Oğuzhan Fatih Kar

PERSONAL DETAILS

Mail	oguzhan.kar@epfl.ch
Website	https://ofkar.github.io/
LinkedIn	https://www.linkedin.com/in/oguzhanfatihkar/
Expertise	computer vision, machine learning, computational imaging
Keywords	multi-modal foundation models, vision-language models, generative models, robustness to distribution shifts, test-time adaptation

EDUCATION

Ph.D. in Computer Science 2019-2024

Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland

Advisor: Amir Zamir

M.S. in Electrical and Electronics Engineering 2017-2019

Middle East Technical University (METU), Ankara, Turkey

Advisor: Figen S. Oktem

Thesis: Computational spectral imaging techniques using diffractive lenses and compressive sensing

Cumulative GPA: 3.93/4.00 (Top 1%)

B.S. in Electrical and Electronics Engineering 2013-2017

Middle East Technical University (METU), Ankara, Turkey

Cumulative GPA: 3.90/4.00 (Top 1%)

PROFESSIONAL EXPERIENCE

Student Researcher 2023-2024

Google, Zurich, Switzerland

- Research on developing a method that broadens visual understanding capabilities of vision-language models, leading to state-of-the-art performance for a wide range of tasks while being more efficient than other methods. Project page: Link
- The work is accepted at ECCV 2024 as oral (Top 3%) and a patent application is filed.
- Google hosts: Alessio Tonioni and Federico Tombari.

Research Assistant & Ph.D. Candidate 2019-2024

Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland

- Research on developing robust, adaptive, and multi-modal visual perception models that can operate in the real world.
- Findings are published in top computer vision & machine learning conferences (CVPR'20 oral, ICCV'21 oral, CVPR'22 oral, NeurIPS'23 spotlight, ICCV'23, ICLR'24, ECCV'24 oral, NeurIPS'24).

Research Scientist 2017-2019

ASELSAN Research Center, Ankara, Turkey

- Research on novel computational imaging techniques to improve resolution and reconstruction efficiency for the challenging infrared and multi-spectral imaging settings.

- Findings are published in high impact imaging conferences and journals (ICIP 2018, ICIP 2019, IEEE Transactions on Computational Imaging, Optics Letters)

Research Intern 2016
ASELSAN Research Center, Ankara, Turkey

- Developed and implemented non-uniformity correction algorithms to improve resolution for infrared imaging.

Digital Design Intern 2015
TUBITAK (Scientific and Technical Research Council of Turkey), Ankara, Turkey

- Implemented communication protocols between FPGA and Analog-to-Digital Converters and made performance analysis.

AWARDS AND HONORS

EPFL Computer and Communication Sciences Doctoral Program: EDIC Fellowship for the first year of Ph.D. studies (52k CHF), 2019-2020
TUBITAK (Scientific and Technical Research Council of Turkey): Full scholarship for M.S. studies, 2017-2019
METU Graduate School of Natural and Applied Sciences: Graduate courses performance award, 2019
METU Electrical and Electronics Engineering Department: Best Poster Presentation award in GRAD STAR Departmental Poster Competition, 2018
IEEE Signal Processing Society: Travel award for International Conference on Image Processing (ICIP), 2018, Athens, Greece
METU Electrical and Electronics Engineering Department: Dr. Bulent Kerim Altay award for 4.0/4.0 GPA in Fall semester, 2015
8 times (all semesters) listed in Dean's High Honor Roll, METU, 2013-2017
Ranked 228th in National University Entrance Exam 1st stage among 2 million students, 2012
Ranked 159th in National University Entrance Exam 2nd stage among 2 million students, 2012

PUBLICATIONS

Also available in Google Scholar.

Conference Publications (* denotes equal contribution, randomized order)

1. R. Bachmann*, **O. F. Kar***, D. Mizrahi*, A. Garjani, M. Gao, D. Griffiths, J. Hu, A. Dehghan, A. Zamir, "4M-21: An Any-to-Any Vision Model for Tens of Tasks and Modalities." NeurIPS, 2024. Project page: Link
2. O. F. Kar, A. Tonioni, P. Poklukar, A. Kulshrestha, A. Zamir, F. Tombari, "BRAVE: Broadening the visual encoding of vision-language models." ECCV, 2024 (**Oral, top 3%**). Project page: Link
3. H. Benoit*, L. Jiang*, A. Atanov*, **O. F. Kar**, M. Rigotti, A. Zamir, "Unraveling the Key Components of OOD Generalization via Diversification." ICLR, 2024.
4. D. Mizrahi*, R. Bachmann*, **O. F. Kar**, T. Yeo, M. Gao, A. Dehghan, A. Zamir, "4M: Massively Multimodal Masked Modeling." NeurIPS, 2023 (**Spotlight, top 4%**). Project page: Link
5. T. Yeo, **O. F. Kar**, Z. Sodagar, A. Zamir, "Rapid Network Adaptation: Learning to Adapt Neural Networks Using Test-Time Feedback." ICCV, 2023. Project page: Link
6. O. F. Kar, T. Yeo, A. Atanov, A. Zamir, "3D common corruptions and data augmentation." CVPR, 2022. (**Oral presentation, top 4%**). Project page: Link

7. O. F. Kar, T. Yeo, A. Zamir, "3D common corruptions for object recognition." ICML Shift Happens Workshop, 2022. (**Invited**). Project page: Link
8. T. Yeo*, **O. F. Kar***, A. Zamir, "Robustness via cross-domain ensembles." ICCV, 2021. (**Oral presentation, top 3%**). Project page: Link
9. A. Zamir*, A. Sax*, T. Yeo, **O. F. Kar**, N. Cheerla, R. Suri, Z. Cao, J. Malik, L. Guibas, "Robust learning through cross-task consistency." arXiv, 2020. CVPR, 2020. (**Oral presentation, best paper award nomination**). Project page: Link
10. O. F. Kar, A. Gungor, H. E. Guven, "Real-time compressive video reconstruction for spatial multiplexing cameras." IEEE Global Conference on Signal and Information Processing (GLOBALSIP), 2019. (**Oral presentation**)
11. O. F. Kar, A. Gungor, H. E. Guven, "Learning based regularization for spatial multiplexing cameras." IEEE Global Conference on Signal and Information Processing (GLOBALSIP), 2019.
12. A. Gungor*, **O. F. Kar***, "A transform learning based deconvolution technique with super-resolution and microscanning applications." IEEE International Conference on Image Processing (ICIP), 2019.
13. O. F. Kar, F. S. Oktem, "Fast computational spectral imaging using photon sieves." OSA Imaging and Applied Optics Congress, 2019. (**Oral presentation**)
14. O. F. Kar, A. Gungor, H. E. Guven, "Optimal number of measurement analysis for coded compressive focal plane array imager." IEEE Signal Processing and Communications Applications Conference (SIU), 2019. (**Oral presentation**) (**National conference**)
15. O. F. Kar, A. Gungor, H. E. Guven, "Compressive focal plane array imager reconstruction using learning based regularization." IEEE Signal Processing and Communications Applications Conference (SIU), 2019. (**Oral presentation**) (**National conference**)
16. O. F. Kar, A. Gungor, S. Ilbey, C. B. Top, H. E. Guven, "A performance analysis on the optimal number of measurements for coded compressive imaging." IEEE Global Conference on Signal and Information Processing (GLOBALSIP), 2018. (**Oral presentation**)
17. A. Gungor, **O. F. Kar**, H. E. Guven, "A matrix-free reconstruction method for compressive focal plane array imaging." IEEE International Conference on Image Processing (ICIP), 2018.
18. O. F. Kar, U. Kamaci, F. C. Akyon, F. S. Oktem, "Compressive photon-sieve spectral imaging." OSA Imaging and Applied Optics Congress, 2018. (**Oral presentation**)
19. O. F. Kar, A. Gungor, S. Ilbey, H. E. Guven, "An efficient parallel algorithm for single-pixel and FPA imaging." SPIE Defense and Commercial Sensing Conference, 2018. (**Oral presentation**)
20. O. F. Kar, A. Gungor, H. E. Guven, "An adaptive relaxed alternating direction method of multipliers for compressive focal plane array imaging." IEEE Signal Processing and Communications Applications Conference (SIU), 2018. (**Oral presentation**) (**National conference**)
21. O. F. Kar, U. Kamaci, F. C. Akyon, F. S. Oktem, "Effect of different sparsity priors on compressive photon-sieve spectral imaging." IEEE Signal Processing and Communications Applications Conference (SIU), 2018. (**Oral presentation**) (**National conference**)

Journal Publications

1. F. S. Oktem, **O. F. Kar**, C. D. Bezek, F. Kamalabadi , "High-resolution multi-spectral imaging with diffractive lenses and learned reconstruction." IEEE Transactions on Computational Imaging, 2021.
2. O. F. Kar, F. S. Oktem, "Compressive spectral imaging with diffractive lenses." Optics Letters, 2019.

OTHER ACADEMIC ACTIVITIES AND SERVICES

Invited Talks:

- **Multimodal Foundation Models**, ETH Zurich, Switzerland (June 2024).
- **Rising Stars in AI Symposium**, KAUST, Saudi Arabia (February 2023).
- **TrustML Young Scientist Seminar**, RIKEN AIP, Japan (November 2022).

Academic Demo:

- **O. F. Kar**, A. Sax, T. Yeo, A. Zamir, "Robust learning through cross-task consistency." ECCV, 2020.

Conference Reviewer:

- CVPR (2022, 2023, 2024), ECCV (2020, 2022, 2024), ICCV (2021, 2023), ICLR (2023), NeurIPS (2023, 2024), EUSIPCO (2018, 2019)

Journal Reviewer:

- Optics Express (2019, 2020), Applied Optics (2019, 2020)

PhD Application Evaluator:

- ELLIS: Fall 2021 (pre-screening)
- EPFL CS Doctoral Program (EDIC): Fall 2021, Spring 2022, Fall 2022, Fall 2023

Head Teaching Assistant:

- CS-503: Visual intelligence: machines and minds (Spring 2023, Spring 2024)

EPFL EDIC Buddy Program:

- Volunteered at the PhD Buddy Program aimed at helping new students integrate with the school and Lausanne for the years 2021, 2022, 2023, 2024.

SKILLS

Languages	Turkish (mother tongue) English (advanced) French (A2) German (A1)
Computer	Python, PyTorch, JAX, MATLAB, C, C++, LaTeX, Linux, Bash, Javascript