Parham **Zilouchian Moghaddam**

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Education

University of Tehran (UT), Ranked 1st among Best Global Universities in Iran (USNews-2023) — *Tehran, Iran*

- *M.Sc. in Computer Engineering (Computer Architecture)* — *Sep. 2019 – Feb. 2023*
- Cumulative GPA: **19.18/20 (3.88/4)**
- Thesis: *Designing Generative Models for Developing Deep Learning Applications in Video Compression*

University of Kashan (UK), Ranked 3rd among Best Global Universities in Iran (Times-2019) — *Kashan, Iran*

- *B.Sc. in Computer Engineering, (Software Engineering)* — *Sep. 2015 – Sep 2019*
- GPA (last **two** years): **18.25/20 (3.96/4)** | Cumulative GPA: **17.68/20 (3.81/4)**
- Thesis: *Deep learning based on Support Vector Machine (SVM)*

Research Interests

- ☑ Deep Learning
- ☑ Generative Models
- ☑ Computer Vision
- ☑ Trustworthy AI
- ☑ Data Analysis
- ☑ NLP

Research Experience

Research Assistant in Computer Vision Lab — *April 2023 – Present*

- *Supervised by Dr. Mostafa Tavassolipour , Dr. Mohammad Amin Sadeghi* — *University of Tehran, Iran*
  - Developing a generative network for voice adaptation in voice memos, a pioneering and challenging endeavor in speech processing.
  - Working on developing a diffusion model-based method to surpass the performance of existing counterparts.

Research Assistant in Network on Chip Laboratory — *2019 – Present*

- *Supervised by Dr. Mehdi Modarressi* — *University of Tehran, Iran*
  - We are trying to optimize and enhance GANs' more efficiency using various Neural Network acceleration techniques.
  - Working on optimizing AutoEncoders and specifically on our proprietary customized neural network named "NU-Class Net".
  - Working on enhancing LSTMs power efficiency for portable healthcare devices without compromising accuracy.
  - Refining the famous "Wav2Vec2" model for increased speed and robustness by reducing its network size.

Research Assistant in Computational Modeling and Machine Learning Lab — *Jan. 2020 – Feb. 2023*

- *Supervised by Dr. Mehdi Modarressi , Dr. Mohammad Amin Sadeghi* — *University of Tehran, Iran*
  - Developed the "NU-Class Net", a fully customized Deep Neural Network, to enhance low-bitrate video quality.
  - Implemented a strategy to significantly reduce video size (roughly 700%) and utilized a custom network to optimize quality restoration.
  - Developed three methods to achieve these results, and we have published our work in a paper and submitted it to a renowned journal.

Artificial Intelligence Researcher — *2018 – 2019*

- *Supervised by Dr. Javad Salimi* — *University of Kashan, Iran*
  - Worked on integrating a *Deep Neural Network* with a *SVM* model in order to improve classification accuracy.
  - Achieved a 5% accuracy boost on various datasets compared to standard Deep Neural Networks.

Augmented Reality Researcher — *2017 – 2019*

- *Supervised by Dr. Javad Salimi* — *University of Kashan, Iran*
  - Developed a Unity application capable of detecting surfaces and placing objects on appropriate surfaces.
  - Evaluated the application by placing cars, action figures, and more on identified surfaces.

Publications

- **P.Z. Moghaddam**, Mehdi Modarressi, M.A. Sadeghi "*NU-Class Net: A Novel Deep Learning-based Approach for Video Quality Enhancement,*". IEEE Transactions on Circuits and Systems for Video Technology; (Submitted) *2023*
- SHSA Rezaei, **P.Z. Moghaddam**, Mehdi Modarressi "*Smart Memory: Deep Learning Acceleration In 3D-Stacked Memories,*". Computer Architecture Letters (CAL) Journal; (Accepted) *2023*
- **P.Z. Moghaddam**, Mehrdad Charbaghi, J.S. Sartakhti, "*Faster Wav2Vec: A new approach to improve the model speed,*". University of Tehran & University of Kashan; (in Preparation) *2023*
- **P.Z. Moghaddam**, J.S. Sartakhti, "*Deep Learning based on Support Vector Machine (SVM),*". 5th National Conference on Distributed Computing and Big Data Processing (in Persian) *2019*
- **P.Z. Moghaddam**, F. Lotfali, J.S. Sartakhti, "*Improvement of a robot behavior in a real-time game using Gray Wolf optimizer,*". 2nd International Computer Games Conference; Opportunities and Challenges (in Persian) *2019*

Honors & Awards

- Eligible to use the University of Tehran **'Straight' Ph.D. Admission offer** as **an Exceptional Talented Student** and being exempt from taking the university entrance exam. *2023*
- **Ranked 1st** with the **highest overall GPA** among M.Sc. Computer Engineering (CA) students at University of Tehran. *2022*
- Student member of "**Iranian Society of Engineering Education.**" *2022*
- Received the University of Tehran **'Straight' M.Sc. Admission offer** as **an Exceptional Talented Student** and being exempt from taking the university entrance exam. *2019*
- Received University of Kashan and Shahid Beheshti University **'Straight' M.Sc. Admission offer** as an exceptional talented student and exempt from taking the university entrance exam. *2019*
- **Ranked 2nd in terms of GPA**, among Computer Software Engineering Students at University of Kashan *2019*
- **Awarded as a Distinguished Student** by The University Committee for the Exceptional Talents - University of Kashan *2018*

Technical Skills

- **Programming Languages**: Python(NumPy, Pandas, Pytorch, Keras, Tensorflow), Java, C/C++, Matlab, SQL (Postgres, MySQL), JavaScript, HTML/CSS, VHDL, Julia, R
- **Frameworks**: Django, React, Node.js, Flask, JUnit, WordPress, Material-UI, FastAPI
- **Developer Tools**: Git, FFmpeg, Apache Hadoop, RapidMiner, Unity, Google Cloud Platform, VS Code, Visual Studio, PyCharm, IntelliJ, Eclipse, Photoshop, Enterprise Architect, Houdini
- **Typesetting Tools**: LaTeX, Microsoft office
- **Soft Skills**: Leadership, Willingness to help, Adaptability, Problem-solving, Dependability
- **Hard Skills**: Machine Learning, Deep Learning, Computer Vision, Pattern Recognition, Statistics, Big Data Analysis, etc.
- **Languages**: English [IELTS: Overall 7.5 (L:8.5, R:7.5, S:6.5, W:7.0)], Persian (Native), Arabic(Intermediate)

Selected Teaching Experiences

- **Trustworthy AI**, Head T.A., (Dr. Sadeghi & Tavassoli) @ UT *2023*
- **Generative Models**, T.A., (Dr. Sadeghi & Tavassoli) @ UT *2023*
- **Generative Models**, T.A., (Dr. Sadeghi & Tavassoli) @ UT *2022*
- **Data Analysis**, T.A., (Dr. Sadeghi) & Abolghasemi @ UT *2022*
- **Data Analysis**, T.A., (Dr. Sadeghi) @ UT *2021*
- **Neural Networks & Deep Learning** T.A., @UT *2021*
- **Machine Learning**, Head T.A., (Dr. Salimi) *2022*
- **Discrete Mathematics**, Head T.A., (Dr. Ebrahimpour) *2021*
- **Artificial Intelligence**, Head T.A., (Dr. Ebrahimpour) *2020*
- **Matlab Laboratory**, Head T.A., (Dr. Ebrahimpour)@UK *2020*
- **Java Programming**, Teacher, Khayatzade HighSchool *2017*

Selected Academic Projects

- **Deep Learning: Image segmentation using U-Net** *2022*
  - Developed an application for semantic segmentation of images from a self-driving car dataset.
- **Deep Learning: Style Transfer using VGG-19 Model** *2022*
  - Developed an application for Generating images using several given input styles with the Style Transfer method.
- **Deep Learning: Car detection with YOLO** *2022*
  - Developed an application capable of detecting cars in the dataset of street images and drawing a bounding box around them.
- **Deep Learning: Developed a Music Generator Application** *2022*
  - Developed this application using several LSTM layers, and we were able to use it to generate different music genres.
  - We have tried to make it more efficient using different techniques using Delta-RNN, Quantization and etc.
- **Bio Inspired Computing: Designed and Developed several Bio-Inspired tasks** *2021*
  - Developed Genetic Algorithm based problem solver on solving ZOE problem, Particle Swarm Opt. and K-Means based classifier.
  - Developed an application to draw several types of fractal trees and jungle using L-Systems.
  - Developed an Ant Colony Optimization application to solve Vehicle Routing Problem.
- **Machine Learning: Parkinson Disease Classifier** *2021*
  - Designed multiple classifiers based on more than 700 features. (Used 15 different classifiers: KNN, DNN, etc.) (ACC: 98.3%.)
- **Machine Learning: Varzesh3 Website Data Analysis** *2021*
  - Extracted information of the website using a crawler, analyzed and visualized the extracted data.
- **Data Analysis: U.S. Car Accidents Analysis** *2020*
  - Developed application to visualize 'US Accidents' dataset, predicted the most probable time and place for an accident to occur.
- **Deep Learning: Weather Forecasting Application** *2020*
  - Developed models using RNN and LSTMs, achieving approximately 97% accuracy.
- **Deep Learning: German Traffic Sign Classification** *2020*
  - Used CNNs to classify traffic images. (Reached to about 98.5% of Accuracy.)
- **Deep Learning: Build Several GANs** *2020*
  - Constructed models like DCGAN, CGAN, SuperResolution, WGAN, and related models.
- **Software Engineering: Kashan Holiday(Tourist Website)** | *Python, Django, JS, AngularJS, HTML, CSS, etc.* *2018*
  - Developed a website for tourist guidance related tasks such as booking & viewing hotels in a city, historical sites, ...

Work Experience

- **Molavi Carpet: Software Engineer & Board Member** *2015 – Now*
  - Serving as a Server Administrator, overseeing server and network maintenance.
  - Served as the principal leader for the company's website design team, steering its vision and guaranteeing superior design results.
- **TechnoFarsh.ir Startup: Founder & Developer** *2017 – 2020*
  - Founded the coumpany by the base idea of gathering all forms of B2B, C2C and B2C in one place focusing on Carpet industry.
  - Developed an Augmented Reality application for Glasses and Carpets.
  - Established our startup at the University of Kashan Innovation and Commercialization Center.

Selected Online Courses

- **"2023 Oxford Machine Learning Summer School - Health" Certificate** - Offered by OxML *2023*
- **"2023 Oxford Machine Learning Summer School - Finance & NLP" Certificate** - Offered by OxML *2023*
- **"Deep Learning Specialization" Certificate** - Offered by deeplearning.ai *2023*
- **"Professional Neuroscience & Systems course"** - offered by **IPM School of Cognitive Science** *2021 - 2022*
- **"Generative Adversarial Networks (GANs) Specialization" Certificate** - Offered by deeplearning.ai *2022*
- **"Machine Learning" Certificate** - Offered by Stanford *2022*
- **"Deep Neural Networks with PyTorch" Certificate** - Offered by IBM *2021*
- **"Linear Algebra"**, by Gilbert Strang *2020*

Voluntary & Extracurricular Activities

- **"Medium writer"**, Writing about various Computer Science and Deep Learning related topics, **My Profile** *2021 - Now*
- **"YouTube Content Creator"** about various computer science related topics, **Channel Link** *2020 - Now*
- **"Kashan's introduction to neuroscience workshop"**, Member of Executives *2016 - 2018*
- **"University of Kashan Computer Engineering Association (CESS)"**, Member of Executives *2017 - 2018*
- **Enthusiastic about "Pilosophy" and "critical way of thinking".** -

ATTENDED WORKSHOPS

- "**8th Winter Seminar Series (WSS)**" **Certificate** - Offered by Sharif University of Technology *2023*
- "**ReACT 2023**" **Certificate** - Offered by Sharif University of Technology *2023*
- **Scale TransformX 2022** *2022*
- **"How to be a Teaching Assistant" Certificate** - Offered by University of Tehran *2022*
- **"Sixth IPM Advanced School on Computing & Artificial Intelligence" Certificate** *2022*
- **Scale TransformX 2021** *2021*
- **"Fifth IPM Advanced School on Computing & Artificial Intelligence" Certificate** *2021*

References

- **Dr. Mehdi Modarressi**
  - Assistant Professor - University of Tehran
  - modarressi@ut.ac.ir
- **Dr. Javad Salimi Sartakhti**
  - Assistant Professor - University of Kashan
  - salimi@kashanu.ac.ir
- **Dr. MohammadAmin Sadeghi**
  - Assistant Professor - University of Tehran
  - asadeghi@ut.ac.ir
- **Dr. Mostafa Tavassolipour**
  - Assistant Professor - University of Tehran
  - tavassolipour@ut.ac.ir