Nikola Janjušević

Brooklyn, NY ◇ nikola@nyu.edu ◇ https://nikopj.github.io

Research Statement

I am interested in **imaging inverse-problems** and **Deep Neural Networks (DNNs)**.

I have focused my Ph.D on the **interpretable-construction of DNNs** and leveraging this understanding to achieve robustness to inference-time changes in observation model. **I believe principled construction leads to better performance and novel capabilities.**

I have worked with different modalities (accelerated MRI, RAW image DeMosaicing) and different noise distributions (Poisson, salt-and-pepper, AWGN), in both **supervised and unsupervised learning** settings.

Work Experience

Apple Video Engineering, Research Intern
"White-box" reference-guided image enhancement.
Summer 2022, Cupertino, CA

Samsung Research America, Research Intern
Survey of fast novel-view synthesis methods for video involving with comparisons on in-house data.
Summer 2021, Plano, TX (remote)

Teaching Experience

The Cooper Union, Adjunct Professor
ECE-150 Digital Logic Design.
Fall 2022, New York, NY

NYU Tandon, Teacher's Assistant
ECE-GY 6123 Image and Video Processing.
Spring 2022, 2023, Brooklyn, NY

NYU Summer STEM, Senior Instructor
Introduction to Machine Learning.
Summer 2019, Brooklyn, NY

Awards and Honors

NYU Shiv Panwar Scholarship 2021-2023
Telephonics Research Fellowship 2020
NYU K-12 STEM Fellowship 2019
Radio Club of America Scholarship 2019
CU Half-Tuition Scholarship 2015-2019
CU Innovator's Merit Scholarship 2015-2019

Education

New York University
Ph.D Electrical Engineering, GPA: 3.82/4.00
Advisor: Professor Yao Wang, NYU Video Lab
Fall 2019 - Present, Brooklyn, NY

The Cooper Union
Bachelors of Engineering, Electrical Engineering
Magna Cum Laude
Minor in Computer Science
Fall 2015 - Spring 2019, New York, NY

Selected Graduate Courses:
Math-GA 20(10,20) Numerical Methods I, II
Math-GA 2012 Non-smooth and Convex Optimization
Math-GA 2012 High Performance Computing
ECE-GY 6813 Medical Imaging

Selected Skills:
Julia (Lux, CUDA), Python (PyTorch), C (OpenMP), Matlab, Bash, Manim, LaTeX(PGFplots, TikZ)

Publications

[1] N. Janjušević, A. Khalilian-Gourtani, A. Flinker, and Y. Wang, *Fast and Interpretable Nonlocal Neural Networks for Image Denoising via Group-Sparse Convolutional Dictionary Learning*, preprint 2023. code.

[2] N. Janjušević, A. Khalilian-Gourtani and Y. Wang, *CDLNet: Noise-Adaptive Convolutional Dictionary Learning Network for Blind Denoising and Demosaicing*, IEEE OJSP 2022. code.

[3] N. Janjušević, A. Khalilian-Gourtani and Y. Wang, *Gabor is Enough: Interpretable Deep Denoising with a Gabor Synthesis Dictionary Prior*, IEEE IVMSP 2022. code.

Last updated: June 2023