BLIND SIGNAL DETECTION

A THESIS

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THESIS CERTIFICATE

This is to certify that the thesis titled **BLIND SIGNAL DETECTION**, submitted by **ALUWALA SAI HARSHITA**, to the Indian Institute of Technology, Madras, for the award of the degree of **MASTER OF TECHNOLOGY AND BACHELOR OF TECHNOLOGY IN ELECTRICAL ENGINEERING**, is a bona fide record of the research work done by her under my supervision. The contents of this thesis, in full or in parts, have not been submitted to any other Institute or University for the award of any degree or diploma.

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ABSTRACT

KEYWORDS: Blind Signal Detection, Automatic Modulation Classification, Cyclostationarity, LSTM Networks

This thesis considers the design of some aspects in the blind signal detection chain - 1) Automatic Modulation Classification : Trained and tested an SVM based classification model with cumulants of the signal as features to classify modulation, 2) Frequency offset and timing estimation : Used cyclostationarity to formulate an optimisation problem and estimated frequency offset and timing information and 3) ViterbiNet : Trained and tested an LSTM + Gaussian mixture model network for calculating transition metrics in Viterbi in presence of uncertainities. Results for each of these are presented in this thesis.

Contact for full report:

The complete project report is available with Professor Devendra Jalihal, EE Department, IITM.