

Amir Behbahanian

Salt Lake City, UT, 84124

Software Engineer | Machine Learning Model Developer | Expertise in Semantic Segmentation and Time-Series

EXPERIENCE

SOFTWARE ENGINEER

Oct 2022 - Present

T.D. Williamson

- * Developed and deployed an LSTM model to detect Failed Sensors. Development was in PyTorch and Deployment was in C++.
- * Developed and deployed a computer vision model to detect pipeline components. The final model had recall and precision of 90% and 77%, respectively. Deployed the model into TDW's on prem cloud.
- * Frequently responded to change and fix requests entailing debugging and coding both in C++ and Python.
- * Prepared an academic paper based on the project for ICMA 2023 and will present the work in the conference.

POSTDOCTORAL RESEARCHER

Dec 2021 - Aug 2022

TEXAS A&M UNIVERSITY

- * Defined the project steps with the project Principal Investigators to accomplish the proposed objectives of a 1.7-million-dollar project and lead a team of three Ph.D. students to accomplish the steps.
- * Led a team of 3 Ph.D. students to achieve the steps of the project.
- * Developed an advanced machine learning model, CatBoost, to predict material properties with 94% R2-score, enabling the creation of surrogate models for optimizing material design procedures.
- * Published the work in the journal of computational material science and presented the scope of the project in the 2022 NSF Material Genome Initiative (NSF-MGI) Principal Investigators Meeting.

MODELING SCIENTIST - INTERN

Jun 2021 - Dec 2021

TOKYO ELECTRON US

- * Employed hard-coded Finite Element Analysis for quantitative modeling of chemical reactions, complemented by machine learning clustering techniques for enhanced data signal processing and remove noise from the signal.
- * Conducted comprehensive post-processing and visualization of simulation data using Python libraries, such as Pandas, NumPy, Matplotlib, and Seaborn.
- * Presented the final work to the Engineering Division and received an extremely positive response.

GRADUATE RESEARCH ASSISTANT

Aug 2016 - Jun 2021

UTAH STATE UNIVERSITY

- * Conducted rigorous uncertainty calculations using Taylor Series and Monte Carlo Method, yielding valuable insights for decision-making.
- * Analyzed an extensive 2 Tb dataset, created by simulations, through the utilization of quantitative analytical modeling and statistical analysis using Python libraries, including Pandas, NumPy, and SciPy.
- * Leveraged the Python Multiprocessing library to optimize computational performance on a High-Performance Computing platform.
- * Presented the result of my work in two different conferences and published 6 scholarly articles.

DATA ANALYST

Mar 2012 - Dec 2015

IRAN HOST

- * Performed Statistical Analysis using MATLAB on user data to plan campaigns, sale events, and user specific promotions.
- * To perform the analysis used Fourier Transform to remove seasonality and extract important information from time series data.

EDUCATION

Ph.D. in Mechanical Engineering

2021

Utah State University

BS in Mechanical Engineering

2012

Sharif University of Technology

SKILLS

Python, C++, HTML, Scikit Learn, PyTorch, TensorFlow, PyTorch Lightning, AZURE, AWS, CUDA, Git, SVN, Jenkins, PySpark, XGBoost, LightGBM, CatBoost, Feature Importance (SHAP), Frequency Analysis, Bayesian Optimization, BoTorch, Optuna

LICENSES & CERTIFICATIONS

Data Science

2022

The Data Incubator

Stochastic processes

2020

Coursera

HONORS & AWARDS

Outstanding Doctoral Student Researcher

2019

Utah State University

Publications

Computer Science Related

- **Behbahanian, A.**, R. Lundstrom, A Belanger, P Dalfonso, R Coleman. (2023) PIPENet: A Semantic Segmentation Approach to Pipeline Component Detection from Magnetic Flux Leakage Readings. *International Conference on Machine Learning and Applications (ICMLA)*.
- Zadeh, S. H., **Behbahanian, A.** (Co-First Author), Broucek, J., Fan, M., Vazquez, G., Noroozi, M., ... & Arroyave, R. (2023). An interpretable boosting-based predictive model for transformation temperatures of shape memory alloys. *Computational Materials Science*, 226, 112225.

Other Publications

- Cutler, R. A., Hui, C., Knudson, L., **Behbahanian, A.**, Beatty, S., Risbud, S., ... & Prebys, E. (2023). Effect of ionizing radiation on thermal and mechanical properties of filled-epoxy adhesives. *International Journal of Adhesion and Adhesives*, 127, 103496.
- **Behbahanian, A.**, Roberts, N., & Larkin, J. (2022). Characterization of temperature-induced randomness in the dynamics of vibration. In *APS March Meeting Abstracts* (Vol. 2022, pp. A12-007).
- **Behbahanian, A.**, & Roberts, N. A. (2021). Phonon wave-packet simulations using the quantized definition of energy and a temperature-dependent phonon dispersion relation and phonon density of states. *Physical Review E*, 103(4), 043311.
- **Behbahanian, A.** (2021). *Characteristic of the Dynamics of Disorder in Crystalline and Amorphous Materials* (Doctoral dissertation, Utah State University).
- Zhang, D., **Behbahanian, A.**, & Roberts, N. A. (2020). Thermal Conductivity Measurement of Supported Thin Film Materials Using the 3-omega method. *arXiv preprint arXiv:2007.00087*.
- **Behbahanian, A.**, & Roberts, N. A. (2019). Large Area Substrate-Based Nanofabrication of Controllable and Customizable Gold Nanoparticles Via Capped Dewetting. *JoVE (Journal of Visualized Experiments)*, (144), e58827.
- White, B. C., **Behbahanian, A.**, Stoker, T. M., Fowlkes, J. D., Hartnett, C., Rack, P. D., & Roberts, N. A. (2018). The effect of different thickness alumina capping layers on the final morphology of dewet thin Ni films. *Applied Physics A*, 124, 1-7.
- Pepper, B., **Behbahanian, A.**, & Roberts, N. (2021). Open Source Software Problems in Heat Transfer to Explore Assumptions and Models.
- **Behbahanian, A.**, Davis, E. L., & Roberts, N. A. (2018, June). Open educational resources in the undergraduate engineering curriculum: A materials science case study. In *2018 ASEE Annual Conference & Exposition*.