CANBERK EKMEKCI

Signal, Data, and Imaging Sciences Laboratory
University of Rochester, Rochester, NY, USA 14627

cekmekci.github.io
cekmekci@ur.rochester.edu

RESEARCH INTERESTS

My research centers on computational imaging and inverse problems, where I develop algorithms that combine model-based image reconstruction methodology with data-driven methods. Leveraging tools from machine learning, optimization, sampling, statistics, and uncertainty quantification, I aim to create robust, interpretable, and trustworthy imaging algorithms that address challenges traditional techniques cannot effectively solve.

EDUCATION

University of Rochester, Rochester, NY, USA Sep 2019 - Present
Ph.D. Candidate in Department of Electrical and Computer Engineering
Advisor: Prof. Mujdat Cetin

Koc University, Istanbul, Turkey Sep 2014 - Jun 2019
B.S. in Electrical and Electronics Engineering
Summa Cum Laude

EXPERIENCE

University of Rochester, Rochester, NY, USA Sep 2019 - Present
Research Assistant in Signal, Data, and Imaging Sciences Laboratory

Argonne National Laboratory, Lemont, IL, USA Jun 2024 - Aug 2024
Research Intern in Data Science and Learning Division

Turkish Aerospace Industries, Ankara, Turkey Jul 2018 - Aug 2018
Intern in Flight Mechanics and Autopilot Department

AWARDS AND HONORS

University of Rochester, Robert L. and Mary L. Sproull Fellowship Sep 2019 - Aug 2021
The most prestigious fellowship awarded by the University of Rochester.

Koc University, Salutatorian Jun 2019
Ranked second in both the EEE Department and the entire university.

Koc University, Vehbi Koc Honor Award May 2016 - May 2019
Honor award for academic excellence between Fall 2015 and Fall 2018.

University Entrance Examination in Turkey Jun 2014
Achieved a position in the top 0.01% nationally out of over 2 million candidates.

PUBLICATIONS

In Progress

Please inquire for further details.

Preprints

1. **C. Ekmekci** and Mujdat Cetin, "Conformalized Generative Bayesian Imaging: An Uncertainty Quantification Framework for Computational Imaging,", arXiv:2504.07696, 2025.

Journal Publications

1. T. Olugboji, Z. Zhang, S. Carr, **C. Ekmekci**, and M. Cetin, "On the Detection of Upper Mantle Discontinuities with Radon-Transformed Receiver Functions (CRISP-RF)," Geophysical Journal International, vol. 236, pp. 748-763, 2024.
2. **C. Ekmekci** and Mujdat Cetin, "Uncertainty Quantification for Deep Unrolling-Based Computational Imaging," IEEE Transactions on Computational Imaging, vol. 8, pp. 1195-1209, 2022.

Conference Publications

1. **C. Ekmekci**, T. Bicer, Z. Di, J. Deng, and M. Cetin, "Integrating Generative and Physics-Based Models for Ptychographic Imaging with Uncertainty Quantification," NeurIPS 2024 Workshop on Machine Learning and Physical Sciences, 2024.
2. **C. Ekmekci** and M. Cetin, "Quantifying Generative Model Uncertainty in Posterior Sampling Methods for Computational Imaging," NeurIPS 2023 Workshop on Deep Learning and Inverse Problems, 2023.
3. **C. Ekmekci** and M. Cetin, "Automatic Parameter Tuning for Plug-and-Play Algorithms Using Generalized Cross Validation and Stein's Unbiased Risk Estimation for Linear Inverse Problems in Computational Imaging," IS&T International Symposium on Electronic Imaging, 2023.
4. **C. Ekmekci** and M. Cetin, "What Does Your Computational Imaging Algorithm Not Know?: A Plug-and-Play Model Quantifying Model Uncertainty," IEEE/CVF International Conference on Computer Vision Workshops, 2021.
5. **C. Ekmekci** and M. Cetin, "Model-Based Bayesian Deep Learning Architecture for Linear Inverse Problems in Computational Imaging," IS&T International Symposium on Electronic Imaging, 2021.

TALKS AND PRESENTATIONS

Oral Presentations

1. "Bayesian Inversion for Ptychography with Deep Generative Priors", XSCOPE Seminar Series at Argonne National Laboratory, August 2024.
2. "Quantifying Generative Model Uncertainty in Posterior Sampling Methods for Computational Imaging", NeurIPS 2023 Deep Inverse Workshop, December 2023.
3. "Automatic Parameter Tuning for Plug-and-Play Algorithms Using Generalized Cross Validation and Stein's Unbiased Risk Estimation for Linear Inverse Problems in Computational Imaging", Computational Imaging XXI in Electronic Imaging Symposium, January 2023.
4. "Uncertainty Quantification for Computational Imaging", Virtual Scientific Imaging Symposium Series at Los Alamos National Laboratory, February 2022.
5. "What Does Your Computational Imaging Algorithm Not Know?: A Plug-and-Play Model Quantifying Model Uncertainty", ICCV 2021 Learning for Computational Imaging Workshop, October 2021.
6. "Model-Based Bayesian Deep Learning Architecture for Linear Inverse Problems in Computational Imaging", Computational Imaging XIX in Electronic Imaging Symposium, January 2021.

Poster Presentations

1. "Integrating Generative and Physics-Based Models for Ptychographic Imaging with Uncertainty Quantification", NeurIPS 2024 Machine Learning and the Physical Sciences Workshop, December 2024. (Visa issues prevented attendance)

PROFESSIONAL MEMBERSHIP

Professional Society

IEEE, Student Member	2019 - Present
IEEE Young Professionals, Student Member	2019 - Present
IEEE Signal Processing Society, Student Member	2019 - Present
SIAM, Student Member	2022 - 2023, 2025 - Present
SIAM Activity Group on Imaging Science, Student Member	2022 - 2023, 2025 - Present
SIAM Activity Group on Uncertainty Quantification, Student Member	2022 - 2023, 2025 - Present

ACADEMIC SERVICES

Journal Reviewer

IEEE Transactions on Computational Imaging (TCI)
SIAM Journal on Imaging Sciences (SIIMS)

Conference Reviewer

IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)

TEACHING

University of Rochester, Rochester, NY, USA

ECE458: Algorithmic Aspects of Computational Imaging (Instructor) SP 2024

Koc University Office of Learning and Teaching, Istanbul, Turkey

General Physics II (Peer Tutor) FA 2016, FA 2017
Signals and Systems (Peer Tutor) FA 2017, SP 2017
Digital Signal Processing (Peer Tutor) SP 2018

MENTORSHIP

University of Rochester, Rochester, NY, USA

Anand Idris (Co-advised with Prof. M. Cetin, B.S. Optics, 2023) Now Ph.D. student at U. Maryland