Michael Alverson

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EDUCATION

University of Southern California (USC), Viterbi School of Engineering — Los Angeles, CA
Honors Master of Science in Computer Science — *January 2022 – August 2023*
- **GPA:** 4.00

University of Utah, College of Engineering — Salt Lake City, UT
Honors Bachelor of Science in Mechanical Engineering, Computer Science Minor — *August 2017 – May 2021*
- **GPA:** 3.99 *summa cum laude*

EXPERIENCE

Google - Gemini — Mountain View, CA
Software Engineer — *August 2023 – Present*

Google - Play — Mountain View, CA
Software Engineering Intern — *May 2022 – August 2022*
- Designed and implemented a machine learning-based extension to ProdSentry, an anomaly detection system that continually monitors the metrics on the Google Play Server Stack and automatically reports on server disruptions
- Trained and evaluated over 50 time-series forecasting models on server metric data, the best of which was capable of predicting 90 minutes into the future with an average error of less than 2%

Google - Assistant — Los Angeles, CA
Software Engineering Intern — *August 2021 – December 2021*
- Created software pipeline for generating synthetic semantic parsing training data for Seq2Seq models representing Google Assistant in low-data environments using Google's Transformer-based large language model, LaMDA
- Using 15 showcase examples or less per dataset, constrained decoding, and LaMDA's few-shot learning capabilities, successfully generated 20 full semantic parsing training sets comprising over 300,000 examples

University of Utah Sparks Research Group — Salt Lake City, UT
Machine Learning Research Assistant — *August 2020 – December 2023*
- Developed several deep learning-based generative models such as Generative Adversarial Networks (GANs), Wasserstein GANs, and Denoising Diffusion Probabilistic Models for the discovery of novel crystal structures
- Presented work at the 152nd Annual Meeting of TMS in March 2023 and the 63rd EMC in June 2021

Northrop Grumman Space Systems — Bacchus, UT
Propulsion Systems Technical Intern — *May 2020 – August 2020*
- Documented testing results for a motor initiation system to be used in NASA's Space Launch System on Artemis III
- Performed statistical analysis on change report life cycles across 25 programs to identify systemic departmental issues that prevent the efficient distribution of information

SLAC National Accelerator Laboratory — Menlo Park, CA
Science Undergraduate Laboratory Intern — *June 2019 – August 2019*
- Utilized electron beam data from plasma wakefield acceleration simulations to create optimization systems capable of locating an electron beam's longitudinal phase space using neural networks constructed in Python with TensorFlow
- Reduced convergence runtime from several hours in previous optimization attempts to approximately 0.1 seconds

PUBLICATIONS

- **M. Alverson**, et al. (2023) *Generative adversarial networks and diffusion models in material discovery.* Digital Discovery, 3(1), 62-80, https://doi.org/10.1039/D3DD00137G
- S. Baird, K. Jablonka, **M. Alverson**, et al. (2022) *xtal2png: A Python package for representing crystal structure as PNG files.* Journal of Open Source Software, 7(76), 4528, https://doi.org/10.21105/joss.04528
- C. Emma, A. Edelen, **M. Alverson**, et al. (2019) *Machine Learning-Based Longitudinal Phase Space Prediction of Two-Bunch Operation at FACET-II.* Proceedings of the 8th International Beam Instrumentation Conference 2019, IBIC2019, Sweden. doi:10.18429/JACOW-IBIC2019-THBO01

PROJECTS

- Awarded first place in the 2021 Itherm Heat Sink Design Challenge for designing and optimizing an aluminum additively manufactured heat sink that was analyzed using computational fluid dynamics simulations in COMSOL

LEADERSHIP

- USC Viterbi School of Engineering: Introduction to Programming Systems (CSCI455x) Teaching Assistant
- Yellow for Life Suicide Awareness Club: Co-Founder & Former Vice President