

# SEMIH BARUTCU

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[sbarutcu.github.io](https://sbarutcu.github.io)

Ph.D. candidate at Northwestern University with a focus in algorithm development for inverse problems, deep learning, and computer vision. Seeking full-time 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.
- Exploring machine learning solutions to problems in computer vision and biomedical imaging

### PhD Software Engineering Intern

*June – Sept 2021*

*Uber*

*San Francisco, CA*

- Optimize near-real time streaming pipelines for business critical ML Features and metrics.
- Onboard micro-services to tracing platform, and implement error categorization together with exception types for improving debuggability.

### 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 - Valensas Mobile Technologies

*March – Sept 2017*

### R&D Engineering Intern - Mercedes – Benz Turk

*August – Sept 2016*

### Software Engineering Intern - Aselsan Defense Industry Inc

*June – July 2016*

### Digital Design Engineering Intern - Meteksan Defense Industry Inc

*June – July 2015*

## SELECTED PUBLICATIONS

- **S. Barutcu et al.** (2022). “Compressed Ptychography using Deep Generative and Image Priors”. *IEEE Transactions on Computational Imaging* (In Review).
- **S. Barutcu et al.** (2021). “Limited-Angle CT with Deep Image and Physics Priors”. *Nature - Scientific Reports*.
- **S. Barutcu et al.** (2020). “Simultaneous 3D X-Ray Ptycho-Tomography with Gradient Descent”. *Proceedings of International Conference on Image Processing (ICIP)*.
- 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)*.
- **S. Barutcu et al.** (2022). “Undersampled Ptychography with Deep Generative Priors and ePIE” (In Preparation).
- **S. Barutcu, L. Arslan.** (2017). “Topic Classification Using Bidirectional LSTM.” *Bogazici University Undergraduate Thesis*.