

Ting Gao

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EDUCATION

Illinois Institute of Technology Ph.D., Applied Math (GPA: 4.0)	Aug. 2010 – May. 2015
Southwest University M.S., Applied Math (Exempted from Graduate Entrance Exam)	Sep. 2007 – Jul. 2010
Southwest University B.S., Mathematics	Sep. 2003 – Jul. 2007

WORK EXPERIENCE

Associate Professor, Huazhong University of Science and Technology

Wuhan, Hubei, China

Feb. 2021 - Present

- System Identification for non-Gaussian Noise Induced Stochastic Systems
 - Mathematical Foundations of Machine Learning
 - o Manifold Learning
 - o Generative Latent Structure Modeling
 - Applications: Stock prediction and optimal control, Multi modal ultrasound breast cancer detection
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Machine Learning Engineer II, Revenue Science R&D

Twitter, San Francisco, CA

Dec. 2018 – Feb. 2021

- Learning-period ads optimization
 - o Improved PCTR prediction via attention mechanism on deep neural network
 - o Designed multiple boosting mechanisms for enhancing new campaigns' survival rate during/after learning period as well as better long-term ads budget utilization
 - o Designed experiments and analyzed new campaigns' performance to help make business decisions
- Launched a new large scale deep learning model for real time video ads engagement prediction
- Designed and implemented an innovative reinforcement learning framework for real time bidding in ads auction Presented state-of-the-art research papers from premier conferences
- Led two summer interns: PCTR exploration through contextual bandit, CPE optimization via reinforcement learning

Senior Data Scientist/Tech Lead, R&D

Machine Zone, Palo Alto, CA

Sep. 2017 – Nov. 2018

- Refactored sales recommendation system to OOP modules and generalized ML tools
 - o Scale up personalized sales recommendation system to players at all levels and all price points.
 - o Build map-reduce data pipeline to improve data quality with PySpark.
- Developed cohort inflation optimization model and tool to improve total ROI for new game release
 - o Automate cohort sales inflation strategies with Multi-arm bandit UCB.
- Built MZ's first sales recommendation system to improve revenue lift and purchase conversion
 - o Data pipeline from various data sources: Hive, Vertica, MySQL, Hbase, Redis.
 - o Models using DDPG, LSTM, GBT, Clustering & robust Softmax, Sequential Pattern Mining.
 - o AB testing experiments framework for model iterations and automatic performance report.

Data Scientist, R&D

Machine Zone, Palo Alto, CA

Mar.2016 – Sep. 2017

- Created a data product to track the healthiness of long term user engagement and optimize strategies on critical targets
 - o Markov chain modeling for cohort flow/churn prediction.
 - o Created a tree based generic bucketing framework for time series anomaly detection.
- Long term revenue prediction
 - o Created revenue targeting and prediction model/UI to help sales reach monthly revenue goal and game feature release.

- o Built random probability matching algorithms for real time creative optimization.
- o Budget planning and allocation for product release using linear programming and portfolio optimization algorithms.

Data Analyst, R&D

Machine Zone, Palo Alto, CA

Feb. 2015 – Mar. 2016

- Built automatic reports for Game KPI and ROI summary to support game design and live operations.
- Designed statistical analysis and Machine learning methods to help make business decision
 - o Game: kingdom open/close control, kingdom war pairing, inflation analysis, etc.
 - o Marketing TV ads campaign management, ROI prediction.

Graduate Research & Teaching Assistant

Illinois Institute of Technology, Chicago, I

Aug. 2010 – Dec. 2014

- Created numerical algorithms for computing first passage time and escape probability of Non-Gaussian process.
- Quantifying model uncertainty under Non-Gaussian noise.
- Taught courses: Computational Mathematics, Probability and Statistics, Calculus, hand-on Mathematica lab.

Institute for Pure and Applied Mathematics (IPAM), Los Angeles, CA

Jan. 2012 – Jul. 2013

- Created numerical algorithms for computing Fokker-Planck equations of Non-Gaussian process.
- Data assimilation under Non-Gaussian noise.

TECHNICAL SKILLS

- Programming Languages: Python, R, Scala, C, Matlab, Tensorflow, Pytorch
 - Database & Big Data Ecosystem: MySQL, Vertica, HIVE, Hbase, Redis, Druid, Hadoop, Spark
 - Stochastic modeling, Time Series Analysis, Statistical Learning, Deep Learning, Deep Reinforcement Learning
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PUBLICATIONS & PATENTS

W. Wei, **T. Gao**, X. Chen, J. Duan, An Optimal Control Method to Compute the Most Likely Transition Path for Stochastic Dynamical Systems with Jumps, *Chaos*, 2022.

C. Fang, Y. Lu, **T. Gao** and J. Duan, An end-to-end deep learning approach for extracting stochastic dynamical systems with α -stable Levy noise, arXiv:2201.13114, submitted, 2022.

H. Huang, **T. Gao**, Y. Gui, J. Guo, P. Zhang, Stock Trading Optimization through Model-based Reinforcement Learning with Resistance Support Relative Strength, submitted to KDD, 2022.

Y. Lu, R. Maulik, **T. Gao**, F. Dietrich, I. Kevrekidis, J. Duan, Learning the temporal evolution of multivariate densities via normalizing flows, *Chaos* 32, 033121, 2022.

L. Yang, **T. Gao**, Y. Lu, J. Duan and T. Liu, Time Series Forecasting with Ensembled Stochastic Differential Equations Driven by Levy Noise, arXiv: 2111.13164, 2021.

Min Dai, **Ting Gao**, Yubin Lu, Yayun Zheng, Jinqiao Duan, Detecting the maximum likelihood transition path from data of stochastic dynamical systems, *Chaos*, 30, 113124, 2020.

Ting Gao, C. Lam, etc. Sales inflation recommendation based on DDPG. *Application number 62/856,536*. 2019.6.3.

Ting Gao, J. Duan, X. Li, Fokker-Planck Equations for Stochastic Dynamical Systems with Symmetric Levy motions. *Appl. Math Comput.* Vol.278, (2016) 1-20.

Ting Gao, J. Duan, Quantifying model uncertainty in dynamical systems driven by non-Gaussian Levy stable noise with observations on mean exit time or escape probability. *Commun Nonlinear Sci Numer Simulat.* 39 (2016) 1-6.

Ting Gao, J. Duan, X. Kan, Dynamical inference for transitions in stochastic systems with alpha-stable Levy noise. *J Phys A-Math Theor.* Vol.49(29), December, 2015.

Ting Gao, J. Duan, X. Li, R. Song, Mean exit time and escape probability for dynamical systems driven by Levy noise. *SIAM J. Sci. Computing.* Vol. 36, No. 3, pp. A887-A906, 2014.

M. Hao, **Ting Gao**, J. Duan, W. Wu, Non-Gaussian dynamics of a tumor growth system with immunization. *Inverse Problems & Imaging*, Vol. 7 Issue 3, August, 2013.

Ting Gao, J. Duan, G. He, Quantifying Model Uncertainties in the Space of Probability Measures. *Interdisciplinary Mathematical Sciences*. Volume 13, p.99-110, 2012.

J. Ren, C. Li, **Ting Gao**, X. Kan and J. Duan, Mean Exit Time and Escape Probability for a Tumor Growth System under Non-Gaussian noise. *International J. Bifurcation and Chaos*, Vol. 22, No. 4, 2012.

Ting Gao, Wendi Wang, Xianning Liu, Mathematical analysis of an HIV model with impulsive antiretroviral drug doses. *Mathematics and Computers in Simulation*. Vol. 82, Issue 4, p.653-665, 2011.

Ting Gao, Wendi Wang, Global analysis of a viral model with delayed intracellular immune response. *Journal of Southwest University (Natural Science)*, April, 2009.