

Amir Mohammad Babaei

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Education

Sharif University of Technology (SUT)

MSC IN COMPUTER ENGINEERING, **ARTIFICIAL INTELLIGENCE AND ROBOTICS**

Tehran, Iran
Sep. 2023 - Present

- GPA: **18.33/20.00 (4.00/4.00)**
- Member of **Sharif Image Processing Laboratory (Sharif IPL)**
- Supervisor: **Prof. Shohreh Kasaei**
- **Thesis:** Blind Image Super-Resolution Using Deep Generative Neural Network Architectures

Amirkabir University of Technology (AUT)

BSC IN COMPUTER ENGINEERING

Tehran, Iran
Sep. 2019 - Sep. 2023

- GPA: **19.09/20.00 (3.96/4.00)**
- Ranked **4th** among 149 students
- Supervisor: **Dr. Maryam AmirMazlaghani**
- **Thesis:** Graph-based Convolutional Multivariate Time Series Forecasting Approach for Urban Traffic Forecasting

Research Interests

Image Super-Resolution	Instance Segmentation	Deep Generative Models
Image Restoration	Computer Vision	Deep Learning

Research Experience

Sharif University of Technology - Image Processing Laboratory (IPL)

Tehran, Iran
Nov. 2023 - Present

ADVISOR: **PROF. SHOHREH KASAEI**

- Focused on Efficient Super-Resolution, seeking to develop a novel lightweight architecture.
- My thesis focuses on improving the efficiency of deep generative models for Image Super-Resolution, especially diffusion models.
- Developed a novel weakly-supervised approach for video instance segmentation (VIS), enabling accurate segmentation without relying on video mask annotations.

University of Toronto - Dept of Electrical and Computer Engineering

Full Remote
Nov. 2022 - Aug. 2024

ADVISOR: **DR. ALIREZA ESMAELZEH**

- Collaborated with Dr. Alireza Esmaeilzahi, Postdoctoral Fellow at the University of Toronto, on advanced deep learning and computer vision research since Fall 2022. Co-authored and submitted a paper in Computer Vision to a highly reputable journal.

Publications

UNDER REVIEW

- Arefi, F., **Babaei, A.M.**, Ramezani, V., Mansourian, A.M., Kasaei, S., “**Improving Weakly-supervised Video Instance Segmentation Using Keypoints Consistency**,” *Computer Vision and Image Understanding Journal*, Submitted in November 2024
- Esmaeilzahi, A., **Babaei, A.M.**, Nooshi, F., Zaredar, H., Ahmad, M.O., “**CLBSR: A Deep Curriculum Learning-based Blind Image Super Resolution Network using Geometrical Prior**,” *Image and Vision Computing Journal*, Submitted in July 2024 (received Major Revision)

IN PREPARATION

- Babaei, A.M.**, Nabati, S., Dehghanian, Z., AmirMazlaghani, M., “**GSCINet: Graph-based Convolutional Multivariate Time Series Forecasting Approach for Urban Traffic Forecasting**,” Work in Progress

Honors and Awards

2023	Reviewer for the Circuits, Systems, and Signal Processing (CSSP) Journal	SUT
2023	Admitted to the Master of Science program at Sharif University of Technology based on exceptional academic performance , without the need for an entrance exam	SUT
2023	Ranked 4th Highest GPA among 149 Undergraduate Computer Engineering Students	AUT
2019	Among the top 1% of the Iranian University Entrance Exam and Recognized as an Outstanding Student	AUT

Languages

- English (TOEFL iBT: **101 (R:28, L:27, S:23, W:23)**)
- Persian (Native)

Teaching Experience

Fall 2024	Deep Learning Teaching Assistant , Computer Engineering Dept., under the supervision of Prof. Hamid Beigy	SUT
	Advanced 3D Computer Vision Teaching Assistant , Computer Engineering Dept., under the supervision of Prof. Shohreh Kasaei	SUT
Spring 2024	Fundamental of 3D Computer Vision Teaching Assistant , Computer Engineering Dept., under the supervision of Dr. Hanieh Naderi	SUT
Spring 2023	Head of Data Mining Teaching Assistance , Computer Engineering Dept., under the supervision of Prof. Ehsan Nazerfard	AUT
	Applied Linear Algebra Teaching Assistant , Computer Engineering Dept., under the supervision of Prof. Maryam AmirMazlaghani	AUT
Spring 2022	Signals and Systems Teaching Assistant , Computer Engineering Dept., under the supervision of Dr. Atefeh TermehChi	AUT
Fall 2021	Head of Applied Linear Algebra Teaching Assistance , Computer Engineering Dept., under the supervision of Prof. Ehsan Nazerfard	AUT
	Data Structures and Algorithms Teaching Assistant , Computer Engineering Dept., under the supervision of Prof. Sajad Shirali Shahreza	AUT

Professional Experience

May 2023 - Feb. 2024	Data Scientist , Collaborated to develop data-driven solutions for the company challenges. Contributed to the development of <i>channel classifier</i> , <i>channel recommender system</i> , and <i>intelligent advertisement</i> projects as part of the data science team at Bale.	Bale Messenger
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Skills and Expertise

Programming Languages	Python, Java, C/C++, MATLAB (GNU Octave)
Tools	Git, Linux, Bash, GDAL, L ^A T _E X, FFmpeg, OpenMP, CUDA, LangChain, Ollama, AWS EC2
Libraries & Frameworks	PyTorch, BasicSR, KAIR, PyTorch Geometric, Hugging Face Transformers, JAX, Keras, TensorFlow, Numpy, OpenCV, Pandas, Scikit-learn, Matplotlib

Selected Projects

For a complete list of projects, please visit my GitHub: github.com/AmirMohamadBabaei

- **Deep Learning Homework Assignments**
In these assignments, I implemented various algorithms, including *PCA*, *t-SNE*, *autoencoders*, *CNNs*, *RNNs*, *LSTMs*, *GRUs*, *language models*, *GNNs*, *GANs*, *VAEs*, and *reinforcement learning*. Each method was applied to different tasks, and the results were documented throughout the project. [\(Link\)](#)
 - **Deep Generative Models Homework Assignments**
The assignments involved implementing popular generative models, including *autoregressive models*, *VAEs*, *GANs*, *NF*, *EBM*, and diffusion models like *DDPM*. [\(Link\)](#)
- **Digital Image Processing Homework Assignments**
In this series of assignments, I explored *Fourier Series Analysis*, *quantization techniques*, *DCT compression*, and *CLAHE* for image enhancement. I also worked on *image restoration*, *Hough transform*, *template matching*, *classical segmentation*, *image compression*, and *morphological image processing*. [\(Link\)](#)
 - **Panorama**
This project focused on creating an application replicating a cellphone camera's panoramic feature. It included tasks like *feature matching* and *image stitching* to build the panorama from scratch. [\(Link\)](#)

Certificates

Coursera	Machine Learning (Certificate)	Stanford	CS224n : NLP with Deep Learning (Audited)
Coursera	Deep Learning (Certificates: 1 , 2 , 3 , 4 , 5)	Stanford	CS224W : Machine Learning with Graphs (Audited)
Coursera	Mathematics for Machine Learning (Certificate)	Stanford	CS236 : Deep Generative Models (Audited)