

# 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 and group leader at CAM group)

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](https://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](https://github.com/rasht-school-of-ai)

Sep, 2020- Aug, 2021

**Maintainer and Developer**

**IUST Projects ([iust-projects.ir](https://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](https://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](https://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](https://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](https://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.