GRAPH SCATTERING CONVOLUTIONAL NETWORK

WCAI/EARTH NETWORKS CHECK-IN 3

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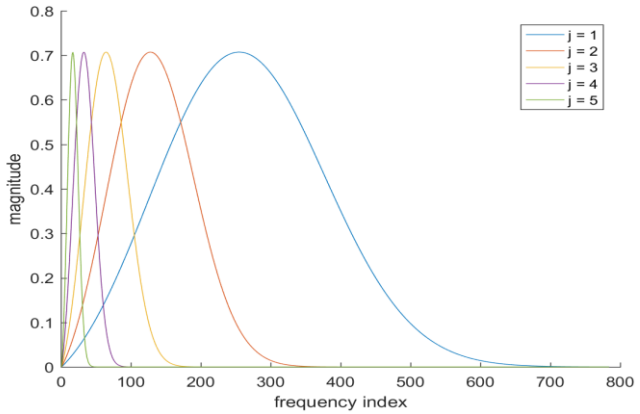
Best results so far

	Missed detection rate	False alarm rate	Average error rate
Pressure	**0.0000**	**0.0501**	**0.0250**
Pressure, Temperature, Wind Speed	0.0690	0.3203	0.1946
Pressure	0.0000	0.055755	0.0279
PCA w/o SCN	**0.0000**	**0.0388**	**0.0139**

- Two layers
- Filter bank of 5 Morlet wavelets
  - $j = 1,2, \ldots, 5$
- From the NY weather dataset
  - 5206 training samples
  - 571 testing samples



Morlet wavelet family

Progress since last check-in

Debugged and Tested implementation with multiple fields

- The results were not satisfactory
- Using multiple fields reduces classification accuracy
  - Pressure continues to be the best predictor of outage

Compared results with and without transforming the data

- Compared against classification using PCA
- PCA performed slightly better than our classifier (96.22% vs 96.11% accuracy)
  - Reminder: so far the architecture of the network was decided a priori not learnt

The Scattering Transform architecture is fixed → It is not learned from data

Graph Neural Networks

- Adapt architecture to data → Train parameters using dataset
- Recent developments on Graph Neural Networks (GNN)
- Exploit underlying geographical proximity information

Goals

- Train dataset to find optimal architecture parameters
- Test different GNN architectures on data
- Keep testing different sensor measurements