Hamidreza Ghasemi Damavandi

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Personal Profile

Accomplished Machine Learning Engineer with a Ph.D. in Electrical Engineering and over 8 years of experience in Artificial Intelligence, spanning Machine Learning, Deep Learning, Natural Language Processing (NLP), Computer Vision, and Large Language Models (LLMs). Strong foundation in mathematical modeling and statistical analysis, with demonstrated success putting models into production—deploying and maintaining scalable ML systems in industry—alongside impactful academic research. Skilled at bridging advanced data science methodologies with robust software engineering practices to deliver reliable, production-ready AI solutions.

Professional Experience

- **Arizona State University** — Tempe, AZ
  Principal Data Scientist — *Dec 2020 – Current*
  - **Data Science & Machine Learning Initiatives**: Led the group's data science and machine learning efforts, including advanced model development, interpretability using SHAP, and integration into decision-making processes.
  - **Student Prediction Models**: Developed and deployed a daily XGBoost model to predict students' likelihood of persistence, with SHAP-based explanations highlighting key drivers of low persistence, enabling proactive interventions at scale which impacted 100,000+ students.
  - **MLOps**: Designed and maintained full end-to-end production pipelines—including model development, deployment, CI/CD, and monitoring—using Metaflow, AWS SageMaker, Step Functions, Lambda, GitHub, Terraform, and Jenkins. Reduced model deployment time from hours to minutes and ensured 99% pipeline reliability.
  - **Automation**: Automated the entire data science lifecycle—from feature engineering and model training to deployment and monitoring—by integrating Slack notifications and Amazon Q, enabling real-time alerts and reducing incident response time by 50%.
  - **Algorithm Development**: Developed and applied algorithms to optimize HigherEd processes, improving scheduling efficiency by 100%.
  - **Technical Mentorship & Presentations**: Onboarded 3+ new team members through training on production workflows and delivered knowledge-sharing presentations on advanced Machine Learning topics at institutional and external venues, reaching audiences of 50+.
- **Overstock** — Sandy, UT
  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.
- **EmbodyVR** — Redwood City, CA
  Data Scientist — *August 2017 – Nov 2017*
  - **Algorithm Development**: 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.

Postdoctoral Training

- **Arizona State University** — Tempe, AZ
  Postdoctoral Research Associate — *March 2018 – March 2020*
- **University of California - Los Angeles** — Los Angeles, CA
  Postdoctoral Scholar — *September 2016 – August 2017*

Education

- **University of Iowa** — Iowa City, IA
  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

- **Public University Entrance Exam**: Ranked 236^{th} out of 310,000 applicants nationwide for B.Sc. admission, Summer 2009.
- **Azad University Entrance Exam**: Ranked 5^{th} for B.Sc. admission, Summer 2009.
- **University of Tehran Admission**: Admitted to ranked 1^{st} university overall and 2^{nd} in Technology in Iran with a full four-year scholarship, summer 2009.
- **NIW Green Card Award**: Received U.S. Permanent Residency via the National Interest Waiver (NIW) based on academic merit. A US citizen since 2024.
- **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.
- **High School Competition**: Ranked 1^{st} in a comprehensive high school exam among schools in the eastern part of Tehran, Iran, Spring 2009.
- **High School Top Rank**: Ranked 1^{st} at both high school and pre-university level among all students.

Skills Summary

- **Mathematics & Statistics**: Mathematical modeling, statistical inference, data analysis, and optimization.
- **Programming Languages**: Python, MATLAB, R, C/C++, Java, SQL; strong foundation in object-oriented and functional programming.
- **Machine Learning**: Supervised and unsupervised learning, deep learning, natural language processing (NLP), computer vision, large language models (LLMs), feature engineering, model evaluation, and interpretability.
- **Frameworks & Libraries**: PyTorch, TensorFlow, Keras, Apache Spark, NumPy, Pandas, Scikit-learn.
- **MLOps & Workflow Orchestration**: Metaflow, Airflow; model deployment, monitoring, CI/CD, and experiment tracking.
- **Systems & Cloud Computing**: Docker, Jenkins, Amazon Web Services, Terraform, HPC clusters, Linux, Git/GitHub.
- **Collaboration & Leadership**: Critical thinking, problem-solving, mentorship (Postdoc experience), effective communication, and teamwork.

Research Interests

• Artificial Intelligence • Machine Learning (Statistical & Scientific) • Deep Learning • Natural Language Processing
• Large Language Models • 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 & 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

- **Johns Hopkins Certificate Program in Applied Generative AI**: Certificate program is in progress.
- **NVIDIA-Certified Associate: Generative AI/LLMs.**: Nvidia certification [link]
- **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]
- **Data Structure and Algorithms (ASU)**: Certificate earned via ASU CareerCatalyst. [link]