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## Education

- **NYU Tandon School of Engineering**, *Ph.D. (2021 - May 2026 [expected]).* Area: Neural (distributed) lossy data compression. Advisor: Prof. Elza Erkip
- **Imperial College London**, *M.Eng., First Class Honors (2017 - 2021).* Area: Electrical Electronics Engineering. Thesis advisor: Prof. Deniz Gündüz.

## Service & Teaching

- **Co-organizer** of the *IEEE ISIT 2025 "Learn to Compress & Compress to Learn" Workshop.*
- **Co-organizer** of the *NeurIPS 2024 Machine Learning and Compression Workshop.*
- **Lead organizer** of the *IEEE ISIT 2024 "Learn to Compress" Workshop.*
- Member of the IEEE IT Society Student and Outreach Subcommittee, 2024 - present.
- *Probability and Stochastic Processes,* Fall 2024 & 2022, Graduate Teaching Assistant
- *Deep Learning,* Spring 2022, (Head) Graduate Teaching Assistant.

## Selected Awards

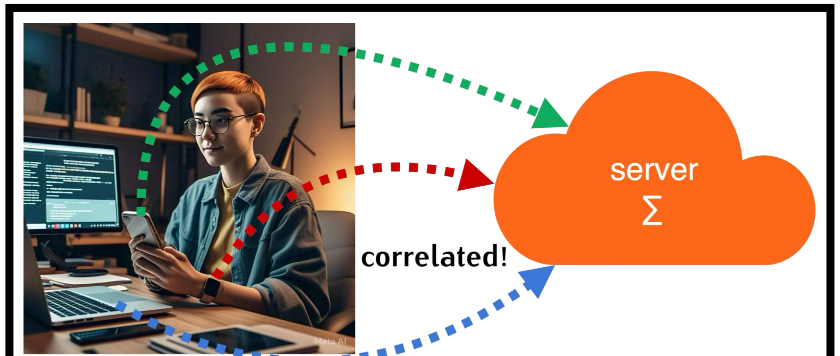
- **IEEE Signal Processing Society Scholarship** (2024–2026).
- **Best Reviewer Award**, Neural Compression Workshop @ ICML 2023.
- **2021 Ivor Tupper Prize** in Signal Processing, Imperial College London.

## Industry Experience

- (Incoming) ML/CV Intern at **Apple**
- Research Intern at **InterDigital Video Lab**
- Research Intern at **InterDigital AI Lab**

## General Research Area

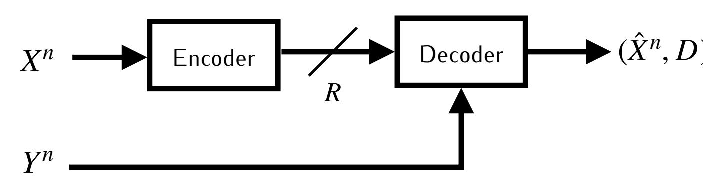
- **Research interests** Neural (data) compression, quantization, information theory, machine learning, signal processing, explainable AI.
- **PhD topic** Bridging Theory and Practice: Advancing Distributed Data Compression and Communication via Machine Learning
- Traditional compression removes redundancy within one source, while "distributed" compression leverages correlations ***across multiple data sources*** encoded independently but collaboratively.



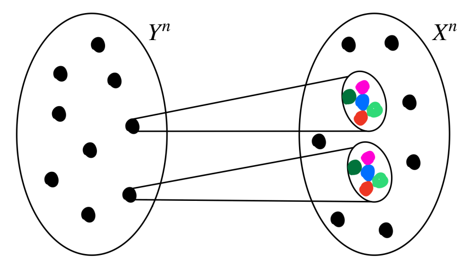

*Example of a distributed compression and inference scenario, e.g., federated learning across a single user's personal devices.*

- **Challenge** Exploiting correlation across users/ devices in distributed networks (IoT, cameras, sensors...) for practical distributed compression & inference.
- **Our solution** Translating insights from information theory into real-world applications via machine learning.
- **Impact** Edge computing/inference, federated learning, multi-view image/video compression. Foundations for fully distributed case.
- **Ongoing** Diverse correlation structures and multi-modal data within users/devices; fully distributed, scalable and robust algorithms.

## Research Contributions




**Compression w/ side information.**



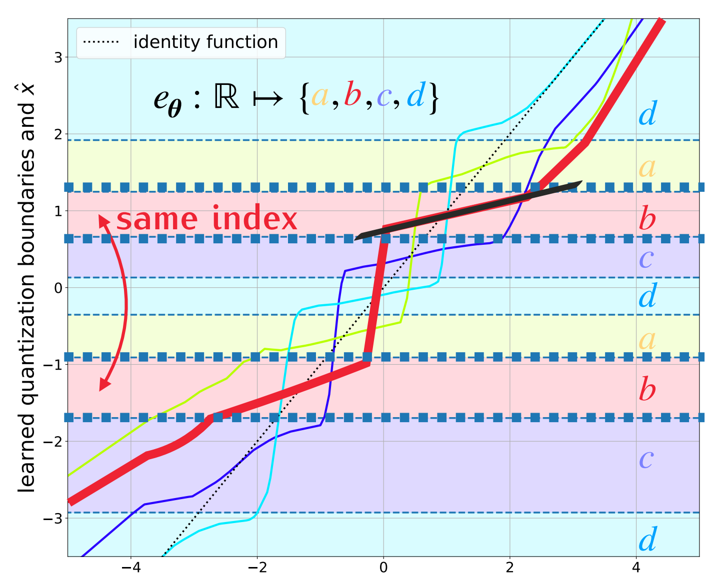

For $X^n$, send the color within the "fan" ("binning").

- **Contribution I: Leveraging Side Information Efficiently**

**Approach** Neural networks learn theoretically optimal "binning" (grouping), outperforming state-of-the-art neural compressors.

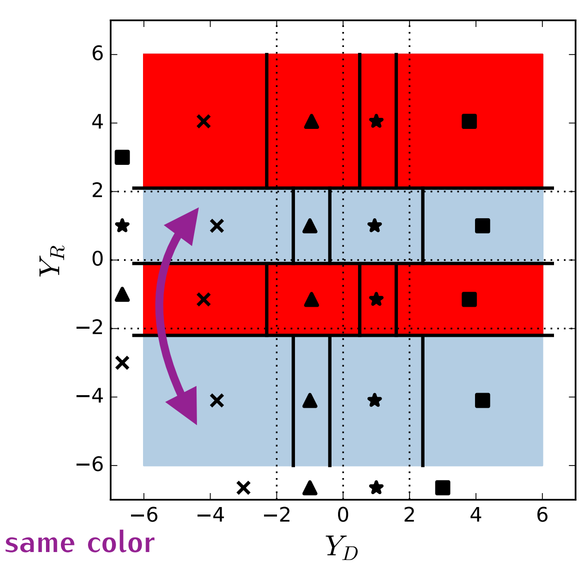
**Result** Near-optimal and interpretable performance that aligns with theory.

*Supported by Google Research Collabs Program.*




- **Contribution II: Cooperative Communication & Relaying**

**Approach** First proof-of-concept for learning-based "compress-and-forward" relaying, building onto our prior work on distributed compression.




same color
⟹ "binning" (grouping)

## Selected Publications


- **E. Ozyilkan***, F. Carpi*, S. Garg, and E. Erkip, "Learning-based compress-and-forward schemes for the relay channel," *IEEE Journal on Selected Areas in Communications, 2025.*
- **E. Ozyilkan**, J. Ballé, and E. Erkip, "Neural distributed compressor discovers binning," *IEEE Journal on Selected Areas in Information Theory*, 2024.
- **E. Ozyilkan**, J. Ballé, S. Bhadane, A. B. Wagner, and E. Erkip, "Breaking smoothness: The struggles of neural compressors with discontinuous mappings," *Wksp. on Machine Learning and Compression @ NeurIPS 2024.*
- **E. Ozyilkan**, J. Ballé, and E. Erkip, "Learned Wyner–Ziv compressors recover binning," *IEEE Int. Symp. on Information Theory*, 2023.