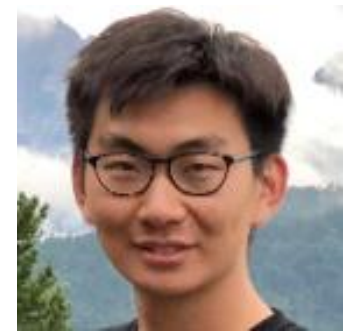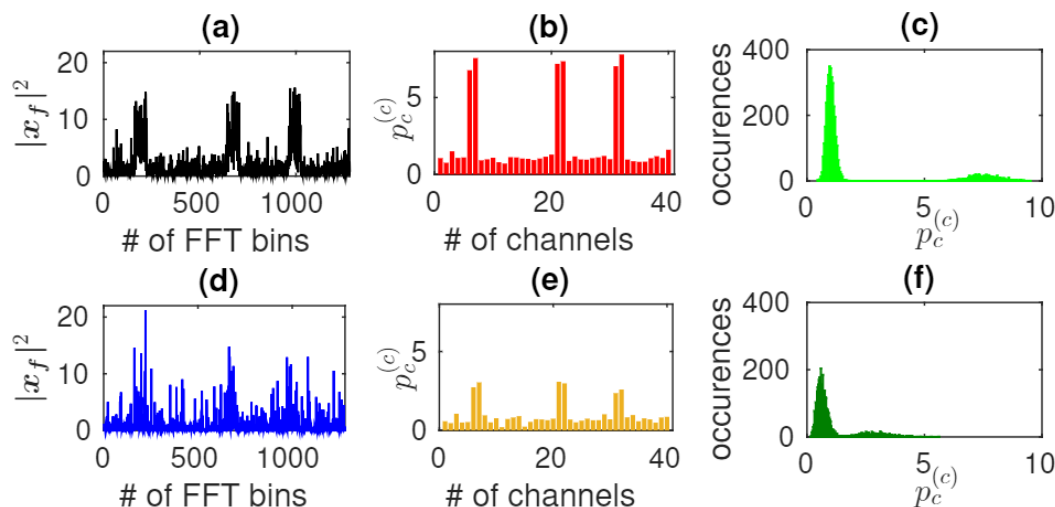# Channel energy statistics learning in compressive spectrum sensing

Haoran Qi

- Channel energy statistics and optimal threshold not only depend on noise energy in compressive spectrum sensing (CSS) but also parameters of sparse recovery algorithm

- A statistical model of channel energy in CSS proposed and validated

- A practical threshold adaption scheme proposed

Channel statistics modelling and threshold adaption

- Mixture Model of two chi-squared distributions – vacant/occupied channels

- Expectation-Maximization method to estimate parameters of the Mixture Model

- A practical Maximum-Likelihood-Estimation-based threshold adaption to find the optimal threshold for energy detection
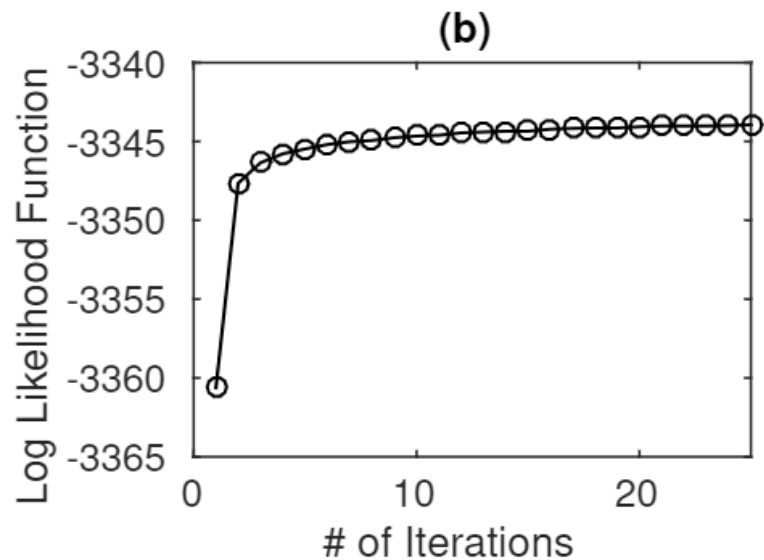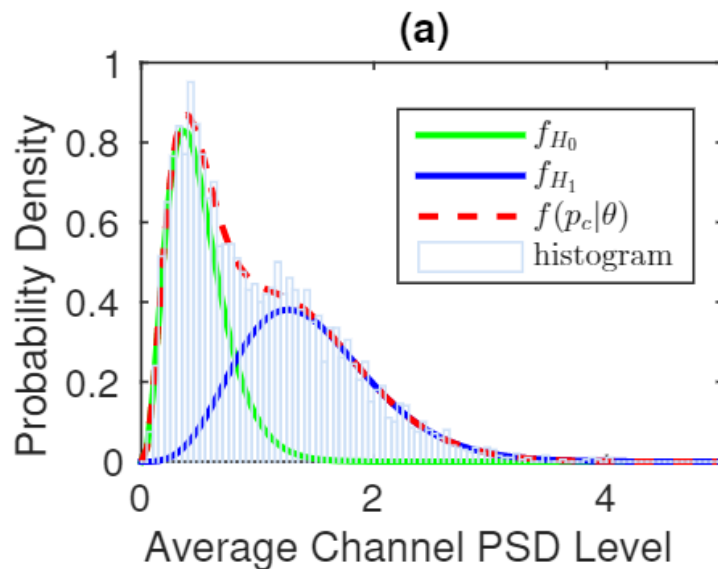
Results and conclusion

- For the first time looked into the inconsistency of channel energy statistics modelling between CSS and conventional non-compressive spectrum sensing
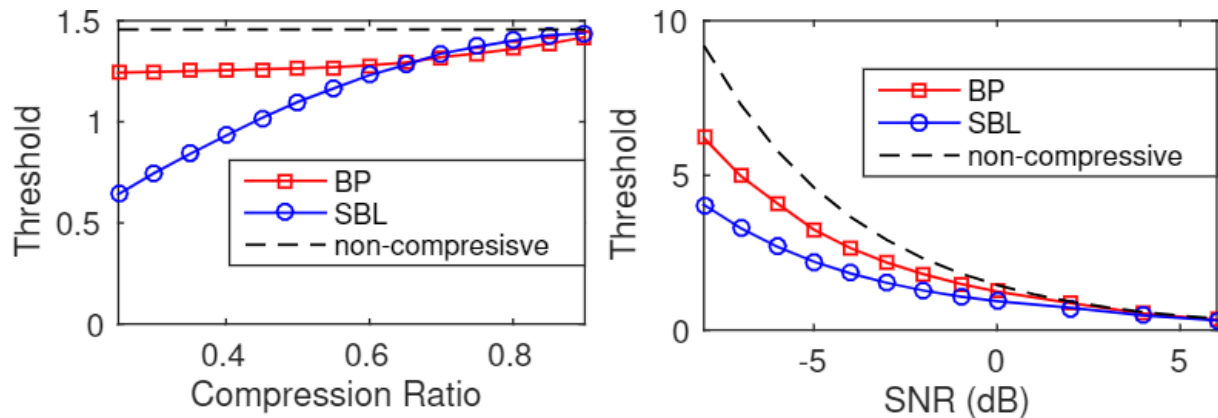
- The actual false alarm rate using the thresholds adapted by our proposed scheme are near the target value, which inversely verified the validity of our postulated statistics model

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