EECE 571 Course Project: Modulation Classification Using Neural Networks

Akshay Viswakumar (Student# 32971665),
Department of Electrical & Computer Engineering,
The University of Birtish Columbia

Abstract

The abstract goes here.

Index Terms

IEEE, IEEEtran, journal, LaTeX, paper, template.

I. Introduction

THIS demo file is intended [1] [2] [3] [4] [5] to serve as a "starter file" for IEEE journal papers produced under LaTeX using IEEEtran.cls version 1.8b and later. I wish you the best of success.

mds
August 26, 2015

A. Subsection Heading Here

Subsection text here.

1) Subsubsection Heading Here: Subsubsection text here.

II. Theory

A. Artificial Neural Networks (ANN)

B. Convolutional Neural Networks (CNN)

CNNs were inspired largely by the way neurons in the visual cortex of the brain responded to visual stimulus. In particular, early research by a pair of neurophysiologists [6] uncovered that visual processing in the mammalian brain always commenced with the detection of simple structures such as oriented edges. Fukushima took inspiration from this notion of hierarchical processing and proposed the Neocognitron [7], a multilayer neural network that could perform pattern recognition through hierarchical feature extraction. The Neocognitron was, for all intents and purposes, the precursor to modern CNNs.

III. Dataset

IV. Conclusion

Acknowledgment

References

[1] T. O'Shea and N. West, "Radio machine learning dataset generation with gnu radio," *Proceedings of the GNU Radio Conference*, vol. 1, no. 1, 2016. [Online]. Available: https://pubs.gnuradio.org/index.php/grcon/article/view/11

[2] S. H. Lee, K.-Y. Kim, and Y. Shin, "Effective feature selection method for deep learning-based automatic modulation classification scheme using higher-order statistics," *Applied Sciences*, vol. 10, no. 2, p. 588, Jan 2020. [Online]. Available: http://dx.doi.org/10.3390/app10020588

[3] B. Kim, J. Kim, H. Chae, D. Yoon, and J. W. Choi, "Deep neural network-based automatic modulation classification technique," in *2016 International Conference on Information and Communication Technology Convergence (ICTC)*, 2016, pp. 579–582.

[4] S. Ramjee, S. Ju, D. Yang, X. Liu, A. E. Gamal, and Y. C. Eldar, "Fast deep learning for automatic modulation classification," 2019.

[5] T. J. O'Shea, J. Corgan, and T. C. Clancy, "Convolutional radio modulation recognition networks," 2016.

[6] D. H. HUBEL and T. N. WIESEL, "Receptive fields of single neurones in the cat's striate cortex," *The Journal of physiology*, vol. 148, no. 3, pp. 574–591, Oct 1959, 14403679[pmid]. [Online]. Available: https://pubmed.ncbi.nlm.nih.gov/14403679

[7] K. Fukushima, "Neocognitron: A self-organizing neural network model for a mechanism of pattern recognition unaffected by shift in position," *Biological Cybernetics*, vol. 36, no. 4, pp. 193–202, 1980. [Online]. Available: https://doi.org/10.1007/BF00344251