

## Education

- 2020– **Ph.D. in Electrical and Systems Eng.**, *University of Pennsylvania*, Philadelphia, PA  
Warren Center for Network and Data Sciences, SEAS  
Advisors: *Prof. Shirin Saeedi Bidokhti* and *Prof. Hamed Hassani*  
NSF Graduate Research Fellow
- 2020– **M.S. in Electrical and Systems Eng.**, *University of Pennsylvania*, Philadelphia, PA
- 2016–2020 **B.S. in Electrical and Computer Eng.**, *Cornell University*, Ithaca, NY  
Minors in Mathematics, Computer Science

## Experience

- Summer 2022 **AI Research Intern**, *InterDigital*, New York, NY  
Hosts: Dr. Dong Tian and Dr. Muhammad Asad Lodhi  
Generative Models and Compression for 3D Data, *R&I Video Lab*
- Spring 2022 **Machine Learning Intern**, *Nokia Bell Labs*, Murray Hill, NJ  
Hosts: Dr. Iraj Saniee and Dr. Carl Nuzman  
Neural Compression, *Math & Algo. Group*
- Summer 2020 **Research Intern**, *Systems and Technology Research*, Woburn, MA  
Host: Dr. Vineet Mehta  
Graph-based Data Mining, *Cyber Group*
- Summer 2019 **Summer Research Intern**, *MIT Lincoln Laboratory*, Lexington, MA  
Hosts: Dr. Pablo Hopman and Steven Michael  
Information-Theoretic Analysis of Laser Communications, *Space Systems*

## Publications

- [1] **E. Lei**, M. A. Lodhi, J. Pang, J. Ahn, and D. Tian, “Wrappingnet: Mesh autoencoder via deep sphere deformation,” *in submission*, 2023.
- [2] **E. Lei**, Y. B. Uslu, H. Hassani, and S. S. Bidokhti, “Text + sketch: Image compression at ultra low rates,” *ICML Workshop on Neural Compression*, 2023.
- [3] **E. Lei**, H. Hassani, and S. S. Bidokhti, “Federated neural compression under heterogeneous data,” *International Symposium on Information Theory (ISIT)*, 2023.
- [4] **E. Lei**, H. Hassani, and S. S. Bidokhti, “On a relation between rate-distortion theory and optimal transport,” *ICLR Tiny Papers*, 2023.
- [5] **E. Lei**, H. Hassani, and S. S. Bidokhti, “Neural estimation of the rate-distortion function with applications to operational source coding,” *IEEE Journal on Selected Areas in Information Theory*, 2022.
- [6] **E. Lei**, H. Hassani, and S. S. Bidokhti, “Neural estimation of the rate distortion function for massive datasets,” *IEEE International Symposium on Information Theory (ISIT)*, 2022.

- [7] R. Arghal, **E. Lei**, and S. S. Bidokhti, "Robust graph neural networks via probabilistic lipschitz constraints," in *Proceedings of The 4th Annual Learning for Dynamics and Control Conference* (R. Firoozi, N. Mehr, E. Yel, R. Antonova, J. Bohg, M. Schwager, and M. Kochenderfer, eds.), vol. 168 of *Proceedings of Machine Learning Research*, pp. 1073–1085, PMLR, 23–24 Jun 2022.
- [8] **E. Lei**, H. Hassani, and S. S. Bidokhti, "Out-of-distribution robustness in deep learning compression," *ICML Workshop on Information-Theoretic Methods for Rigorous, Responsible, and Reliable Machine Learning*, 2021. **selected for 1 of 4 contributed talks.**
- [9] E. Gönültaş, **E. Lei**, J. Langerman, H. Huang, and C. Studer, "Csi-based multi-antenna and multi-point indoor positioning using probability fusion," *IEEE Transactions on Wireless Communications*, pp. 1–1, 2021.
- [10] **E. Lei**, O. Castañeda, O. Tirkkonen, T. Goldstein, and C. Studer, "Siamese neural networks for wireless positioning and channel charting," in *2019 57th Annual Allerton Conference on Communication, Control, and Computing (Allerton)*, pp. 200–207, 2019.

## Fellowships and Awards

- 2022 North American School of Information Theory (NASIT) Travel Grant Award
- 2020 NSF Graduate Research Fellowship
- 2020 Ganster Engineering Fellowship (University of Pennsylvania)
- 2020 The Dean's Fellowship (University of Pennsylvania)
- 2020 Sigma Xi
- 2019 Tau Beta Pi
- 2018 Eta Kappa Nu

## Talks

- Jun. 2023 *Federated Neural Compression Under Heterogeneous Data*, International Symposium on Information Theory (ISIT), Taipei, Taiwan.
- Apr. 2023 *On a Relation Between Rate-Distortion Theory and Optimal Transport*, ESE PhD Colloquium, University of Pennsylvania.
- Dec. 2022 *Neural Estimation of the Rate-Distortion Function With Applications to Operational Source Coding*, The Institute for Emerging CORE Methods in Data Science (EnCORE) Retreat, UC San Diego.
- Aug. 2022 Tutorial on *Neural Compression: Algorithms and Fundamental Limits*, East Asian School of Information Theory (EASIT), Shenzhen, China.
- Jun. 2022 *Robust Graph Neural Networks via Probabilistic Lipschitz Constraints*, Learning for Dynamics and Control Conference (L4DC) Poster, Palo Alto, CA.
- Jun. 2022 *Neural Estimation of the Rate-Distortion Function*, International Symposium on Information Theory (ISIT), Espoo, Finland.
- Jan. 2022 *Out-of-Distribution Robustness in Deep Learning Compression*, The Institute for Learning-Enabled Optimization at Scale (TILOS) Retreat, UC San Diego.
- Jul. 2021 *Out-of-Distribution Robustness in Deep Learning Compression*, Contributed Talk at ITR3 Workshop @ ICML.

## Teaching Experience

Spring 2022	ESE 6740: Information Theory	Head TA, UPenn
Fall 2021	ESE 5420: Statistics for Data Science	Head TA, UPenn
Spring 2020	ECE 3100: Intro to Probability and Inference	TA, Cornell
Fall 2019	CS 4780: Machine Learning for Intelligent Systems	TA, Cornell
Fall 2018	ECE 2300: Digital Logic and Computer Organization	TA, Cornell
Spring 2018 & 2019	ECE 1210: The Computing Technology Inside Your Smartphone	TA, Cornell

## Review Activities

Neural Information Processing Systems (NeurIPS)  
 IEEE Transactions on Communications  
 IEEE Journal on Selected Areas in Communications (JSAC)  
 Data Compression Conference (DCC)  
 Learning on Graphs Conference (LoG)  
 IEEE International Symposium on Information Theory (ISIT)  
 IEEE Transactions on Wireless Communication  
 International Conference on Machine Learning (ICML)

## Technical Skills

*Programming Languages:* Python, C/C++, MATLAB, Verilog, R, Java  
*Tools:* PyTorch, Tensorflow, SQL, Jax, OpenMP

## Outreach

- 2021–2022 **Science Engagement Institute**, *The Franklin Institute*, Philadelphia, PA
  - Worked with science communicators to develop strategies for sharing research with the public
- Summer 2021 **Research Mentor**, *Summer STEM Institute*, Remote
  - Mentor high school students in various data science and ML projects
  - Projects mentored: causal inference (Bayesian networks), EKG classification using CNNs
- Spring 2019 **Volunteer**, *Expanding Your Horizons*, Ithaca, NY
  - Helped lead a circuits workshop for under-represented minorities at local high schools
- 2018–2020 **Member**, *Eta Kappa Nu Honor Society*, Ithaca, NY
  - Led exam review sessions for freshman and sophomore level ECE classes
- 2018–2019 **Corporate Chair**, *IEEE Cornell Student Branch*, Ithaca, NY
  - Hosted information sessions for industry recruiting, professor talks for the student body
- 2018 **Tutor**, *Cornell University Engineering Success*, Ithaca, NY
  - Tutor for first-generation low-income students in a discrete mathematics course