**SHEET DETAILS:**

**COLUMNS:**

* Frame Length – Window of analysis.
* Frame Shift – Shift of one frame to another
* No. of MFCC – no. of MFCC features from each Frame
* Hidden Nodes – No. of nodes in the hidden layer
* MSRE Train – Error at the end of training on training set
* MSRE Val – Error on validation Test
* MSRE Test – Error on Test set
* Time Feature Calc – Time taken in extracting feature of all sample set
* Time Training – Time taken in training the neural network
* Percent Error – Percent of sample cases not matched to target output (on all samples) divided by 100.
* Performance – cross entropy error. More weightage to the error in samples whose target didn’t match output.

**Variable Parameters – Possible reason for variance in error**

**In Sheet FilterBank1323**

Changing parameter filter bank channels. Data – (FL\_Sl)

**In Sheet Hidden\_Node:**

With 300 samples the error is increasing as we increase the hidden node, but this well very may be due to the increasing number of parameters that has to be determined.

Same with full sample instead of 300 – (HN\_NL\_Sl)

**For FinalSheet(1123-5123)**

**In Sheet FrameLength123**

Testing that the monotonic decrease in error might be due to decrease in the input features which would imply that providing larger data set might give us some conclusion

DL\_FL2 – 300 samples

DL\_FL\_Sl – Full Sample

DL\_FL\_SL\_223 – j=2, k=2, l=3

DL\_FL\_SL\_323

**In Sheet Compile4Old**

Min\_grad = 1e-6; goal = 0; max\_fail = 6; lr = 0.0001

Part A - Random initialization, fixed Indices, 300 samples

All data – DL\_FL

Part B – Random Initialization, random indices, 300 samples

All data – NL\_FL

**In Sheet Complie2**

This one has 10 values for each one. All of below analysis was done for **FinalSheet1123**.

The condition of repeat if validation check was reason for stopping has been removed in this. The name in brackets contain the name of table.

Min\_grad = 1e-6; goal = 0; max\_fail = 6; lr = 0.0001

SHEET4 has 50 data for Nl and CEl

* Nothing – (Nl) – Random indices, random initialization 300 samples each
* Distribution in data of different groups - Fix it (Dl)
* Initialization of weights – Fix it (Wl)
* Sample size – Run on Total Data – Fix it (Sl)
* Sample size with fixed distribution of data – (Sl\_Dl)
* Data with seed fixed in weight initialization, random index – (OldData)
* Data with seed fixed in weight initialization, random index – (OD\_Dl)
* Cross Entropy as error function, regularization = 0.1, no normalization – (CEl)

**Conclusion**

* Increasing sample size definitely decreases the average mean square error
* No idea

**In Sheet Complie3**

This one has 10 values for each one. All of below analysis was done for **FinalSheet1125.**

Min\_grad = 1e-6; goal = 0; max\_fail = 6; lr = 0.0001

* Nothing – (Nl1125l) – Random indices, random initialization 300 samples each
* Distribution in data of different groups - Fix it (Dl1125l)
* Initialization of weights – Fix it (Wl1125l)
* Sample size – Run on Total Data – Fix it (Sl1125)
* Sample size with fixed distribution of data – (Sl\_Dl1125)
* Data with seed fixed in weight initialization, random index – (OldData1125)
* Data with seed fixed in weight initialization, random index – (OD\_Dl1125)

**In Sheet Compile**

Min\_grad = 1e-6; goal = 0.001; max\_fail = 6; lr = 0.0001

* Nothing – (N) – Random indices, random initialization 300 samples each
* Distribution in data of different groups - Fix it (D)
* Initialization of weights – Fix it (W)
* Sample size – Run on Total Data – Fix it (S)
  + The condition of repeat if validation check was reason for stopping has been removed in this.

**Possible Steps Taken**

* Repeat whole process if training stops because of validation checks (VC)
* Repeat whole process if validation error is below some acceptance level (VE)
* Repeat whole process if gradient is not met.

## **ERROR REVIEW IN COLLECTED DATA**

It seems that in all cases the second class had not be categorized at all. They had been given output of 1st class where they should have been second class. (Both in case of FinalSheet1125 and FinalSheet1123)

* FinalSeet1125 – None of the sound example of second class fell in right class.
  + Previous data as in FinalSheetMerged, reproduced. Seed fixed. - (OldData)
  + Random Indices, Random Initialization, no seed, Full sample – (N1125l)

**NOTE**

* Add one parameter as time taken in doing whole process for an unknown sample.

**EXTRA NOTE**

<http://www.math.ntu.edu.tw/~mathlib/preprint/2011-03.pdf> -

<http://yann.lecun.com/exdb/publis/pdf/lecun-98b.pdf>

* Cross entropy as error function
* Reducing sample size to 300 samples

**ANDROID**

**In sheet ANDROID:**

Time take by android in extracting feature for sound sample of 0.5sec in ANDROID500

* App was crasing when frame length was set to 350 with error java.lang.ArrayIndexOutOfBoundsException: length=0; index=0 at in.iitd.assistech.smartband.MFCCMatlab.calcFeatSound(MFCCMatlab.java:196). So not explored after 300.

**Note:**

* **When length of sound to be analysed at a time is made 1 sec the time is increasing each new process. At 500ms it is working fine.**

# **Conclusions**

* Even after changing the dataset and loading a sample dataset from matlab had no effect on variance, so it is not because of data.