SEMIH BARUTCU

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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.