

Ulas Kamaci

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Education

University of Illinois Urbana Champaign (UIUC) , US – PhD in Electrical and Computer Engineering	Expected Dec 2025
Middle East Technical University (METU) , Ankara, Turkey – BS in Electrical and Electronics Engineering	June 2017

Experience

Graduate Researcher , UIUC – (Supervisor: Prof. Farzad Kamalabadi)	Aug 2017 – Present
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Thesis - *Computational methods for deep learning based solar snapshot spectral imaging*

- Developed a CNN based reconstruction algorithm for a snapshot spectral imaging (SSI) modality, which solves a multi-frame non-uniform semi-blind deblurring problem, significantly improving upon the previous MAP estimate
- Implemented deep posterior sampling (DPS) framework for SSI with a trained score-based diffusion prior
- Improved the reconstruction quality in SSI by adding a coded aperture in the optical and reconstruction pipeline

Milli-ArcSecond Imaging with Smallsat Enabled Super-Resolution (MAS) - *NASA Small Spacecraft Technology Program*

- Developed an optimal measurement configuration selection algorithm for the photon-sieve spectral imaging (PSSI) modality, improving the reconstructions of the multi-frame deconvolution problem

Virtual Super-resolution Optics with Reconfigurable Swarms (VISORS) - *NSF Space Weather Research Program*

- Implemented plug and play ADMM with a trained CNN denoiser for PSSI, improving the sparsity based baseline
- Developed an efficient multi-frame image registration algorithm for highly noisy and motion blurred measurements

Ionospheric CONNECTION Explorer (ICON) - *NASA Explorer Mission*

- Developed deep learning based star and artifact removal algorithms for the far ultraviolet imager (FUV) onboard the ionospheric connection explorer, significantly reducing measurement contamination, ensuring mission critical success
- Developed a statistical uncertainty quantification method, using a realistic/sophisticated noise model for the FUV instrument

Teaching Assistant, UIUC

Jan 2021 – Present

ECE 364: Programming Methods for Machine Learning | ECE 310: Digital Signal Processing | ECE 544: Pattern Recognition | ECE 558: Digital Imaging

Summer Intern, Aselsan Research Center - Ankara, Turkey

July 2016 – Aug 2016

- Developed a self-supervised sparsifying transform learning based reconstruction algorithm for MRI with the ADMM framework

Summer Intern, Udea Electronics - Ankara, Turkey

Sept 2015

- Implemented a KNN based indoor positioning method that uses RSSI data from Bluetooth beacons

Summer Intern, Mikro-Tasarim - Ankara, Turkey

July 2015

- Implemented a digital oscilloscope and a wave generator on Verilog and deployed the project on an FPGA

Selected Publications

- **Ulas Kamaci** and Farzad Kamalabadi. "Posterior Sampling for Solar Snapshot Spectroscopy with Score-Based Priors" Proceedings of the International BASP Frontiers Workshop, 2025.
- **Ulas Kamaci** and Farzad Kamalabadi. "Solar Slitless Spectroscopy with Learned Reconstruction." *in preparation* for the Astrophysical Journal.
- **Ulas Kamaci** and Farzad Kamalabadi. "Instantaneous Spectral Imaging with Learned Reconstruction." Proceedings of the International BASP Frontiers Workshop, 2023.
- **Ulas Kamaci**, et al. "Efficient sparsity-based inversion for photon-sieve spectral imagers with transform learning." 2017 IEEE Global Conference on Signal and Information Processing (GlobalSIP). IEEE, 2017.
- Evan Widloski, **Ulas Kamaci**, and Farzad Kamalabadi. "Optimal measurement configuration in computational diffractive imaging." 2020 IEEE International Conference on Image Processing (ICIP). IEEE, 2020.
- Oguzhan F. Kar, **Ulas Kamaci**, Fatih C. Akyon, and Figen S. Oktem. "Compressive photon-sieve spectral imaging." In Computational Optical Sensing and Imaging, pp. CTu5D-8. Optica Publishing Group, 2018.

Course Projects

Computer Vision, UIUC: Data Augmentation using GANs for Improving Brain Tumor Segmentation

Machine Learning for Signal Processing, UIUC: Improving SRGAN with Fourier Shell Correlation

Skills

Programming: Python, MATLAB, C/C++, Verilog

Libraries/Frameworks: PyTorch, Numpy, Scipy, Scikit-Learn, Pandas, NetCDF

Other Tools: Labview, CAD, LTspice, Linux, LaTeX, GitHub

Achievements/Honors

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| • 3rd Place in METU EE STAR - Undergraduate Research Program (out of 32 finalist projects) | Mar 2017 |
| • Best Term Project - EE230 Probability and Random Variables, METU | June 2015 |
| • Dean's High Honor List (8 times), METU | 2013 – 2017 |