

SEMIH BARUTCU

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sbarutcu.github.io

Ph.D. candidate at Northwestern University with a focus in algorithm development for inverse problems, deep learning, and computer vision. Seeking graduate internship opportunities in artificial intelligence, data science and image processing fields.

EDUCATION

Ph.D. Electrical Engineering and Computer Science

Northwestern University, Class of 2022, GPA=3.98/4.00
(Katsaggelos Image & Video Processing Lab)

B.Sc. Electrical Engineering, *summa cum laude*

Bogazici University Istanbul, Class of 2017, GPA=3.80/4.00
(Minor in Business Administration and Management)

M.Sc. Electrical Engineering and Computer Science

Northwestern University, Class of 2018, GPA=3.98/4.00

(Full Scholarship) Exchange in Electrical & Computer Eng.

University of Texas at Austin, Class of 2017, GPA=3.84/4.00

TECHNICAL SKILLS

Scripting Languages: Python, MATLAB, Java, C / C++, Bash, Verilog, SQL, LaTeX

Tools/Libraries: PyTorch, TensorFlow, Keras, Scikit-Learn, Pandas, Numpy/Scipy, Matplotlib

EXPERIENCE

Image Processing and Deep Learning Research Assistant

Sept 2017 – Present

Northwestern University – Katsaggelos' Image and Video Processing Laboratory

Evanston, IL

- Developing deep learning techniques for computational microscopic imaging methods, combining x-ray ptychography, computational tomography, and laminography.
- Building neural networks for detection of Covid-19 and Cardiac Amyloidosis from chest x-rays.
- Improving segmentation of lung lesions in CT via encoder-decoder networks
- Exploring machine learning solutions to problems in computer vision and biomedical imaging

Computational Science Intern / Senior Computational Science Intern

June – Sept 2020

Argonne National Laboratory – The Advanced Photon Source

& June – August 2018

Lemont, IL

- Creating GANs for elimination of missing wedge problem in inverse tomography and laminography.
- Developing and implementing an iterative algorithm on direct coupling of computational tomography and x-ray ptychography.

Mobile Application Developer

March – Sept 2017

Valensas Mobile Technologies

Istanbul, TR

- Developing Android applications for multiple banks and companies

R&D Engineering Intern

August – Sept 2016

Mercedes – Benz Turk

Istanbul, TR

- Simulating and testing effects of electrical motor on vehicle performance

Software Engineering Intern

June – July 2016

Aselsan Defense Industry Inc

Ankara, TR

- Application virtualization for computer programs specific to the industry

Digital Design Engineering Intern

June – July 2015

Meteksan Defense Industry Inc

Ankara, TR

- Designing a PCB to be used as a Video DAC and driving it using HDL

SELECTED PUBLICATIONS

- S. Barutcu et al. (2020). “Simultaneous 3D X-Ray Ptycho-Tomography with Gradient Descent”. *Proceedings of International Conference on Image Processing (ICIP)*.
- S. Barutcu et al. (2021). “Computed Tomography Reconstruction via Deep Image Prior and Alternating Direction Method of Multipliers.”. *Nature - Scientific Reports (In Review)*.
- R. M. Wehbe, S. Barutcu et al. (2020). “DeepCOVID-XR: An Artificial Intelligence Algorithm to Detect COVID-19 on Chest Radiographs Trained and Tested on a Large US Clinical Dataset”. *Radiology*.
- P. Shedligeri, S. Barutcu et al. (2021). “Improving Acquisition Speed of X-Ray Ptychography through Spatial Undersampling and Regularization.” *Proceedings of International Conference on Image Processing (ICIP)*. (In Review).
- S. Barutcu, L. Arslan. (2017). “Topic Classification Using Bidirectional LSTM Neural Networks.” *Bogazici University Undergraduate Thesis*. Print.