

# Ezgi Özyılkan

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## Education

**2021–present Ph.D.**, Electrical and Computer Engineering, NYU Tandon School of Engineering, USA.

Current GPA: 4.0.

Area: Neural (distributed) lossy data compression.  
Advisor: Prof. Elza Erkip.

**2017–2021 Integrated M.Eng.**, Electrical Electronics Engineering, Imperial College London, **first class honors**.

M.Eng. Thesis: “*Deep Stereo Image Compression with Decoder Side Information using Wyner Common Information*”.  
Advisor: Prof. Deniz Gündüz.

## Interests and Skills

**data compression** (image, 3D/point cloud, task-aware/semantic features), **information theory** (source coding, multi-terminal), **quantization** (lossy, entropy-constrained), **signal processing** (data analysis, density modeling), **(tele)communications** (distributed, cooperative), **(deep) learning** (explainable AI, interpretability), **programming** (mostly Python, JAX, PyTorch).

## Profile

I am a collaborative researcher and enjoy working with people from diverse backgrounds, which is reflected in my experiences. My current research is driven by a passion for **connecting theory and practice** in data compression and communication problems, particularly in distributed scenarios. I leverage tools from **learning, signal processing, compression** and **information theory**, yielding interpretable results. Recent collaborators include [Jona Ballé](#) and [Aaron B. Wagner](#) and [Deniz Gündüz](#).

## Industry Experience

**Incoming ML/CV Research Intern at Apple** Cupertino, CA, USA **5/2025–9/2025**

**PhD Research Intern at InterDigital Video Lab** Manhattan, NY, USA **6/2024–8/2024**

Worked on learning-based lossy 3D/point cloud compression and generative models, focusing on geometry. Hosts: Jiahao Pang, Dong Tian. *Patent application filed.*

**PhD Research Intern at InterDigital AI Lab** Los Altos, CA, USA **6/2022–8/2022**

Worked on learning-based image compression for humans and machines, focusing on scalability. Hosts: Hyomin Choi, Fabien Racapé. *Co-developed a patent and submitted a conference paper, which appeared in IEEE Data Compression Conference (DCC) 2023.*

**Business and Data (Summer) Analyst at Morgan Stanley** London, UK **6/2019–8/2019**

## Patents

H. Choi, F. Racapé, **E. Özyılkan**, and S. M. Ulhaq, “Method or apparatus rescaling a tensor of feature data using interpolation filters,” Int. Patent App. No. PCT/US2023/034255, pending.

## Teaching Experience

**Head Course Assistant at NYU Tandon** Brooklyn, NY, USA **1/2022–12/2024**

Probability and Stochastic Processes (Fall 2024, Fall 2022) and Deep Learning (Spring 2022).

## Journal Papers

**E. Özyılkan\***, F. Carpi\*, S. Garg, and E. Erkip, “Learning-based compress-and-forward schemes for the relay channel,” *IEEE Journal on Selected Areas in Communications*, expected to appear in 2025.

**E. Özyılkan**, J. Ballé, and E. Erkip, “Neural distributed compressor discovers binning,” *IEEE Journal on Selected Areas in Information Theory*, 2024. doi: [10.1109/JSAIT.2024.3393429](#).

## Conference Papers

**E. Özyılkan\***, F. Carpi\*, S. Garg, and E. Erkip, “Neural compress-and-forward for the relay channel,” in *2024 IEEE 25th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, 2024. doi: [10.1109/SPAWC60668.2024.10694419](#).

**E. Özyılkan** and E. Erkip, “Distributed compression in the era of machine learning: A review of recent advances,” in *2024 58th Annual Conf. on Information Sciences and Systems (CISS)*, 2024. doi: [10.1109/CISS59072.2024.10480175](#).

S. F. Yilmaz, **E. Özyılkan**, D. Gündüz, and E. Erkip, “Distributed deep joint source-channel coding with decoder-only side information,” in *2024 IEEE Int. Conf. on Machine Learning for Communication and Networking (ICMLCN)*, 2024. doi: [10.1109/ICMLCN59089.2024.10625214](#).

N. Mital\*, **E. Özyılkan\***, A. Garjani\*, and D. Gündüz, “Neural distributed image compression with cross-attention feature alignment,” in *2023 IEEE/CVF Winter Conf. on Applications of Computer Vision (WACV)*, 2023. doi: [10.1109/WACV56688.2023.00253](#).

**E. Özyılkan**, J. Ballé, and E. Erkip, “Learned Wyner–Ziv compressors recover binning,” in *2023 IEEE Int. Symp. on Information Theory (ISIT)*, 2023. doi: [10.1109/ISIT54713.2023.10206542](#).

\* denotes equal contribution.

E. Özyulkan\*, M. Ulhaq\*, H. Choi, and F. Racapé, "Learned disentangled latent representations for scalable image coding for humans and machines," in *2023 Data Compression Conf. (DCC)*, 2023. doi: [10.1109/DCC55655.2023.00012](https://doi.org/10.1109/DCC55655.2023.00012).

N. Mital\*, E. Özyulkan\*, A. Garjani\*, and D. Gündüz, "Neural distributed image compression using common information," in *2022 Data Compression Conf. (DCC)*, 2022. doi: [10.1109/DCC52660.2022.00026](https://doi.org/10.1109/DCC52660.2022.00026).

### Workshop Papers

E. Özyulkan, J. Ballé, S. Bhadane, A. B. Wagner, and E. Erkip, "Breaking smoothness: The struggles of neural compressors with discontinuous mappings," in *Workshop on Machine Learning and Compression, NeurIPS 2024*, 2024. OpenReview: [qcM1fkFj3Y](https://openreview.net/forum?id=qcM1fkFj3Y).

E. Taştçı, E. Özyulkan, O. K. Ülger, and E. Erkip, "Robust distributed compression with learned Heegard–Berger scheme," in *2024 IEEE Int. Symp. on Information Theory Workshops (ISIT-W)*, 2024. doi: [10.1109/ISIT-W61686.2024.10591775](https://doi.org/10.1109/ISIT-W61686.2024.10591775).

E. Özyulkan, J. Ballé, and E. Erkip, "Neural distributed compressor does binning," in *ICML 2023 Workshop on Neural Compression*, **selected for 1 of 4 contributed/spotlight talks**, 2023. OpenReview: [3Dq4FZJSga](https://openreview.net/forum?id=3Dq4FZJSga).

### Selected Honors and Awards

Invited to attend **iREDEFINE Workshop 2025** organized by ECE Department Heads Association (ECEDHA)

**IEEE Signal Processing Society Scholarship** (2024–2026).

**Best Reviewer Award** at the [Neural Compression Workshop @ ICML 2023](#).

**Future Leader Ph.D. Fellowship** (2021–2023), awarded by NYU Tandon.

Several **student travel grants** by IEEE venues, such as SPAWC 2024, ISIT 2023–2024 and North American School of Information Theory 2023, and by UC Berkeley Simons Institute to attend *"Information-Theoretic Methods for Trustworthy Machine Learning"*, Berkeley, 2023.

**2021 Ivor Tupper Prize in Signal Processing**, awarded by Imperial College London.

### Community Service

**Co-organizer** of the NeurIPS 2024 [Machine Learning and Compression Workshop](#) and IEEE ISIT 2025 ["Learn to Compress & Compress to Learn" Workshop](#).

**Lead organizer** of the IEEE ISIT 2024 ["Learn to Compress" Workshop](#).

Member of the [IEEE IT Society Student and Outreach Subcommittee](#) since 2024.

**Reviewer** for publications in both machine learning, information theory and engineering, such as **NeurIPS**, **JMLR**, **ICML**, **MLSys**, International Symposium on Information Theory (**ISIT**), Data Compression Conference (**DCC**), and several **IEEE Transactions** journals, such as Journal on Selected Areas in Communications (**JSAC**), **Transactions on Information Theory**.

### References

**Elza Erkip**, New York University Tandon School of Engineering  
[elza@nyu.edu](mailto:elza@nyu.edu)

**Aaron B. Wagner**, School of Electrical and Computer Engineering, Cornell University  
[wagner@cornell.edu](mailto:wagner@cornell.edu)

**Deniz Gündüz**, Dep. of Electrical and Electronic Engineering, Imperial College London  
[d.gunduz@imperial.ac.uk](mailto:d.gunduz@imperial.ac.uk)

**Fabien Racapé**, InterDigital AI Lab  
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