

Terrence Alsup

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Experience

Morgan Stanley

Vice President, Machine Learning Researcher

New York, NY

05/2025 – Present

Finastra

Senior Data Scientist

Remote

12/2023 – 05/2025

- Partnered with the Chief AI Officer to establish Finastra's AI strategy
- Developed ReAct agent with LangGraph for natural language driven data analytics platform
- Product support ticket clustering with TF-IDF embeddings and HDB-SCAN to identify candidates for knowledge article creation

Data Scientist

02/2022 – 11/2023

- Developed a multi-horizon churn prediction model for bank customers using XGBoost and isotonic regression
- Improved fidelity of StyleTTS2, an open-source diffusion-based text-to-speech model, for narration in product training videos

Sandia National Laboratories

Computer Science Research Institute Intern

Remote

06/2021 – 09/2021

- Worked with Tommie Catanach on applications of Bayesian optimal experimental design to sensor configuration for seismic monitoring
- Developed a method for estimating the error in expected information gain estimates

Education

Courant Institute of Mathematical Sciences, New York University

Ph.D. Mathematics

Advisor: Benjamin Peherstorfer

Thesis: *Trading Off Deterministic Approximations and Sampling in Multi-fidelity Bayesian Inference*

New York, NY

09/2017 – 01/2023

Georgia Institute of Technology

M.S. Mathematics

B.S. Applied Mathematics

Atlanta, GA

01/2017 – 08/2017

09/2013 – 12/2016

Technical Skills

Programming Languages

Python, Matlab, Q, SQL

Databases

KDB+, Relational databases, Vector databases

Deep Learning/AI

Pytorch, Lightning, LangGraph, OpenAI API, Claude Code

HPC

MPI, Multiprocessing, Slurm, PySpark

Cloud

Databricks, Azure

Publications

- [1] A. Maurais, **T. Alsup**, B. Peherstorfer, and Y. Marzouk. Multi-fidelity Covariance Estimation via Regression on the Manifold of Symmetric Positive Definite Matrices. *SIAM Journal on Mathematics of Data Science*, 2025.
- [2] **T. Alsup**, T. Hartland, B. Peherstorfer, and N. Petra. Further Analysis of Multilevel Stein Variational Gradient Descent with an Application to the Bayesian Inference of Glacier Ice Models. *Advances in Computational Mathematics*, 2024.
- [3] A. Maurais, **T. Alsup**, B. Peherstorfer, and Y. Marzouk. Multi-fidelity Covariance Estimation in the Log-Euclidean Geometry. In *International Conference on Machine Learning (ICML)*, 2023.
- [4] **T. Alsup** and B. Peherstorfer. Context-Aware Surrogate Modeling for Balancing Approximation and Sampling Costs in Multi-fidelity Importance Sampling and Bayesian Inverse Problems. *SIAM/ASA Journal on Uncertainty Quantification*, 2022.
- [5] **T. Alsup**, L. Venturi, and B. Peherstorfer. Multilevel Stein Variational Gradient Descent with Applications to Bayesian Inverse Problems. In *Mathematical and Scientific Machine Learning (MSML) 2021*, 2021.
- [6] **T. Alsup** and T. Catanach. Expected Information Gain Estimates and Bayesian Optimal Experimental Design. In J.D. Smith and E. Galvan, editors, *Computer Science Research Institute Summer Proceedings 2021*, pages 269–282, 2021. Technical Report: SAND2022-0653R.

Awards

Vista Hackathon Winner - The Grid: Federated Learning for the Credit Invisible	2022
BGCE Student Paper Prize Finalist	2021
SIAM Student Travel Award	2020, 2022
Henry MacCracken Fellowship	2017 – 2023
STEM Fellowship (Georgia Tech Math Department)	2017

Teaching

Mathematical Statistics, <i>NYU</i> , Teaching Assistant (3 semesters)	2020–2021
Introduction to Machine Learning, <i>NYU</i> , Class Assistant (2 semesters)	2019–2020
Stochastic Calculus, <i>NYU</i> , Teaching Assistant (1 semester)	2018
Differential Equations, <i>Georgia Tech</i> , Teaching Assistant (2 semesters)	2014–2015

Projects

Fantasy Football Luck Calculator for Round-Robin Scheduling	2024
Learning Large Graphical Models via Convex Optimization	2020
Parallel Kinetic Monte Carlo, <i>with Anya Katsevich</i>	2019
Multi-fidelity Cross-Entropy Estimation of Rare Events, <i>with Frederick Law</i>	2019
Image Forgery Detection in Alipay, <i>with Ant Financial as a part of RIPS-HK</i>	2016