

Figure 10 Multilayer Feed Forward Network

The neural network uses is Back Propagation Feed Forward Neural Network who’s input is the characters extracted by the extraction process, the system is trained for multiple shapes of characters for a learning rate of .005 and the number of trials were found to be 1500 this sets up the neural network to perform at its peak value that is 88% in recognition. This system used multiple values tested upon and then final value at which each character was recognized by the system effectively was proposed.

IV.EXPERIMENTAL RESULTS

The trained and designed neural network has an efficiency of about 80% and it recognized the characters of the test image very perfectly and the system worked efficiently. The cost function graph is shown in the Fig.[8]. The system was implemented for about 3 vehicles parked inside the premises of Iqra University and had a very good performance ration in terms of recognition and segmentation from the image as shown in Table[1].

Successful Extraction	Character	98%
Successful recognition		99%
Overall Success		98%

Table.1 Performance Report

The experimental results also show that the system recognized the characters from the images very clearly and the detection process was faster and reliability process is shown in the mentioned table.

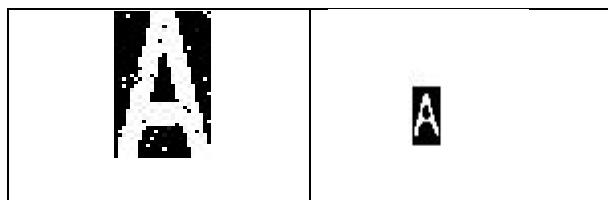


Table.2 Performance analyzing of Received and decided Character

The above table shows the recognized character which is compared with the character that was used to train the neural network system.

v. The Cost Function

Cost function is defined as the error performance of the ratio of the weights updated and the performance behavior of the neural system and the cost function is ideally is a decay function with time when the weights update and the decision are more precise and accurate then in this system the weights were decaying factor which depicts that the as the training session value is increased the weights are more updated and the values are decreased which shows that the system is now self reliable and self sufficient to make decisions in real time Fig.[11]

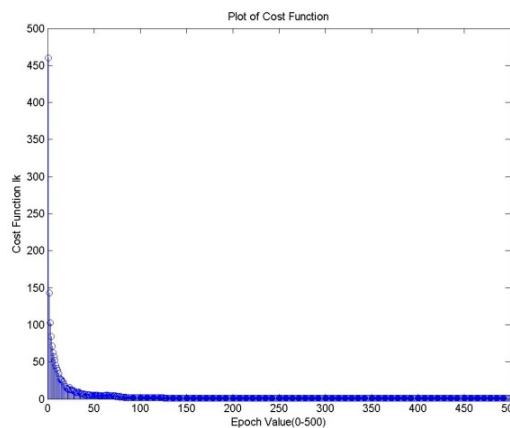


Figure 11 Cost Function graph

ACKNOWLEDGMENTS

The authors would like to thank ALMIGHTY ALLAH for his blessings and giving opportunity for serving the university and for the country, Also would like to thank the parents for their support and patience and for *Dr. Muhammad Moinuddin* for his complete guidance throughout the procedure and making of this system. Also the authors would like to thank the administration of Iqra University for their huge support in completion of the project and the research work for Pakistani license plate recognition system. Authors would like to thank *Dr. Kamran Raza* for his permission to carry out the research and would like to thank *Sajjad Hussain Zaidi* and *Jawwad Ahmed* for their technical assistance and guidance throughout the process.

REFERENCES

[1] Simon Haykin, "A comprehensive Neural Network" 2nd edition.

[2] Mohamed Deriche and Muhammad Moinuddin, developed *A Neural Networks based Saudi Arabian License Plate Recognition System* Electrical Engineering Department, King Fahd University of, Petroleum & Minerals.

[3] D.G.Bailey, D.Irecki, B.K.Lim and L.Ying, "Test bed for number plate recognition applications", *Proceedings of First IEEE international workshop on Electronic design, test and applications (Delta02)*, IEEE Computer Society., 2002.

[4] J.Barosso, E.L.Dagless, A.Rafael and J.Bulas-Cruz, "Number Plate recognition using computer vision.", *Proceedings of IEEE international Symposium on Industrial Electronics*, vol 3, pp761-767, 1997.

[5] Iqra University established in 2000 in Karachi, Sindh, Pakistan. *One of the Major Universities for graduate studies with most valuable and perfect faculty of engineering and sciences.*

[6] Zidouri and Sarfaraz, "An Automated Saudia Arabian Number Plate Recognition System", *International Conference on systems, International conference on Geometric Modeling and Graphics*, 16-18 July 2003, pp.36-41, 2003.

[7] S.Chang, L.S Chang, Y.C Chang and S.W Chang, "Automated License Plate Recognition", *IEEE Transactions on Intelligent Transportation Systems*, vol, 5, pp.42-53, March 2004

Telecommunication Department, his contact detail mail: [dr.moin@iqra.edu.pk]



Waseem Taj has done Bachelors in Telecommunication from Iqra University Karachi he is currently associated with Saint Micheal's Convent school Karachi, his contact detail [email: coldfire_waseem@hotmail.com]

Farwa Jaffri has also done Bachelors in Telecommunication from Iqra University and currently associated nowhere, Her work in this system is to design the drafting.

Summiya Tasneem has done successfully bachelors in telecommunication from Iqra University and currently associated with different associations as a visiting faculty for intermediate studies.



Syed Fahad Ali (3-3-1991 till date) has done B.E (Telecommunication) from Iqra University and is now associated with different universities as a visiting faculty member and currently pursuing his MS(Comm.) from NUST university. His area of interest are Image processing and RF communication, his contact details are [email id: enr.fahad01@gmail.com]



Dr.Moinuddin is the supervisor of the complete system and he is currently affiliated with Iqra University as Associate Professor