Yan Sun

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EDUCATION

Georgia Institute of Technology **Atlanta, GA**

Ph.D. in Machine Learning Jan 2021 – Jul 2024 (Expected)

- Courses: Advanced Nonlinear Programming, Advanced Statistical Models, Theoretical Statistics, Deep Learning
- GPA: 3.9 | 4.0

Georgia Institute of Technology **Atlanta, GA**

M.S. in Industrial Engineering Aug 2019 – Dec 2020

- Courses: Multivariate Data Analysis, Computational Data Analysis, Supply Chain Systems
- GPA: 4.0 | 4.0

Tsinghua University **Beijing, China**

B.S. in Industrial Engineering Aug 2015 – Aug 2019

- Courses: Computational Statistics, Calculus, Linear Algebra, Data Structure, Optimization
- GPA: 3.56 | 4.0

WORKING EXPERIENCE

Merck Sharp & Dohme

Associate specialist, mentor: Vladimir Turzhisky May 2023 – Nov 2023

Explainable deep learning method for multivariate forecasting

- Development of an explainable deep learning method for multivariate demand forecasting,
- Real-world analysis based on historical vaccine data & disease infection data.

Causal inference for evaluating novel drug effects

- Evaluation of newly developed medicine using targeted learning and propensity score.
- Provides a large-scale cohort study which supports future experimental studies.

SF Express & Georgia Institute of Technology

Research analyst, advisor: Prof. Benoit Montreuil Jan 2021 – Dec 2021

Demand forecast for dynamic parcel routing problem

- Simulation of real-time parcel demands for over 1,000 cities in China using Bayesian Sampling and time series techniques.
- Designed an internal demand prediction platform using Java and Python, which aimed for optimized parcel routing algorithm under sophisticated scenarios (high-volume, lock down, etc.).
- Achieved over 10% cost savings compared to current routing policy.

Database development and management

- Established and maintained a database which stores over 1 billion historical records of historical parcel information.
- Combined novel database technologies (MySQL, Redis) to achieve high performance and concurrency.

SELECTED RESEARCH EXPERIENCE

Online change point detection of parameters in ODE systems, advisor: Prof. Shihao Yang Aug 2022 – Dec 2022

- Incorporated change point detection approaches and hypothesis testing in parameter estimation of ODE systems.
- Aimed for wide applications including locating contact rate changes during a pandemic, component changes in ecosystems, etc..

Infectious disease prediction through data fusion of internet search, advisor: Prof. Shihao Yang Jan 2022 – Aug 2022

- Prediction of COVID-19 cases and hospitalization using time series method with fusion of Internet search data.
- Achieved better performance than state-of-the-art benchmarks in COVID-19 related prediction.

Parameter inference in dynamic ODE systems, advisor: Prof. Shihao Yang Jan 2021 – Dec 2021

- Proposed a Manifold-constrained Gaussian process method for estimating parameters in dynamic systems as time series.
- Provided a numerical-integration-free framework for estimating general parameters (time-varying, constant, etc.).
- Achieved more than 100 times faster than popular numeric approaches, such as Runge-Kutta method.

PUBLICATIONS

1. **Sun, Y.**, & Yang, S. (2021). Manifold-constrained Gaussian process inference for time-varying parameters in dynamic systems. arXiv preprint arXiv:2105.13407.
2. **Sun, Y.**, & Yang, S. (2022). Online parameters change point estimation in general dynamic systems. (In progress)
3. Ma, S., **Sun, Y.** & Yang, S. (2022). Using Internet Search Data to Forecast COVID-19 Trends: A Systematic Review. Analytics 2022, 1(2), 210-227; https://doi.org/10.3390/analytics1020014.

4. Protter, P., Wu, Q., **Sun, Y.** & Yang, S (2022), Order Book Queue Hawkes-Markovian Modeling. SIAM Journal of Financial Mathematics (in revision).
5. **Sun, Y.** & Yang, S. (2022). Autoimmune Risks of Lung Cancer Immunotherapy – A Cohort Study. (In revision)

SELECTED HONORS & AWARDS

- H. Milton Stewart fellowship, Georgia Institute of Technology (2021)
- George Leadership Fellowship, Georgia Institute of Technology (2021)

SKILLS & QUALIFICATIONS

- Language: Excellent Chinese-English bilingual communication skills, German.
- Computer language: Python, SQL, R.
- Interests: flute, billiard.