Hamidreza Ghasemi Damavandi

Personal Page
Github
LinkedIn

hamidghasemi69@gmail.com
+1-319-471-5953
Green Card
rdamavandi69

Personal Profile

A passionate research data scientist possessing a Ph.D. in Electrical Engineering with expertise across different areas of artificial intelligence such as Machine Learning, Deep Learning, Natural Language Processing and Computer Vision with +7 years of experience researching and working in the field. Dedicated to keep abreast of the state-of-the-art developments and technologies utilized both in the data science and software engineering areas.

Professional Experience

- **Arizona State University** — Tempe, AZ
  Principal Data Scientist — *Dec 2020 - Current*
  - **Promotion**: Senior Data Scientist from December 2020 to October 2022, promoted to Principal Data Scientist on October 2022.
  - **Project**: Developing machine learning models to predict the student persistence via a multi-tude of predictors using miscellaneous machine learning models such as XGBoost, Logistic Regression and performing the model interpretability analysis using Shapley Additive exPlanations (SHAP) for a better understanding of the machine learning model.
  - **MLOps**: Maintaining the full end-to-end production pipeline from model development to model deployment as well as the CI-CD pipeline using Metaflow, AWS SageMaker, Step Functions, Lambda, GitHub, Terraform, Jenkins with MLOps principals.
  - **Training Sessions**: Conducting training sessions for the team members to get familiar with the production pipeline.
- **Overstock** — Sandy, Utah
  Senior Machine Learning Scientist — *March 2020 - Dec 2020*
  - **Project**: Devised an optimization framework for optimal discount allocation of on-sale items using multi-variate constraint optimization techniques via linear and integer programming.
  - **Big Data Scenario**: Worked with tables with millions of rows including querying, filtering and mining the data towards finding the correlation between the fields with an end-goal of defining a business problem. Moreover, Wrote high-quality object-oriented Python scripts, containarized using Docker and scheduled for production using Apache Airflow.
- **Arizona State University** — Tempe, AZ
  Postdoctoral Research Associate — *March 2018 - March 2020*
  - **Research Problem**: Developed machine and deep learning architectures to emulate the conventional hydrological models using scikit-learn and Keras packages.
  - **Proposal Writing**: Actively participated in internal and external proposal writing sessions of the lab.
- **EmbodyVR** — Redwood City, CA
  Data Scientist — *August 2017 - November 2017*
  - **Project**: Pioneered novel algorithms for head-related transfer function (HRTF) personalization using traditional feature selection methods as well as machine learning models.
- **University of California - Los Angeles** — Los Angeles, CA
  Postdoctoral Scholar — *September 2016 - August 2017*
  - **Research Problem**: Devised machine learning-based algorithms to predict the improvement of spinal cord injury patients during the treatment phase.
  - **Statistical Analysis**: Applied miscellaneous statistical methods to extract the informative biological signals out of clinical testings.

Education

- **University of Iowa** — Iowa City, Iowa
  PhD in Electrical Engineering; GPA: 3.89 — *Aug 2013 - Aug 2016*
- **University of Iowa** — Iowa City, Iowa
  Masters in Electrical Engineering; GPA: 3.89 — *Aug 2013 - July 2016*
- **University of Tehran** — Tehran, Iran
  Bachelors in Electrical Engineering; GPA: $\sim$ 3.4 — *Aug 2009 - July 2013*

Skills Summary

- **Mathematics**: Advanced mathematical & statistical skills.
- **Languages**: Python, MATLAB, R, C/C++, Java, SQL, Object-oriented Programming.
- **Tools**: Docker, PyTorch, TensorFlow, Keras, Metaflow, Jenkins, Spark, HPC Clusters, Amazon Web Services, Git, NLTK Package.
- **Soft Skills**: Critical Thinking, Problem-solving, Mentoring skills during Postdoc positions, Teamwork.

Research Interest

• Artificial Intelligence • Statistical Machine Learning • Scientific Machine Learning • Deep Learning • Natural Language Processing • Signal Processing • Image Processing • Optimization

Selected Projects

- **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]

Honors and Awards

- Received Green Card through National Interest Waiver (NIW) due to exceptional abilities in the field of science.
- Ranked 5^{th} in the nation-wide Azad university entrance exam for Bachelor of Science, summer 2009.
- Ranked 236^{th} among 450000 in the nation-wide public university entrance exam for Bachelor of Science, summer 2009.
- Admitted to the University of Tehran, ranked 1^{st} school in Iran with a four-year scholarship, summer 2009.
- Served as a convener and chair in a session of Machine Learning applications of Hydrology, AGU 2019.
- Full Graduate Research Assistantship scholarship, University of Iowa, 2013.
- CGRER graduate travel award, university of Iowa, spring 2016.
- Authored & co-authored more than 20 publications (journal, conference and abstract) cited +100 times.
- Ranked 1^{st} at high school and pre-university program among all students.

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

Teaching Experience

- Linear System I, University of Iowa, Spring 2015.
- Digital Signal Processing, University of Tehran, Fall 2012.
- Engineering Probability & Statistics, University of Tehran, Fall 2012.

Selected Certifications

- **Natural Language Processing**: Earned through Udacity learning portal. [link]
- **Computer Vision**: Earned through Udacity learning portal. [link]
- **Deep Learning**: Earned through Udacity learning portal. [link]
- **AWS Cloud Practitioner**: Earned through Amazon Web Services certification exam. [link]
- **AWS Machine Learning Speciality**: Earned through Amazon Web Services certification exam. [link]
- **Software Engineering Essentials**: Earned through Coursera Learning portal. [link]

Selected Publications

- **Using Satellite Remote Sensing and Machine Learning Techniques Towards Precipitation Prediction and Vegetation Classification [Journal of Environmental Informatics 2019 - Impact Factor: 10.22]**: Dimitrios Stampoulis Stampoulis, **Hamidreza Ghasemi Damavandi** , Dragan Boscovic, and John Sabo.
- **A Bayesian Neural Network for an Accurate Representation and Transformation of Runoff Dynamics: A Case Study of the Brazos River Basin in Texas. [Journal of Environmental Science and Engineering Technology 2020]** : **Hamidreza Ghasemi Damavandi**, Dimitrios Stampoulis, John Sabo1,Reepal Shah, Li Huang, Yuhang Wei, Yushiou Tsai, Jaishri Srinivasan, Tushar Sinha, Dragan Boscovic, and Glen Low.
- **Machine Learning Classifes Predictive Kinematic Features in a Mouse Model of Neurodegeneration[Scientific Reports 2021 - Impact Factor: 4.997]**: Ruyi Huang, Ali A. Nikooyan, Bo Xu, M. Selvan Joseph, **Hamidreza Ghasemi Damavand**, Nathan von Trotha, Lilian Li, Ashok Bhattarai, Deeba Zadeh, Yeji Seo, Xingquan Liu, PatrickA.Truong, Edward H. Koo, J. C. Leiter , Daniel C. Lu.
- **Real-time monitoring and prediction of water quality parameters and algae concentrations using microbial potentiometric sensor signals and machine learning tools[Science of The Total Environment 2021]**: Daniel Saboe, **Hamidreza Ghasemi Damavandi**, Ming Ming Gao, Mirjana Samardzic, Kiril D. Hristovski, Dragan Boscovic, Scott R. Burge, Russell G. Burge, David A. Hoffman.
- **An Active Learning Based Prediction of Epidural Stimulation Outcome in Spinal Cord Injury Patients Using Dynamic Sample weighting[ICHI 2017]**: Mohammad Kachuee, Lisa D. Moore, Tali Homsey, **Hamidreza Ghasemi Damavandi**, Babak Moatamed, Anahita Hosseini, Ruyi Huang, James Leiter, Daniel C. Lu, Majid Sarrafzadeh
- **Interpreting Comprehensive Two-dimensional Gas Chromatography Using Peak Topography Maps with Application to Petroleum Forensics[Chemistry Central Journal 2016]**: **Hamidreza Ghasemi Damavandi**, Ananya Sen Gupta, Robert K. Nelson, Christopher M. Reddy.