Amirreza Ghasemi

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Summary

Experienced Machine Learning Engineer with a proven track record in developing computer vision and natural language processing (NLP) models and applications. Hold professional certificates in machine learning, software engineering, and cloud computing from AWS, Google, and Meta. Skilled in solving complex challenges and delivering high-quality work in a fast-paced environment. Strong problem-solving and communication skills. Passionate about using AI to make a positive impact on people's lives and the world.

Skills & Certificates

Computer Skills

- **Fundamental Programming Languages**: Python, C++, MATLAB, SQL, C, FORTRAN, CUDA
- **Web Development**: HTML, CSS, JavaScript, Node.js, Next.js, Flask, Django
- **Mobile App Development**: Swift, React Native
- **Other**: TensorFlow, PyTorch, Keras, Scikit-Learn, Amazon Web Service, Google Cloud, Docker, Kubernetes

Certificates

- **Google**: TensorFlow Developer Certificate
- **Amazon Web Services**: AWS Certified Machine Learning - Specialty, AWS Certified DevOps Engineer - Associate, AWS Certified Solutions Architect - Associate, AWS Certified Cloud Practitioner (CLF)
- **Meta**: Meta Back-End Developer, Meta Front-End Developer
- **DeepLearning.AI**: Practical Data Science on the AWS Cloud Specialization, Deep Learning Specialization
- **Coursera**: Visual Perception for Self-Driving Cars, Reinforcement Learning Specialization, Recommender Systems Specialization, Computational Neuroscience, IBM AI Engineering, IBM Data Science

Professional Experience

sovaSage Inc. *Remote*

Machine Learning Engineer *Jan 2021 - Present*

- Created computer vision models using Convolutional Neural Networks (CNNs) and Transformers for tasks including human face detection, facial feature recognition, custom keypoint identification, and pose estimation.
- Optimized the entire workflow, encompassing model construction, training, and deployment, on AWS SageMaker, resulting in enhanced MLOps pipeline efficiency and performance.
- Enhanced model performance during inference by optimizing trained models.
- Successfully built, trained and deployed Natural Language Processing (NLP) models for a chatbot system by fine-tuning Large Language Models (LLMs), resulting in improved accuracy and efficiency of the chatbot system.
- Developed application backend code, integrating machine learning models into the application and ensuring scalability and performance.
- Developed and implemented a comprehensive suite of unit tests for the application backend code, resulting in significant improvements in code quality and ensuring the ongoing functionality of the application.
- Played a pivotal role in the growth and success of the company by providing expert guidance and executing cutting-edge machine learning strategies that enabled the company to transition from the early-stage to venture-funded stage.

Saint Anthony Falls Laboratory *Minneapolis*

Postdoctoral Associate *June 2020 - Jan 2021*

- Designed and conducted experimental research to develop a tailings management technology for oil companies in Canada, optimizing its performance while adhering to industry standards and regulations.

Research Assistant *September 2016 - May 2020*

- Improved the current understanding of fluid-particle interactions in rivers through the development of a probabilistic framework. Adopted and improved an existing FORTRAN code to simulate multi-phase flows with high-performance computing algorithms.
- Developed a digital image processing algorithm using Hough Transform in MATLAB to detect and track the motion of particles.
- Improved image quality for particle tracking purposes by applying a low-pass and high-pass filters in MATLAB and Python to better distinguish particles from background.

University of Minnesota *Minneapolis*

Teaching Assistant *September 2016 - May 2020*

- Taught +150 students in 5 sections of fluid mechanics laboratory.
- Trained 2 graduate students as the potential future teaching assistants.

Business Consultant Intern *June 2018 - August 2018*

- Advised a health insurance company about entering the "end of life care" market by performing market and clinical research.

Business Consultant Intern *September 2017 - December 2017*

- Advised one of the top 3 single-family home property management companies in the U.S. about the main reasons for their client churn.

University of Kentucky *Lexington*

Research and Teaching Assistant *September 2014 - June 2016*

- Performed experimental studies to characterize turbulent flows in rivers that are responsible for sediment transports.
- Improved signal quality by performing proper orthogonal decomposition (POD) to remove noises at high frequencies.

Personal Projects

Sorting Hat Faceoff: Unveiling Your Wizarding Team *Python, OpenCV, LangChain, Emotion Recognition, Chatbot, NLP*

- Built a Streamlit web application that captures a user's live webcam feed, detects facial emotions, and engages the user in a series of questions inspired by the Sorting Hat from Harry Potter to determine their team affiliation.

Real-Time Object Detection & Tracking with MMDetection *MMDetection, Object Detection and Tracking, Transformers*

- Designed a Streamlit web application utilizing Open-mmlab MMDetection for real-time object detection and tracking.

Real-Time Plate Recognition & Tracking *YOLONAS, Optical Character Recognition, Object Tracking, OpenCV*

- Created a real-time system for license plate recognition and tracking using YOLONAS and EasyOCR.

MediaPipe WebApp *MediaPipe, Object Detection, Selfie Segmentation, Image Stylization, Face Landmark Detection*

- Created a web application using MediaPipe and Streamlit, enabling the execution of diverse computer vision tasks.

Potterize Me *Image Embedding, Image Similarity, MediaPipe, Streamlit*

- Designed and implemented a captivating web application using MediaPipe and Streamlit, where users can discover their matching character in the magical world of Harry Potter based on their facial features.

Image Captioning *Multi-model Learning, Transformers, TensorFlow, Keras3*

- Developed an image-to-text model using TensorFlow to generate descriptive captions for input images.

Multi-task Image Segmentation & Depth Estimation *Multi-task Learning, Segmentation, Monocular depth estimation*

- Developed a multi-task model, leveraging state-of-the-art techniques, to perform image segmentation and depth estimation.

Image Processing WebApp *C++, Python, OpenCV, Streamlit*

- Developed a streamlit WebApp in Python that performs image processing using OpenCV and C++ as backend code.

Education

University of Minnesota *Minneapolis*

PhD in Civil Engineering (GPA: 4.0) *September 2016 - May 2020*

- A Study of Particle Entrainment in Two Common Particle-Fluid Flows in Nature: Bedload Transport in Rivers and Debris Flows in Upland Regions.

University of Kentucky *Lexington*

M.Sc in Civil Engineering (GPA: 3.88) *September 2014 - June 2016*

- Study of Macroturbulence and bursting via the -1 spectral power law region of turbulent open channel flows over gravel beds.

Sharif University of Technology *Tehran*

B.Sc in Civil Engineering (GPA: 3.26) *September 2010 - June 2014*

Honors and Awards

Alvin G. Anderson award , given each year to one student with outstanding records pursuing water resources at the University of Minnesota. *University of Minnesota, 2020*

Abbas Ali and Mrs. Rowshan K. Daneshy fellowship, given to top Iranian students in science and engineering fields at the University of Minnesota. *University of Minnesota, 2019*

Travel Grant , awarded by the Civil Engineering department to attend American Geophysical Union conference. *University of Minnesota, 2018*

Travel Grant , awarded by the Civil Engineering department to attend American Geophysical Union conference. *University of Minnesota, 2017*

Ranked top 0.05% (122 out of $\sim$ 460,000) , Public Universities Entrance Exam *Iran, 2010*

Semi finalist, Physics Olympiad *Iran, 2009*

Finalist, Laboratory competition *Mashhad, Iran, 2009*