

NIKAN DOOSTI



- **Status:** MSc, Deep Learning Engineer
- **Tech:** PyTorch, Python, Numpy, Scipy, SKlearn
- **Fields:** Deep Learning, Visual Computing, Computer Graphics

Summary

I am a final-year master's student in computer engineering at IUST focusing on *applications of artificial intelligence in science*. Furthermore, I was mainly focused on classic and deep computer vision particularly *image processing* and applications of machine learning in technology. Generally *I highly appreciate interdisciplinary work* between AI and science and actualize *digital twin*.

Experience

Jul, 2020 - Mar, 2021

Research Assistant (Remote)

Max Planck Institute for Informatics

This was my first mutlidisciplinary work which led to publication of my first-ever academic paper at ACM Symposium on Computational Fabrication (SCF21)!

- Studying numerical simulation methods such as Finite Element Method (FEM) for solving Topology Optimization (TO) problem
- Studying and reproducing recent papers in implicit neural representation, neural radiance fields, neural PDEs, and Fourier neural operators
- Stuyding different projection(activation)/smoothing filters and their effect on optimization and mesh-based solutions
- Developing a novel frequency aware model to solve TO in fully self-supervised manner via neural fields

Supervisor: Dr. Vahid Babaei (Computational manufacturing researcher at Max Planck Institute for Informatics and group leader at AIDAM)

Aug, 2016 - Jun, 2020

Freelancer

Independent

To help with the expenses and learn more, during my study in BSc and earlier stages of MSc, I was working as a freelancer partially.

- Occasionally teaching university courses as a private tutor
- Designing, participating and implementing evolutionary algorithms such as genetics for routing problem in university research projects
- Designing, participating and implementing classical computer vision and deep learning based models for different topics from reading car plates, image classification, counting objects, etc.

Publications and Talks

Publications:

- Doosti, Nikan, Julian Panetta, and Vahid Babaei. "Topology Optimization via Frequency Tuning of Neural Design Representations." In *Symposium on Computational Fabrication*, pp. 1-9. 2021 ([Abstract](#)/[PDF](#))

Invited Talks:

- Doosti, Nikan. 2022. "Neural Design Representations." Toronto Geometry Colloquium. March 4, 2022. toronto-geometry-colloquium.github.io. ([Video](#)-[Poster](#))

Education

Aug, 2019 - Present

MSc Computer Engineering

Iran University of Sc. and Tech. (IUST)

Awards:

- Full tuition fee waiver
- Overall grades (so far): 17.17/20
- Accepted as an exceptional talent (no entry exam)

Thesis: Toward super-resolution neural topology optimization (in progress)

Supervisor: Dr. Nasser Mozayani (Associate professor of department of computer engineering)

Aug, 2015 - Aug, 2019

BSc Computer Engineering

University of Guilan

Awards:

- › Full tuition fee waiver
- › Overall grade: 18.63/20 (Ranked **3rd**)
- › Exceptional talent at Department of Computer Engineering

Teacher assistant experience:

- › Advanced programming (Head TA), instructor: *Dr. Mirroshandel*, Fall 2018
- › Algorithms, instructor: *Dr. Shakeri*, Spring 2017
- › Algorithms (Head TA), instructor: *Dr. Shakeri*, Fall 2018
- › Computational Intelligence (Head TA), instructor: *Dr. Shakeri*, Spring 2018

My primary responsibilities as the TA were assessing and designing assignments and teaching as the head TA.

››› Selected Projects

2017	Paper Implementation	Open Source
Sole open source implementation of <i>Using Genetic Algorithms for Multi-depot Vehicle Routing (Ombuki-Berman et al. 2009)</i> via Python as part of <i>Computational Intelligence</i> course. (github.com/Nikronic/Optimized-MDVRP)		
2019	Paper Implementation	Open Source
Sole open source implementation of <i>Deep Context-aware Descreening and Rescreening of Halftone Images (Kim, T.H et al. 2018)</i> via PyTorch. This was the my first-ever PyTorch project. (github.com/Nikronic/Deep-Halftoning)		
<ul style="list-style-type: none"> › <u>CoarseNet</u>: Modified U-Net as a low-pass filter to remove halftone patterns › <u>DetailsNet</u>: A GAN for improving details › <u>EdgeNet</u>: A simple CNN to extract Canny edge features to preserve details › <u>Halftoning Algorithms</u>: Implementation of some of the halftone algorithms provided in digital color halftoning books as the ground truth 		

››› Voluntary Activities

Oct, 2018 - Present	Lecturer	Rasht School of AI (schoolofai.ir)
School of AI is a community of passionate people about learning and teaching AI, mostly enabled by students from different fields of study. In this community, we would like to personalize learning paths and create a network to learn more about machine learning and deep learning and their applications. All sessions are free and recordings are available publicly. (github.com/rasht-school-of-ai)		
Sep, 2020- Aug, 2021	Maintainer and Developer	IUST Projects (iust-projects.ir)
IUST Projects is an open GitHub organization with a focus on showcasing and maintaining projects created at Iran University of Science and Technology. This <i>organization is maintained by its true owners, the students of any institute</i> . This was an attempt to overcome the siloed culture of univeristy and show that everyone can be competitive and improve in a engagning and friendly environment. (github.com/iust-projects) Topics: Imbalance learning, ensembles, feature extraction, NN architectures, Hough transform, edge detection, shape fitting, Fourier/Cosine transform, geometrical/textural feature engineering, and <u>more</u>)		
Nov, 2018 - Present	Member	PyTorch Discuss Forum
Since the day I started deep learning with PyTorch, I started reading topics around my questions and tried to answer questions that I was not familiar with which helped me to dive deeper into the framework, learn many of hacks and return the favor! At the time of writing, <i>I've visited the forum for 851 days, 563 posted replies, 3000 read topics and 184 solutions (All-time 15th)</i> (discuss.pytorch.org/u/nikronic/summary)		

››› Languages

- › Persian: Native
- › English: Proficient

››› References

Available upon request.