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Musical Instrument Classification Using a Hybrid Neural Network

1. Abstract (Completed, may need editing)
2. Introduction
   1. Why use Neural Networks
   2. Basic Functions – Features, Layers, Optimization
      1. Computational graph representation
      2. Layer types/ activations used.
3. The Neural network
   1. Input and Output
      1. Inputs are features
      2. Outputs are predictions
   2. The features used (extracted from each file)
      1. Spectrogram (Image w/ 1 channel)
      2. Feature Vector (1 x 20) array
      3. Gives rise to a network w/ two input nodes!
4. Features and The Multimodal Model
   1. We develop the following features
      1. Spectrogram shows success
      2. Feature vector shows success
   2. We use two inputs
      1. Spectrogram & feature vector.
      2. Computational graph representation?
   3. Aggregating Results, Ensemble methods?
      1. Show Improve performance?
5. Experimental Classification Results
   1. Using K-Folds X-Validation
      1. Bagging Method?
   2. Report of Metrics
      1. Loss, Accuracy, Precision, Recall scores
      2. Metrics over a period of training
      3. Metrics on Validation set
   3. Final Classifications
      1. Compare Features/ Spectrogram
      2. Compare a few unlabeled examples
6. Conclusion?
   1. Effectiveness of multi modal network?
   2. Comparison to JUST spectrogram of JUST feature vector.