Eric Lybrand

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Education

University of California, San Diego — **San Diego, CA**
Ph.D. in Mathematics — *2015–2021*

University of Georgia — **Athens, GA**
B.Sc. in Mathematics (Summa Cum Laude) — *2011–2015*

Previous Employment

Brex — **San Francisco, CA**
Full Stack Data Scientist

Fraud Data Scientist II — *January 2022-Present*

- Led activities committee in identifying improvements to event streaming infrastructure.
- Configured various model monitors for detecting feature drift, performance drift, and model decision drift.

Fraud Data Scientist I — *May 2021-December 2021*

- Productionized Brex's first ever ACH fraud detection model, blocking hundreds of thousands of dollars a month in fraud spend in real time.
- Engineered over 80 streaming features to capture anomolous spending patterns.

Fraud Data Science Intern — *Summer 2019*

- Productionized Brex's first ever card transaction level fraud detection model, end-to-end from scratch.
- Model had average precision that was 3x higher than Mastercard's model for transactions from last 30 days.

University of California, San Diego — **San Diego, CA**
Academic Student Employee — *October 2015–March 2021*

Voytek Lab Research Assistant — *Summer 2020*

- Performed technical audit and added aperiodic simulations to python package NeuroDSP.

Senior Teaching Assistant — *2017-20*

- First Senior TA to serve for two consecutive years. Trained largest incoming TA class in department's history.

IPAM & NEC Corporation — **Sendai, Japan**
Graduate Student Researcher — *Summer 2018*

- Led a team of 6 Japanese and American researchers in designing a new path loss model for indoor localization using wireless received signal strength - resulted in improved localization error by 1m in several cases.

Selected Publications

[1] Eric Lybrand, Anna Ma, and Rayan Saab. "On the number of faces and radii of cells induced by Gaussian spherical tessellations". In: *Applied and Computational Harmonic Analysis* 56 (2022), pp. 176–188.

[2] Mahta Mousavi, Eric Lybrand, Shuangquan Feng, Shuai Tang, Rayan Saab, and Virginia de Sa. "Spectrally Adaptive Common Spatial Patterns". In: *arXiv preprint arXiv:2202.04542* (2022).

[3] Eric Lybrand and Rayan Saab. "A Greedy Algorithm for Quantizing Neural Networks". In: *Journal of Machine Learning Research* 22.156 (2021), pp. 1–38.

[4] M. Iwen, E. Lybrand, A. Nelson, and R. Saab. "New Algorithms and Improved Guarantees for One-Bit Compressed Sensing on Manifolds". In: *Sampling Theory and Applications* (2019).

[5] E. Lybrand and R. Saab. "Quantization for Low-Rank Matrix Recovery". In: *Information and Inference* (2018).

Selected Talks

Quantization of Neural Networks Ph.D. Defense — *February 2021*

One-Bit Compressed Sensing on Manifolds TRIPODS Summer Conference - Tucson, Arizona — *May 2019*

Quantization for Low Rank Matrix Recovery BIRS - Banff, Alberta, Canada — *October 2018*

Technical Skills

Programming Languages: Python, SQL, MATLAB, Mathematica, C++ (prior experience), R (prior experience)
Tools/Packages: pandas, Keras, numpy, scikit-learn, Git, Docker, Airflow, S3