

OKYANUS ORAL

METU, Department of Electrical and Electronics Engineering, ARC-209, Ankara, Turkey
ookyanusmetu@gmail.com ♦ +90 553 910 9260 ♦ ookyanus.github.io [↗](#)

Education

Middle East Technical University (METU) [↗](#)

MSc in Electrical and Electronics Engineering **CGPA: 4.00/4.00** [↗](#) 10.2021 - Present
Thesis: Three-Dimensional Near-Field MIMO Array Radar Imaging using Physics-Based Deep Neural Networks (*Advisor: Figen S. Oktem* [↗](#)).

BSc in Electrical and Electronics Engineering **CGPA: 3.80/4.00** [↗](#) 11.2017 - 09.2021
Completed all semesters with High Honors (Graduation Ranking: 10th out of 350.)
Senior year specializations in Signal Processing & Control Areas

Research Interests

- Inverse Problems
- Optimization
- Deep Learning
- Computational Imaging
- Statistical Signal Processing
- Machine Learning

Relevant Coursework :

- Theory of Remote Image Formation [↗](#)
- Advanced Statistical Signal Processing [↗](#)
- Statistical Signal Processing and Modeling [↗](#)
- Vector Space Methods in Signal Processing [↗](#)
- Linear Systems Theory I [↗](#)
- Machine Vision [↗](#)
- Optimization [↗](#)
- Pattern Recognition [↗](#)
- Computational Intelligence [↗](#)
- Digital Signal Processing [↗](#)

Publications - Under Review / Submitted

1. **O. Oral** and F. S. Oktem, "Plug-and-Play Regularization on Magnitude with Deep Priors for 3D Near-Field MIMO Imaging" in *IEEE Transactions on Computational Imaging*, 2023 (Under Review).
2. **O. Oral**, M Kiran and BM Ozyildirim, "HPS-RL: A Library for Evolutionary Search for Hyperparameter Search for Optimum Deep Reinforcement Applications" *Neural Networks*, 2022 (Under Review).

Publications - Accepted / Published

1. I. Manisali, **O. Oral**, and F. S. Oktem, I. Manisali, and F. S. Oktem, "Efficient physics-based learned reconstruction methods for real-time 3D near-field MIMO radar imaging", *Digital Signal Processing*, vol. 144, p. 104274, 2024 [↗](#).
2. **O. Oral** and F. S. Oktem, "Plug-and-Play Reconstruction with 3D Deep Prior for Complex-Valued Near-Field MIMO Imaging," *2023 31st European Signal Processing Conference (EUSIPCO)*, Helsinki, Finland, 2023, pp. 496-500, doi: 10.23919/EUSIPCO58844.2023.10290090 [↗](#).
3. **O. Oral**, E. L. Oral, and M. S. Andaç, "Comparison of the Performance of K-Nearest Neighbours and Generalized Neural Network in Construction Crew Productivity Prediction," *Çukurova Üniversitesi Mühendislik Fakültesi Dergisi*, vol. 36, no. 1, pp. 131-140, 2021. doi: 10.21605/cukurovaumfd.933867 [↗](#).

Experience

Research & Teaching Assistant, METU - Department of EEE [↗](#) 02.2022 - Present

- Courses: Vector Space Methods in Signal Processing, Digital Signal Processing, Introduction to Logic Design, Summer Practice I & II.

Researcher, Scientific & Technological Research Council of Turkey [↗](#) 11.2021 - Present

- Research on "Development of Deep Learning-based Approaches for Solving Inverse Problems in Imaging and Comparative Performance Evaluation" (Project: 120E505. PI: Assoc. Prof. Figen S. Oktem) [↗](#)

Intern, ROKETSAN - Directorate of Space Systems [↗](#)

08.2021 - 09.2021

- Conducted spectral analysis on launch vehicle liftoff vibroacoustics for acoustic protection systems.
- Prepared a review report of inertial measurement units, onboard computers, and actuators for the Micro-Satellite launch vehicle system that was in development.

Voluntary Work, Berkeley Lab Computing Sciences - ESnet [↗](#)

04.2021 - 07.2021

- Implemented Levenberg-Marquardt Algorithm with map-reduce and Vector Free Low Memory Broyden-Fletcher-Goldfarb-Shanno (VLBFGS) algorithm with map-reduce as PyTorch-Optimizers.
- Implemented a scalable genetic algorithm working on multiple CPUs for hyperparameter search of reinforcement learning models (Contributed to HPS-RL library [↗](#)).

Intern, HAVELSAN - R & D, Signal Processing Products Development Team [↗](#)

08.2020 - 09.2020

- Implemented MUSIC algorithm, conventional beam-forming method, and used CNNs for the direction of arrival estimation with 2×2 uniform rectangular arrays.

Skills

Programming Languages and Frameworks:

- Python (PyTorch, NumPy, SciPy, Matplotlib, scikit-learn, Tensorflow & Keras)
- MATLAB & Simulink (Signal Processing, Computer Vision, and Control System Toolboxes)
- C, C++ (LabVIEW, Arduino, ESP32), C# (Unity3D), Quartus-II, LTspice XVII, Siemens NX.

Languages:

English (TOEFL iBT, score 107/120), Turkish (Native), Norwegian (A1), German (A1), Russian (A1)

Awards, Certificates & Achievements

Bülent Kerim Altay Award for Spring 2019-2020 & Spring 2020-2021

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BKA award is presented by the Department of Electrical and Electronics Engineering, METU, biannually based on academic performance.

Certificates from Coursera:

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|--|----------------------------|---------|
| • Convolutional Neural Networks ↗ | by deeplearning.ai | 08.2020 |
| • Structuring Machine Learning Projects ↗ | by deeplearning.ai | 10.2019 |
| • Improving Deep Neural Networks ↗ | by deeplearning.ai | 10.2019 |
| • Neural Networks and Deep Learning ↗ | by deeplearning.ai | 09.2019 |
| • Fundamentals of Digital Image and Video Processing ↗ | by Northwestern University | 08.2019 |
| • Machine Learning ↗ | by Stanford University | 08.2019 |

IEEEExtreme 12.0 Programming Competition

10.2018

Global Ranking: 563rd out of 9500 groups - Ranking in Turkey: 11th out of 73 groups [↗](#).

Sample Term Projects [↗](#)

- Prediction of S&P500 index prices using nonlinear Bayesian estimation (**Adv. Stat. Signal Proc.**)
- Comparison of Meta-Optimizers on Optimization of Substitution Permutations for Integer Wavelet Transformation based Image Steganography (**Optimization**)
- Review of Self-Organizing Map Oversampling for Imbalanced Dataset Learning (**Pattern Recog.**)
- Self Monitoring COVID-19 Symptoms: as a member of the capstone team, designed and implemented the cough detection sub-system. (**Engineering Design I & II**)
- Range & Speed Estimation of a Constant Speed Vehicle (**Digital Signal Processing**)

Extra-Cirrucular

Worldbuilding: I have been working on my constructed language since 2019.

Sports: Running, Archery (I am a previous member of ONOK Archery Club, with a 40lb recurve bow).