Javid Akhavan

Data Scientist · Machine Learning Engineer

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Professional Experiences

Computer Vision Engineer and Researcher, **Stevens Institute of Technology** — Aug 2019 – present

- Engineered a Vision-Transformer-based motion tracking algorithm for interpreting acoustic emission data from a robotic manipulator head, achieving real-time tracking with **±0.1** mm accuracy.
- Developed a MATLAB-based labeling assistant dashboard, streamlining database creation and reducing manual effort by **10×**.
- Optimized a TensorFlow deep learning model for melt pool image processing, cutting data processing time from **120** seconds to under **1** second.
- Applied Hybrid Convolutional Autoencoder-Decoders for point cloud and image feature extraction, enabling autonomous anomaly detection with 98% accuracy.
- Designed a reinforcement learning-based controller in TensorFlow for real-time anomaly detection and fault mitigation; patent pending.
- Built a multi-language command exchange system (Python, MATLAB, C#) for seamless API synchronization and automation.
- Worked extensively with sensors and acquisition modules, including cameras, laser surface profilometers, LiDAR, and acoustic emission readers.

Software Engineer Intern, **Johnson and Johnson (J&J)** — May 2023 – Aug 2023

- Engineered an interactive web-based financial and budget visualization dashboard using Dash Plotly and RESTful APIs, delivering real-time insights, and improving decision-making for the Business Intelligence team.
- Implemented ODBC connections to Teradata and Denodo data lakes, enabling seamless live data integration for real-time, on-demand corporate data visualization, improving reporting speed and accuracy.
- Developed and deployed a secure, scalable Azure-integrated web application for automated database synchronization and SharePoint backend integration, optimizing data aggregation and reporting while ensuring confidentiality of sensitive data and compliance with privacy and security standards for online RTF-to-PDF conversion.
- Collaborated in an Agile environment using Git, SQL, and Bitbucket, ensuring efficient version control and continuous integration of software solutions.

Virtual Reality Programmer and Research Intern, **Dr. Robot** — Jan 2018 – May 2019

- Secured **$8,000** in funding and laid the foundation for a start-up by designing and implementing an automated irrigation system.
- Led project management efforts, including software design, model fabrication, testing, and documentation to ensure timely and efficient delivery.
- Created a MATLAB-based auto-grading application, streamlining homework grading across various domains, contributing to the success of a start-up.
- Managed Virtual Reality (VR) equipment setup and synchronized with auxiliary sensors and devices to optimize user experiences.
- Developed and tested **10** interactive VR-based applications in Unity-3D for training and evaluating pronunciation skills in children aged **7–10**, with successful field trials involving **58** participants.
- Built automation libraries for tasks like text-to-speech conversion, animation creation, scenario compilation, and console-VR synchronization using C#, Java, and Python.

Education

- **Doctor of Philosophy (Ph.D.)** in Artificial Intelligence & Robotics
  Stevens Institute of Technology, Hoboken, NJ — Dec 2022 – Expected May 2025
  - Focus: Machine Learning, Computer Vision, and Robotics
  - Dissertation: Advanced AI Models for Real-Time Quality Control and Anomaly Detection in Additive Manufacturing
- **Master of Engineering (M.Eng.)** in Artificial Intelligence & Robotics
  Stevens Institute of Technology, Hoboken, NJ — Aug 2019 – Dec 2022
  - Focus: Deep Learning Applications in Computer Vision and Process Optimization

Technical Skills

- Proficient in Python, with advanced work experience
- Intermediate experience in SQL and Tableau
- Intermediate experience in Web-App development using Dash Plotly
- Proficient in MATLAB & Simulink, with advanced work experience.
- Proficient in TensorFlow, with advanced work experience
- Familiar with Unity and Steam Virtual Reality
- Intermediate experience in C++/C#

Certifications

Graduate Certificate in Machine Learning	Stevens Institute of Technology, Hoboken, NJ
Fundamentals of Reinforcement Learning	University of Alberta
HSE (Health, Safety, and Environment)	IORC
Custom Models, Layers, and Loss Functions with TensorFlow	DeepLearning.AI

Selected Publications

Binocular Model: A deep learning solution for online temperature analysis using dual-wavelength Imaging Pyrometry	JIMS 2024
Real-Time Print Tracking In Metal Additive Manufacturing Using Acoustic Emission Sensors And Vision Transformer Algorithms	MSEC 2024
TDIP: Tunable Deep Image Processing, a Real Time Melt Pool Monitoring Solution	IPCV 2023
Real-time monitoring and Gaussian process-based estimation of the melt pool profile in direct energy deposition	ASME-MSEC 2023
A deep learning solution for real-time quality assessment and control in additive manufacturing using point cloud data	JIMS 2023
In-situ laser-based process monitoring and in-plane surface anomaly identification for AM using point cloud & ML.	ASME- IDETC&CI 2021
Sensory Data Fusion Using ML Methods for In-Situ Defect Registration In Additive Manufacturing: A Review.	IEMTRONICS 2022
Image-based dataset of artifact surfaces fabricated by additive manufacturing with applications in ML.	Data in Brief 2022