







Hamidreza Ghasemi Damavandi

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Personal Profile

Experienced Data Scientist with a Ph.D. in Electrical Engineering and over 8 years of expertise in Artificial Intelligence, including Machine Learning, Deep Learning, Natural Language Processing (NLP), Computer Vision, and Large Language Models (LLMs). Demonstrated success in both academic research and industry applications, with a strong focus on LLM-driven innovation, cutting-edge data science, and software engineering best practices.

Professional Experience

- Arizona State University** Tempe, AZ
Principal Data Scientist Dec 2020 - Current
 - Student Persistence Modeling:** Developed machine learning models to predict student persistence. Conducted model interpretability analysis using SHAP to support stakeholder understanding and decision-making.
 - MLOps:** Maintained full end-to-end production pipelines—including model development, deployment, and CI/CD—using Metaflow, AWS SageMaker, Step Functions, Lambda, GitHub, Terraform, and Jenkins, following MLOps best practices.
 - Course Sequencing Optimization:** Designed and implemented an algorithm to optimally sequence students' remaining courses based on constraints such as prerequisites, credit limits, and business rules.
 - Technical Mentorship:** Led training sessions to onboard team members to the production pipeline and development workflows.
- Overstock** Sandy, Utah
Senior Machine Learning Scientist March 2020 - Dec 2020
 - Optimization Framework:** Developed a multi-variate constraint optimization framework using linear and integer programming to allocate discounts optimally for on-sale items.
 - Large-Scale Data Processing:** Handled datasets with millions of rows to mine correlations and support key business decisions. Built high-quality, object-oriented Python scripts, containerized with Docker, and orchestrated with Apache Airflow for production deployment.
- Arizona State University** Tempe, AZ
Postdoctoral Research Associate March 2018 - March 2020
 - Research Problem:** Created machine and deep learning architectures by leveraging scikit-learn and Keras packages to replicate conventional hydrological models.
 - Proposal Writing:** Engaged proactively in both internal and external lab proposal writing sessions.
- EmbodyVR** Redwood City, CA
Data Scientist August 2017 - November 2017
 - Project:** Contributed to the development of novel algorithms for personalizing head-related transfer function (HRTF) using a combination of traditional feature selection methods and machine learning models.
- University of California - Los Angeles** Los Angeles, CA
Postdoctoral Scholar September 2016 - August 2017
 - Research Problem:** Developed machine learning algorithms to forecast the progress of patients with spinal cord injuries throughout the treatment phase.
 - Statistical Analysis:** Utilized diverse statistical methods to extract valuable biological signals from clinical testings.

Education

- University of Iowa** Iowa City, Iowa
M.S. and Ph.D. in Electrical Engineering Aug 2013 - Aug 2016
- University of Tehran** Tehran, Iran
B.S. in Electrical Engineering Aug 2009 - July 2013

Honors and Awards

- NIW Green Card Award:** Received U.S. Permanent Residency via the [National Interest Waiver \(NIW\)](#) based on academic merit.
- Azad University Entrance Exam:** [Ranked 5th](#) nationwide for B.Sc. admission, Summer 2009.
- Public University Entrance Exam:** [Ranked 236th](#) out of 310,000 applicants nationwide for B.Sc. admission, Summer 2009.
- University of Tehran Admission:** Admitted to [ranked 1st](#) university in Iran, Summer 2009.
- Session Chair, AGU 2019:** Convened and chaired a session on Machine Learning Applications in Hydrology at the AGU Fall Meeting, 2019.
- Graduate Research Scholarship:** Awarded full Graduate Research Assistantship at the University of Iowa, 2013.
- Graduate Travel Award:** Received CGRER graduate travel award from the University of Iowa, Spring 2016.
- Research Impact:** Authored/co-authored 20+ publications cited over 200 times across journals, conferences, and abstracts.
- High School Top Rank:** [Ranked 1st](#) at both high school and pre-university level among all students.

Skills Summary

- **Mathematics:** Mathematical modeling, statistical inference, and data analysis.
- **Programming Languages:** Python, MATLAB, R, C/C++, Java, SQL, object-oriented programming.
- **Frameworks & Tools:** PyTorch, TensorFlow, Keras, NLTK, Metaflow, Spark.
- **DevOps & Cloud:** Docker, Jenkins, HPC Clusters, AWS, Git.
- **Soft Skills:** Critical thinking, problem-solving, mentoring (Postdoc experience), teamwork.

Research Interests

- Artificial Intelligence • Large Language Models (LLMs) • Machine Learning (Statistical & Scientific) • Deep Learning • Natural Language Processing (NLP) • Signal & Image Processing • Optimization • Applied Statistics

Relevant Courses

- Machine Learning • Statistical Pattern Recognition • Optimization Techniques • Digital Signal Processing • Knowledge Discovery • Graph Algorithms & Combinatorial Optimization • Information Theory & Coding • Image & Video Compression • Stochastic Processes • Engineering Probability & Statistics • Signals & Systems • Engineering Mathematics

Selected Projects

- **Customized ChatBot Using OpenAI's LLMs:** Developed the end-to-end code to create a customized ChatBot leveraging the OpenAI's LLM models. In particular, I utilized Retrieval-augmented generation (RAG) technique to increase the accuracy of the LLM models. [\[code\]](#)
- **Face Generation:** Built a deep convolutional GAN (generative adversarial network) to generate fake images from real celebrity images as part of the Udacity Deep Learning course. [\[code\]](#)
- **Sentiment Analysis:** Implemented text translation and sentiment analysis using Hugging Face transformers. [\[code\]](#)
- **SLAM:** Implemented Simultaneous Localization and Mapping (SLAM) technique as part of the Udacity Computer Vision course to track the location of a robot in a 2D world in real-time and identify the locations of landmarks such as buildings, trees, rocks. [\[code\]](#)
- **Image Captioning:** Trained a CNN-RNN model to predict captions for a given image as part of the Udacity Computer Vision course. [\[code\]](#)
- **Facial Keypoint Detection:** Trained a Convolutional Neural Network using PyTorch to detect facial keypoint (mouth, nose, eyes) in an image as part of the Udacity Computer Vision course. [\[code\]](#)
- **DNN Speech Recognizer:** Built a deep neural network using PyTorch that functions as an element of an end-to-end automatic speech recognition pipeline as part of the Udacity NLP course. [\[code\]](#)
- **Machine Translation:** Implemented an encoder-decoder network using Recurrent Neural Networks for translating English sentence to French sentence and vice versa as part of the Udacity NLP course. [\[code\]](#)
- **Part of Speech Tagging:** Built a hidden markov model for part of speech tagging as part of the Udacity NLP course. [\[code\]](#)
- **Landmark Classification and Tagging for Social Media:** Built a Deep Convolution Neural Network to classify different landmarks found on social media using PyTorch as part of the Udacity Deep Learning course. [\[code\]](#)

Selected Certifications

- **LLMs & Text Generation (Udacity):** Certificate earned through Udacity's AI Nanodegree program. [\[link\]](#)
- **Generative AI with LLMs (Coursera):** Certificate earned via Coursera. [\[link\]](#)
- **Natural Language Processing (Udacity):** Certificate earned via Udacity. [\[link\]](#)
- **Computer Vision (Udacity):** Certificate earned via Udacity. [\[link\]](#)
- **Deep Learning (Udacity):** Certificate earned via Udacity. [\[link\]](#)
- **AWS ML Specialty:** AWS certification. [\[link\]](#)
- **AWS Cloud Practitioner:** AWS certification. [\[link\]](#)
- **AWS AI Practitioner:** AWS certification. [\[link\]](#)
- **Software Engineering Essentials (Coursera):** Certificate earned via Coursera. [\[link\]](#)