

NIKAN DOOSTI | RESUME

- » **Status:** M.Sc. Computer Engineering, Artificial Intelligence
- » **Tech:** Python, PyTorch, Scipy/Numpy, C++
- » **Fields:** Deep Learning, Computational Fabrication, Visual Computing, Computer Graphics



»»» Summary

I am a final-year master student in computer engineering at IUST focusing on *applications of artificial intelligence in science*. Before that, I was mainly focused on computer vision particularly *image processing* and applications of machine learning in technology. Currently, I am looking for a PhD position in areas aforementioned above, and generally *I love to do interdisciplinary work* between AI and science.

»»» Experience

Jul, 2020 - Mar, 2021 **Research Assistant (Remote)** **Max Planck Institute for Informatics**

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

My responsibilities:

- » Studying numerical simulation concepts such as FEM for solving Topology Optimization (TO) problem
- » Studying and evaluating recent papers in implicit neural networks and solving PDEs using deep learning
- » Implementing and reproducing results of the main references
- » Developing a new system to solve TO in fully self-supervised manner via neural fields

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

Aug, 2016 - Jun, 2020 **Freelancer** **Independent**

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

My responsibilities:

- » Writing small pieces of software for desktop computers mostly in C#
- » Designing, consulting and implementing standard algorithms and data structures for designing efficient systems
- » Designing, consulting and implementing evolutionary algorithms such as genetics for developing efficient systems in different topics
- » Designing, consulting and implementing classical computer vision and deep learning based models for different topics from reading car plates, tracking speed of cars, counting objects and measuring surfaces.

»»» 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

»»» Education

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

Related coursework:

- › Algorithms and data structure
- › Artificial Intelligence and Computational Intelligence
- › Classical computer vision, statistical NLP
- › Signal and systems
- › Digital electronics and computer aided design (VHDL)

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.

Aug, 2019 - Present

MSc Computer Engineering

Iran University of Science and Technology

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)

››› 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.

You can find the material here: 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 website and its *organization is maintained by its true owners, the students* and the contributors outside of the university, so no, this is not an official university website and it is open to anybody who wants to join! (*Failed!!*)

You can find all the materials here: github.com/iust-projects

Main works:

- › Assignments and solutions in form of blog posts for better readability
- › Hosts course notes, curriculum, etc of AI majors

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've visited the forum for 851 days, 563 posted replies, 10000 read posts and 184 solutions (All-time 15th)*

View the summary: discuss.pytorch.org/u/nikronic/summary

Selected Projects

2016

Paper Implementation

Open Source

Implementation of *Using Genetic Algorithms for Multi-depot Vehicle Routing (Ombuki-Berman et al. 2009)* using Python as part of *Computational Intelligence* course.

You can find the source code here: github.com/Nikronic/Optimized-MDVRP

Main contributions:

- Only open-source implementation with reproducability
- Improving mutation and replacement modules of Genetics optimizer
- Outperforming the original paper

2018

Paper Implementation

Open Source

Implementation of *Deep Context-aware Descreening and Rescreening of Halftone Images (Kim, T.H et al. 2018)* using PyTorch. This was the my first project using PyTorch where I learned this framework.

You can find the source code here: github.com/Nikronic/Deep-Halftoning

Main contributions:

- Only open source implementation
- The implementation can be divided into below separate projects:
 - CoarseNet: Modified U-Net as a low-pass filter to remove halftone patterns
 - DetailsNet: A CNN generator and two discriminators for adding details
 - EdgeNet: A simple CNN to extract Canny edge features to preserve details
 - Halftoning Algorithms: Implementation of some of the halftone algorithms provided in most recent digital color halftoning books as ground truth

Languages

- Persian/Farsi: Native
- English: Proficient

References

Available upon request.