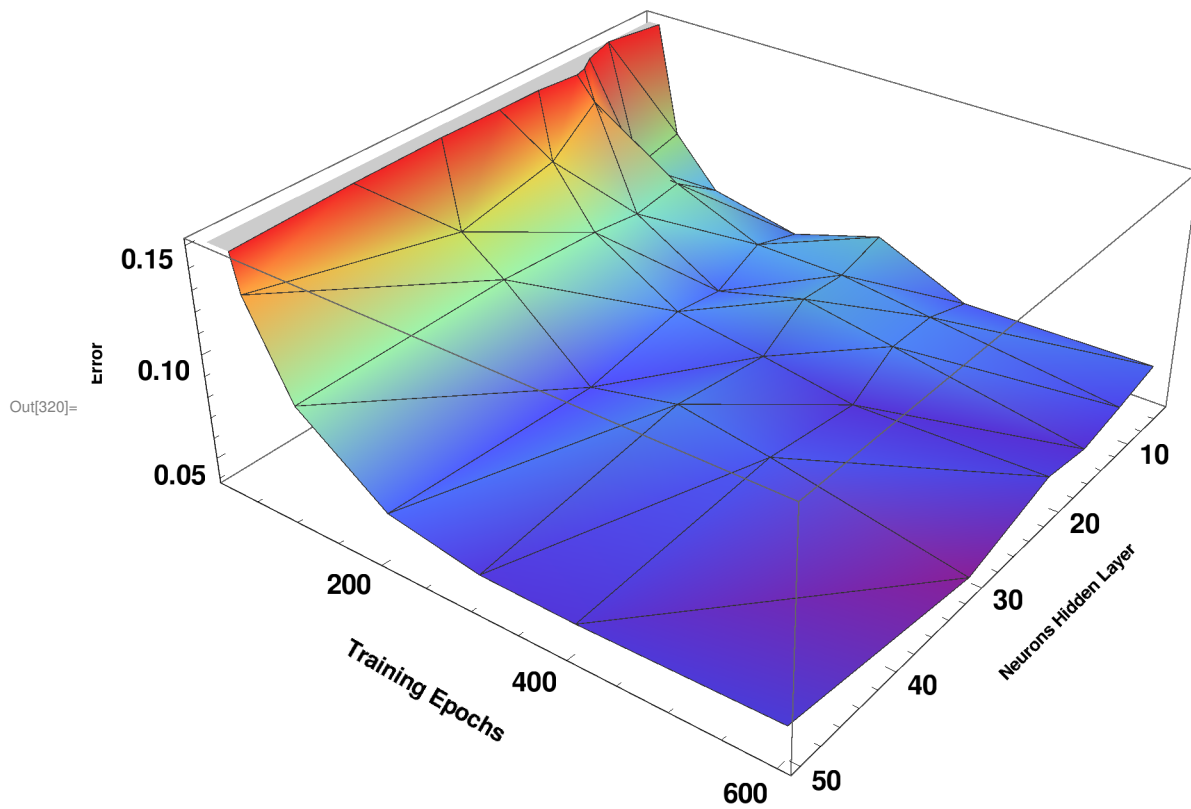
```
Out[319]= {2, 1.5, 1.5}
```

```
In[29]:= (*1 Layer*)
```

```

In[320]:= Show[ListPlot3D[Struc1H1, Mesh → All,
  InterpolationOrder → 1, ColorFunction -> "Rainbow", ViewPoint → vPoint,
  ImageSize → Large, LabelStyle → customLab], labelvec]

```



```

In[31]:=

```

```

In[32]:= (*2 Layers*)

```

```
In[321]:= Show[ListPlot3D[Struc1H2, Mesh → All,  
  InterpolationOrder → 1, ColorFunction -> "Rainbow", ViewPoint → vPoint,  
  ImageSize → Large, LabelStyle → customLab], labelvec]
```

