KAAN OKUMUS

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EDUCATION

Doctor of Philosophy in Communication Systems — 10/2023 – Present
Chalmers University of Technology
Supervisors: Prof. Erik G. Ström, Prof. Giuseppe Durisi

Master of Science in Communication Systems — 09/2021 – 07/2023
École Polytechnique Fédérale de Lausanne (EPFL)
Thesis: Linear inverse problems for manifolds using graph signal processing
Supervisors: Dr. Matthieu Simeoni, Dr. Joan Rué Queralt

Bachelor of Science in Electrical and Electronics Engineering — 09/2016 – 07/2021
Middle East Technical University (METU)
CGPA: 3.87/4.00, Ranked 6th out of 350 students
Specialization: Telecommunications and Signal Processing

WORK EXPERIENCE

PhD Student — 10/2023 – Present
Chalmers University of Technology

Teaching Assistant — 04/2023 – 06/2023
EPFL, School of Computer and Communication Sciences

Signal Processing Engineer Intern — 07/2022 – 09/2022
Kandou AB

Research Assistant – Pyxu Developer — 04/2022 – 09/2022
EPFL Center for Imaging

Intern — 08/2020 – 09/2020
HAVELSAN, Information and Communication Technologies

Intern — 06/2020 – 08/2020
ASELSAN, SST – Digital and Embedded Systems

RESEARCH PROFILE

Interests: wireless communication, information theory, signal processing.

Topics: massive random access, massive MIMO, user centric cell-free systems, federated learning, multi-target localization, message passing algorithms, statistical estimation.

Google scholar profile:
scholar.google.com/citations?user=K9LKq7cAAAAJ
Number of citations: **29**, h-index: **3**, i10-index: **1**

IEEE Xplore profile:
ieeexplore.ieee.org/author/37089659436
Number of citations: **18**

List of publications at the end of this document.

HONORS AND AWARDS

Award for best user interface as a member of the team, HAI-CO. 07/2021
METU, Electrical and Electronics Engineering, Senior Engineering Design Committee

Doç. Dr. Bülent Kerim Altay Award 06/2021
METU, Electrical and Electronics Engineering

Dean's High Honor Roll – 8 times (every semester) 2017 – 2021
METU, Faculty of Engineering

TEACHING EXPERIENCE

Teaching Assistant

- ESS013 Probability and statistical signal processing, Chalmers University of Technology (bachelor's course, 7.5 credits, ≈70 students): Spring 2024, Spring 2025.
- COM-405 Wireless networks, EPFL (master's course, 8 credits, ≈40 students): Spring 2023.

SUPERVISION EXPERIENCE

Master Theses/Projects

- Andreas Führ, "Sparse sampling for massive MIMO downlink CSI reference signals," Chalmers University of Technology, Ericsson AB, Gothenburg, Sweden, Feb. 2025 – Jul. 2025.

Bachelor Theses/Projects

- E. Jakobsson, C. J. Tunell, M. Walkendorff, and K. Wållgren, "SmartHear: Adaptive and learning-based noise-cancelling headphones", Chalmers University of Technology, Gothenburg, Sweden, Started in Jan. 2025.
- S. Ahmad, N. C. Collard, M. Martinsson, G. Mörck, and S. Rahimi, "Software-defined radio testbed for 6G research", Chalmers University of Technology, Gothenburg, Sweden, Started in Jan. 2025.

- L. Dahlberg, J. El-Haj, E. Erkfeldt, R. Ghalib, A. Izadi, and C. Ranström, "SmartSense: AI-driven low-cost wearable for real-time symptom detection and risk estimation", Chalmers University of Technology, Gothenburg, Sweden, Jan. 2025 – June 2025.
- V. Bengtsson, M. Wibeck, and J. Wolf-Watz, "Software-defined radio testbend for 6G research", Chalmers University of Technology, Gothenburg, Sweden, Jan. 2025 – June 2025.

PROFESSIONAL SERVICE

IEEE member since 2024

Reviewer:

- IEEE Transactions on Wireless Communications
- IEEE International Symposium on Information Theory (ISIT)

COMPUTER SKILLS

C, C++, MATLAB, Simulink, Java, Python with Numpy, Scipy, TensorFlow, PyTorch, HTML, CSS, Javascript, MySQL, Linux, Bash, Swift

LANGUAGE PROFICIENCY

Turkish (*Native Speaker*), English (*Advanced*), French (*Intermediate*), Swedish (*Elementary*), Italian (*Elementary*)

LIST OF PUBLICATIONS

Preprints, Submitted or Accepted Papers

- **Kaan Okumus**, K.-H. Hoang, G. Durisi, and E. G. Ström, "Type-based unsourced multiple access over fading channels in distributed MIMO with application to multi-target localization," Mar. 2026. [Online]. Available: https://arxiv.org/abs/2603.01749
  This paper is submitted to IEEE Transactions on Wireless Communications.
- D. P. Krishnan, **Kaan Okumus**, K.-H. Ngo, and G. Durisi, "Minimum energy per bit of unsourced multiple access with location-based codebook partitioning," (extended version), Feb. 2026. [Online]. Available: https://gdurisi.github.io/files/2026/krishnan06-02a.pdf
  This paper is submitted to IEEE Int. Symp. Inf. Theory (ISIT), Guangzhou, China, 2026.
- **Kaan Okumus**, K.-H. Hoang, U. K. Ganesan, G. Durisi, E. G. Ström, and S. R. Pandey, "Type-based unsourced federated learning with client self-selection," Feb. 26. [Online]. Available: https://arxiv.org/abs/2602.06601
  This paper is accepted to IEEE Int. Conf. Commun. (ICC), Glasgow, Scotland, UK, 2026.

Journal Papers

[J1] N. Bähler, M. E. Helou, É. Objois, **Kaan Okumus**, and S. Süsstrunk, "PoGaIN: Poisson-Gaussian image noise modeling from paired samples," in IEEE Signal Proc. Lett., Vol. 29, pp. 2602-2606, Dec. 2022.

Conference Papers

[C3] D. P. Krishnan, **Kaan Okumus**, K.-H. Ngo, and G. Durisi, "An achievability bound for type-based unsourced multiple access," in Proc. IEEE Int. Symp. Inf. Theory (ISIT), Ann Arbor, MI, USA, June 2025.

[C2] **Kaan Okumus**, K.-H. Ngo, G. Durisi, and E. G. Ström, "Type-based unsourced multiple access over fading channels with cell-free massive MIMO," in Proc. IEEE Int. Symp. Inf. Theory (ISIT), Ann Arbor, MI, USA, June 2025.

[C1] K.-H. Ngo, D. P. Krishnan, **Kaan Okumus**, G. Durisi, and E. G. Ström, "Type-based unsourced multiple access," in Proc. IEEE Int. Workshop Signal Process. Advances Wireless Commun. (SPAWC), Lucca, Italy, Sept. 2024.

Theses

[T2] **Kaan Okumus**, "Linear inverse problems for manifolds using graph signal processing," École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland, July 2023.

[T1] **Kaan Okumus**, O. Oral, S. Mert, U. Sedef, and M. Marchenkova "SYMON: Symptom monitor of COVID-19," Middle East Technical University (METU), Ankara, Türkiye, June 2021.