Alex L. Wang

Website

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Education

- **Stanford University** — Stanford, CA
  Mathematics & Computer Science — *June 2026*

Experience

- **MITRE** — Bedford, MA
  Software Engineering Intern — *Jun. 2024 - Aug. 2024*
  - Intern in Distributed Systems department working developing the Waveform Analysis Toolbox in collaboration with sponsors, United States Special Operations Command and DOD CIO.
  - Developed a modular code package in Python and C/C++ for calculation and visualization of detection radius of modulated RF signals for LPD/LPI applying estimation theory. Geolocation analysis using theoretical bounds (Cramer-Rao) and IQ algorithms.
- **Stanford Biocomputation Ron Dror Lab** — Stanford, CA
  Student Researcher — *Jan. 2024 - present*
  - Student researcher working under professor Ron Dror and Post-Doc Carl-Mikael Suomivuori in building molecular dynamic simulations for discovering binding targets of Serotonin receptors.
  - Analyzing large-scale MD simulations, using WESTPA2 methods, for application to serotonin receptors to further understand the binding of psychedelic substances.
- **Air Force Research Laboratory** — Dayton, Ohio
  ML/AI Researcher — *June 2023 - Sep. 2023*
  - Used a statistical mechanical approach to simulated polymer physics, improving performance of Markov Chain Monte Carlo (MCMC) detection of phase transitions.
  - Utilized UMAP for feature extraction of MCMC data and Pytorch and TensorFlow frameworks for anomaly detection increasing accuracy rate by 15%.
  - Created genetic algorithm for polymer structure optimization in Python/Julia as a mechanism for discovering potential targets within polymer subspace.
- **Massachusetts Institute of Technology** — Boston, MA
  Engineering Research Intern — *June 2022 - Aug. 2022*
  - Student researcher under Professor Ariel Furst, conducting electrochemistry research for affordable diagnostics.
  - Gained experience with MATLAB and laboratory techniques such as Cyclic Voltammetry, Square Wave Voltammetry, LAMP, CRISPR-Cas12a Assay.
  - Designed & tested spatially multiplexed gold-leaf electrodes for tuberculosis detection with total construction costs under $3. Currently patent-pending with MIT Technology & Licensing Office.

Projects

- **Enhancing AI Creativity: A Multi-Agent Approach to Flash Fiction Generation with Small Open-Source Models**: Building multi-agentic LLM pipelines to improve creative output generation with open-source models.
- **Monomer-Monomer Interactions in Dielectric Polymer Chains Induce Bending Stiffness**: Project conducted using data science and AI techniques to analyze Monte Carlo Markov Chain results for extended polymers.
- **In Silico Assessment of Macrocyclic Host-Guest Ion-Dipole Interactions with Anionic Pores**: Project using computational chemistry software to understand Host-Guest Interactions in charged macrocyclic compounds.

Awards

- **American Chemical Society**
  Top 20 Student (of 16,000) in the United States National Chemistry Olympiad, team Alpha Xi — *2021*
- **Stanford Association for Computing Machinery**
  Overall (Model and Paper) Winner of Computer Vision Project Competition. — *2023*

Programming Skills

- **Languages**: Python (Tensorflow + Pytorch Frameworks), C/C++, Julia, MATLAB **Software**:Avogadro