Hesam Mojtahedi

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Research Interests

- ◇ Machine Learning
- ◇ Optimization
- ◇ Control Theory
- ◇ Reinforcement Learning
- ◇ Deep Learning
- ◇ Distributed Systems

Education

University of California San Diego — **La Jolla, USA**

Ph.D. in Electrical & Computer Engineering (Intelligent Systems, Robotics & Control) — *Sep. 2022 – Present*

Advisor: Prof. Yang Zheng

University of Tehran — **Tehran, Iran**

B.Sc in Electrical Engineering GPA: 18.37/20 — (3.94/4)

Minor in Computer Engineering GPA: 17.4/20 — *Sep. 2017 – Jul. 2022*

Thesis: "**Incentive Mechanism for Reliable Coded Federated Learning**; Applications in distributed edge computation"

Advisor: Prof. Hamed Kebriaei

Shahid Madani High School(NODET) — **Tabriz, Iran**

National Organization for Development of Exceptional Talents — *Sep. 2013 – Jun. 2017*

Mathematics Diploma GPA: 19.88/20

Honors And Awards

- ◇ University of California San Diego Ph.D. fellowship.
- ◇ **Ranked 1st** in control engineering at University of Tehran.
- ◇ Among **top 5%** of students in Electrical Engineering at University of Tehran..
- ◇ Member of the **National Organization for Development of Exceptional Talents (NODET)**

Publications

◇ Milad Soltany Kadarvish*, **Hesam Mojtahedi***, Hossein Entezari Zarch*, Amirhossein Kazerouni*, Alireza Morsali, Azra Abtahi, Farokh Marvasti. Ensemble Neural Representation Networks. *TCAS-II*,-13069-2022 submitted.
(* equal contribution)

◇ Rezaeijo Seyed Masoud, Mohammadreza Ghorvei, Razzagh Abedi-Firouzjah, **Hesam Mojtahedi**, and Hossein Entezari Zarch. Detecting COVID-19 in chest images based on deep transfer learning and machine learning algorithms. *Egyptian Journal of Radiology and Nuclear Medicine*, 2021.

◇ Rezaeijo, Seyed Masoud, **Hesam Mojtahedi**, Hossein Entezari Zarch , Nahid Chegeni, and Amir Danyaei. Feasibility study of synthetic DW-MR images at different b-values in patients with prostate cancer compared with real DW-MR images: qualitative and quantitative assessment of CycleGAN, Pix2PiX, and DC2Anet models. *Applied Magnetic Resonance Journal*, 2022 submitted.

Research Experience

Research Assistant, Scalable Optimization and Control (SOC) Lab — **University of California San Diego**

Supervisor: Prof. Yang Zheng — *Sep. 2022 – present*

Research Assistant, Smart Networks Lab — **University of Tehran**

Supervisor: Prof. Hamed Kebriaei — *Oct. 2021 – Jul. 2022*

- Working on distributed optimization and federated learning tasks in edge computing.

Research Assistant, Multimedia and Signal Processing Lab — **Sharif University of Technology**

Supervisor: Prof. Farokh Marvasti — *Apr. 2021 – Oct. 2021*

- Proposed a network architecture optimization algorithm to find novel ensemble architectures for "Implicit Neural Representations with Periodic Activation Functions" to enhance output image quality and reduce the required FLOPs count for rendering.
- Parallelized the network to train numerous sub-models on a GPU with PyTorch.
- wrote a research paper based on the achieved results.

Research Assistant **Self-employed**
Supervisor: Dr. Seyed Masoud Rezaeijo *Nov. 2020 – Sept. 2021*

- Implemented deep generative models, such as Cycle GAN for domain translation tasks in medical images.
- Gave a hand to write two papers based on the results.

Research Assistant, Computational Modeling & Machine Learning Lab **University of Tehran**
Supervisor: Prof. Babak N. Araabi *Jun. 2020 – Oct. 2020*

- Analysed emotional state impact on human decision making with R programming language.
- Implemented reinforcement models for representing behavioral decisions.
- Prepared different parts of a practical experiment to test subjects.

Research Assistant, Multimedia and Signal Processing Lab **Sharif University of Technology**
Supervisor: Prof. Farokh Marvasti *Apr. 2019 – Mar. 2020*
Attention-based Sparse Generative Language Model for Machine Translation

- Implemented different machine translation models based on RNNs, LSTM, and transformer models like BERT.

Research Intern, Nojan Robotics and Artificial Intelligence **Science & Technology Park, U of Tehran**
Supervisor: Prof. Ahmad Kalhor *Jun. 2020 – Oct. 2020*

- Employed Deep Neural Networks for Object Detection based on YOLO models for sorting edible seeds.
- Implemented an image processing pipeline on an industrial sorting machine that sorts edible seeds like pistachio by their quality. This machine significantly increases the productivity in food supply chain.

TEACHING ASSISTANTSHIP @ UNIVERSITY of TEHRAN

◇ **Neural Networks** Spring & Fall 2020
Instructor: Prof. Ahmad Kalhor

◇ **Linear Control Systems** Fall 2020
Instructor: Prof. Fariba Bahrami

◇ **Mechatronics** Spring 2021
Instructor: Prof. Mehdi Tale Masouleh

◇ **Probability and Statistics** Fall 2020
Instructor: Prof. Behnam Bahrak

◇ **Probability and Statistics** Spring & Fall 2020 & Fall 2019
Instructor: Mohammad-Reza A. Dehaqani

◇ **Convex Optimization** Spring 2022
Instructor: Prof. Arezou Keshavarz

RELATED COURSES (Graduate courses are indicated by †)

◇ **Convex Optimization**† 20/20
Instructor: Dr. Arezou Keshavarz

◇ **Machine Learning Theory**† [Audit]
Instructor: Prof. Mohammad Ali Maddah-Ali

◇ **Linear Control Systems** 19.25/20
Instructor: Prof. Tooraj Abbasian

◇ **Modern Control Systems** 19.5/20
Instructor: Prof. Hamed Kebriaei

◇ **Data Structures** 18.8/20
Instructor: Prof. Fathiyeh Faghih

◇ **Mechatronics** 19/20
Instructor: Prof. Mehdi Tale Masouleh

◇ **Machine Learning**† 20/20
Instructor: Prof. Babak N. Araabi

◇ **Neural Networks and Deep Learning** † 17/20
Instructor: Prof. Ahmad Kalhor

◇ **Linear Algebra** 18.3/20
Instructor: Prof. M. J. Yazdanpanah

◇ **Operational Research** 20/20
Instructor: Dr. Reza Shokri

◇ **Engineering Probability and Statistics** 17.6/20
Instructor: Prof. Mohammad-Reza A. Dehaqani

◇ **Advanced Programming (C++)** 16.8/20
Instructor: Prof. Ramtin khosravi

SKILLS

Programming Languages:
- Proficient in C/C++, Python, Matlab, and Verilog
- Familiar with R,and LaTeX

Softwares and Frameworks:
- Proficient in PyTorch, NumPy, CVX/CVXPY, and scikit-learn
- Familiar with TensorFlow, and ROS

LANAGUAGE

- **English** [Proficient]
  GRE General (Sept. 12, 2021) — **V**: 165 (96%), **Q**: 168 (91%), **AW**: 4 (54%)
  TOEFL iBT (Oct. 03, 2021) — **107/120** (**R**: 30, **L**: 30, **S**: 22, **W**: 25)
- **Turkish** [Native]
- **Persian** [Native]