Jiajia Xie

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EDUCATION

Georgia Institute of Technology **Aug 2019 – Dec 2025 (expected)**
Ph.D/M.S in Computational Science and Engineering *Atlanta, Georgia*

Presbyterian College **July 2016– May 2019**
*BS in Economics - **3.95/4.00*** *Clinton, South Carolina*

TECHNICAL SKILLS

Languages: Python, Matlab, R, C++, JavaScript, SQL
Developer Tools: VS Code, Jupyter, Git, Linux, GitHub
Platforms: PyTorch, Tensorflow, Hadoop, Spark, DBeaver, PostgreSQL, AWS, Azure
Algorithms: Numerical Linear Algebra, Data Structures & Algorithms, Linear/Integer/Convex/Online Optimization, Iterative Methods for System of Equations, Bayesian Inference
Machine Learning: Variational Generative Models, Bayesian Models, Physics-informed Machine Learning, Text Mining

INTERNSHIP

Tesla **Sep 2023 – Dec 2023**
Data Scientist, Charging Data and Modeling *Palo Alto, California*

- Automated the analysis of charging-related KPIs time series to identity market entry date, price effective/promotion dates for countries using PySpark and SQL.
- Designed and implemented a new matching weekday logic to shift historical energy demand with scaling to forecast daily energy demand over the years. **Accuracy improved by** 30% **in holiday demand forecasts.**
- Designed and implemented a novel yearly jumps detection algorithm for energy forecast validation. Utilized the Fisher discriminant ratio as the optimization objective of the changepoint detection model. Designed a statistical test to check jump candidates by the p-value and optimize the threshold using the AUC-ROC curve. **The evaluation shows precision improved by** 10% **while maintaining recall over** 80%
- **Tech:** PySpark, SQL, Pandas, Scikit-learn, Numpy, Scipy

Berkeley Lab **May 2023 – Aug 2023**
Research Scientist, Building Technology Area *Berkeley, California*

- Researched a Meta-learning-based framework for learning representative time series models to describe indoor thermal dynamics of residential buildings using Ecobee data [1].
- Developed and implemented a meta-learning algorithm, Reptile, with flexible model selections and objectives.
- Experimented the framework with various recurrent neural network models. Results show (1) **the cost of training a personalized model from the meta-model is significantly reduced**, (2) **The representative (meta) model can describe the physics of similar residential buildings**.
- **Tech:** PyTorch, Scikit-learn

PROJECTS

Confirmation Augmented Bayesian Topics Models [2] | Scipy, Numpy, Twitter-Api-V2 **2021 - 2022**

- Design an online algorithm for Bayesian inferencing probabilistic topic models.
- Clusters are augmented by a confidence score linked to the presence of interested topics
- Evaluation on linking tweets and Waze (Community Traffic App) show significant improvement in clustering of traffic-related topics

Empirical WiFi Networks [3] | NetworkX, PySpark, Mesa, Multiprocessing **2020 - 2021**

- Develop, maintain, and optimize data pipeline to process campus's WiFI data to networks
- Develop agent-based simulation for modeling Covid-19 spreading on campus with hyperparameters optimization framework
- Evaluation of various lock-down policies.

DeepCovid [4] | PyTorch, Scikit-learn **May 2020 - Oct 2020**

- Involving the ensemble modeling-hub conducted by CDC to submit weekly forecast of COVID-19-related time-series, hospitalization and deaths.
- Developed a bootstrapping-based deep-learning framework to transform online signals into accurate forecast
- Evaluation shows outperformance over short-term predictions and explainable epidemiological insights for disease controls

References

[1] Xie, Jiajia, Han Li, and Tianzhen Hong: *A lifelong meta-learning approach for learning deep grey-box representative thermal dynamics models for residential buildings.* Energy and Buildings, page 114408, 2024.

[2] Xie, Jiajia, Christin J Salley, Neda Mohammadi, and John E Taylor: *Online confirmation-augmented probabilistic topic modeling in cyber-physical social infrastructure systems.* In *Proceedings of the 10th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation*, pages 390–397, 2023.

[3] Das Swain, Vedant, Jiajia Xie, Maanit Madan, Sonia Sargolzaei, James Cai, Munmun De Choudhury, Gregory D Abowd, Lauren N Steimle, and B Aditya Prakash: *Empirical networks for localized covid-19 interventions using wifi infrastructure at university campuses.* Frontiers in Digital Health, 5:1060828, 2023.

[4] Rodriguez, Alexander, Anika Tabassum, Jiaming Cui, Jiajia Xie, Javen Ho, Pulak Agarwal, Bijaya Adhikari, and B Aditya Prakash: *Deepcovid: An operational deep learning-driven framework for explainable real-time covid-19 forecasting.* In *Proceedings of the AAAI Conference on Artificial Intelligence*, volume 35, pages 15393–15400, 2021.

[5] Cramer, Estee Y, Evan L Ray, Velma K Lopez, Johannes Bracher, Andrea Brennen, Alvaro J Castro Rivadeneira, Aaron Gerding, Tilmann Gneiting, Katie H House, Yuxin Huang, *et al.*: *Evaluation of individual and ensemble probabilistic forecasts of covid-19 mortality in the united states.* Proceedings of the National Academy of Sciences, 119(15):e2113561119, 2022.

[6] Cramer, Estee Y, Yuxin Huang, Yijin Wang, Evan L Ray, Matthew Cornell, Johannes Bracher, Andrea Brennen, Alvaro J Castro Rivadeneira, Aaron Gerding, Katie House, *et al.*: *The united states covid-19 forecast hub dataset.* Scientific data, 9(1):462, 2022.

[7] ElSherief, Mai, Koustuv Saha, Pranshu Gupta, Shrija Mishra, Jordyn Seybolt, Jiajia Xie, Megan O'Toole, Sarah Burd-Sharps, and Munmun De Choudhury: *Impacts of school shooter drills on the psychological well-being of american k-12 school communities: a social media study.* Humanities and Social Sciences Communications, 8(1):1–14, 2021.

[8] Xie, Jiajia: *Using wifi mobility data for modeling covid-19 on university campuses.* 2021.