Tao Jin

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EDUCATION

Ph.D. in Computer Science — Feb. 2018 - May 2025
University of Virginia — Charlottesville, VA, U.S.

B.Eng. in Computer Science — Sept. 2012 - June 2017
Zhejiang University — Hangzhou, Zhejiang, China

PUBLICATIONS (∗ INDICATES EQUAL CONTRIBUTION)

- **Tao Jin**∗, Yue Wu∗, Quanquan Gu, Farzad Farnoud: *Ranking with Multiple Oracles: From Weak to Strong Stochastic Transitivity* [ICML'25]
- Yue Wu, **Tao Jin**∗, Qiwei Di∗, Farzad Farnoud, Quanquan Gu: *Borda regret minimization for generalized linear dueling bandits* [ICML'24]
- Qiwei Di∗, **Tao Jin**∗, Yue Wu, Farzad Farnoud, Quanquan Gu: *Variance-Aware Regret Bounds for Stochastic Contextual Dueling Bandits* [ICLR'24]
- Hao Lou, **Tao Jin**, Yue Wu, Pan Xu, Farzad Farnoud, Quanquan Gu: *Active Ranking without Strong Stochastic Transitivity* [NeurIPS'22]
- Yue Wu∗, **Tao Jin**∗, Hao Lou, Pan Xu, Farzad Farnoud, Quanquan Gu: *Adaptive Sampling for Heterogeneous Rank Aggregation from Noisy Pairwise Comparisons* [AISTATS'22]
- **Tao Jin**∗, Pan Xu∗, Quanquan Gu, Farzad Farnoud: *Rank Aggregation via Heterogeneous Thurstone Preference Models* [AAAI'20, Oral]
- Chenghao Liu, **Tao Jin**, Steven Hoi, Jianling Sun, Peilin Zhao: *Collaborative Topic Regression for Online Recommender Systems: An Online and Bayesian Approach* [ACML'16, Machine Learning Journal]

EXPERIENCE

Applied Scientist *Amazon* — July 2024 - Now
- Designed and implemented an agentic workflow to automate dispute processing, including contact handling, document retrieval and creation, case assembly, and risk evaluation.
- Research and apply efficient training and data selection methods for fraud detection models.
- Integrate few-shot learning techniques with large language models to enhance fraud detection performance.

Applied Scientist Intern *Trinity AI* — Jan. 2024 - May 2024
- Improved recall for sensitive-information protection by 30% using open large language models (LLMs), prompt engineering, and efficient fine-tuning on a small dataset.

Applied Scientist Intern *Amazon* — June 2023 - Aug. 2023
- Trained and deployed sequential recommendation transformer models that improved recall by 8% in offline benchmarks and increased click-through rate by 5% in A/B tests.
- Analyzed model performance across sizes (10M–100M parameters) and training data scales (5M–200M samples), and designed deployment strategies under compute and latency constraints.
- Profiled and optimized the training data pipeline, reducing data preparation time by 90%.

Research Assistant *Computer Science Department, University of Virginia* — Feb. 2018 - July 2025
- Ranking problems with noisy pairwise comparisons:
    - Proposed Heterogeneous rank aggregation (HRA) models to optimize the sample complexity when information sources has various levels of reliability.
    - Studied convergence properties of the HRA model when alternating gradient descent is applied, as well as its estimation error lower and upper bound.
    - Developed active/adaptive learning strategies for noisy ranking problems under multi-armed bandit and dueling bandit settings.
- Generic and genetic data compression and/or deduplication:
    - Developed a data deduplication algorithm based on the Lempel-Ziv decomposition.
- Genetic mutation and antibiotics resistance (AMR) prediction and knowledge discovery:
    - Given a limited amount of data, constructed a Hidden Markov Model based on history of genetic evolutions of bacteria exposed to a sequence of drugs to discover the relationship between genetic mutation and drug resistance.
    - Predicted AMR efficiently using correlation between genotype and phenotype to perform feature selection.

Computer Vision Scientist *Momenta Technology Ltd.* — Feb. 2017 - Feb. 2018
- *Lead a team of 4 engineers and 8 data operation interns.*

- Developed traffic light and traffic sign detection and tracking algorithm for autonomous driving with iterative data collection and model training cycle.

  Co-worked with general data operation team to set up labeling rules, operation strategy and management tactics. Delivered million-scale training data in 6 months for model training.

  Improved key point/landmark detection model as front-end for mapping and localization.

  Tailored detection network structures to meet computational requirements for both embedded devices and servers.
- Reproduced Mask-RCNN work using Momenta's deep learning framework.
- Integrated traffic light and traffic sign detection and tracking algorithm into Momenta's autonomous driving system and showed success in road test.

Research Assistant *School of Information Systems, Singapore Management University*   Sept. 2015 - June 2016
- Proposed and developed an online Bayesian learning method for recommendation with side information.
- Assisted development and deployment of FoodAi. Trained and tuned deep learning algorithm for food recognition. Developed backend of web server with rate limit to process the request and designed a frontend user interface.
- Implemented and deployed an application using neural network to transfer artistic effects.
- Implemented ResNet with caffe and mxnet, available at *Github: ResNet*.

Research Assistant *Undergraduate Student Research Training Program, Zhejiang University*   2014 - 2015
- *Advisor: Prof. Jianling Sun*
- Acquired fundamental knowledge in machine learning field, specifically topic modeling and graphic models.
- Gained essential experience for carrying out research projects. Authored one technical report.

Research Assistant *ArcLab, Zhejiang University*   2013 - 2015
- Selected to be enrolled in *Motivated Students in Computer Architecture*.
- Developed open source project for a MIPS/RISC-V ISA reference design *Duo-RISC* .

  Written in Chisel (a Scala DSL), an emerging handy tool for developing hardware description designs. The core provides MIPS and RISC-V dual instruction support.
- Implemented a software hardware co-design project *Zynq Go* in collaboration with other students.
- Developed a *MIPS SoC on Nexys3* in collaboration.

  Implemented a MIPS core and a MIPS assembler.

  Added simple video buffer utilizing on-board memory chips to enable program controlled video output.

Skills

- Programming: Python, C/C++
- Machine learning and data: deep learning, ranking and bandit algorithms, recommendation and prediction models, data processing and analysis
- Collaboration and leadership: leading small engineering teams, coordinating with data operations and cross-functional partners
- Research and experimentation: problem formulation, algorithm design and analysis, A/B testing and large-scale model evaluation
- Embedded and hardware: PCB design, SoC/FPGA and hardware–software co-design, and end-to-end embedded system projects
- Web development: full-stack web applications (backend services, APIs, databases, and front-end interfaces)
- Tools and platforms: Linux, Git
- Languages: English (Professional), Chinese (Native)

Teaching Services

Mathematics of Information	Spring 2021, Spring 2020
Farzad Farnoud, University of Virginia	*TA, and prepared part of the course material*
Algorithms	Fall 2019
David Wu, John Hott, University of Virginia	*TA*
Algorithms	Spring 2019
Daniel Graham, University of Virginia	*TA*
Discrete Mathematics	Spring 2019
Kevin Sullivan, University of Virginia	*TA*
Introduction to Computing Systems	Summer 2016
Yale N. Patt (University of Texas at Austin), Zhejiang University	*Head TA of 200-student class with 8 TAs*
Computer Architecture	Fall 2014
Kai Bu, Zhejiang University	*TA*

Computer Architecture   Summer 2014
Yamin Li (Hosei University), Zhejiang University   *TA*
System on Chip Design   Spring 2014
Qingsong Shi, Zhejiang University   *TA*

Acamedic Services

Reviewer for AAAI AISTATS ICLR ICML NeurIPS ICCV

Demo Projects

Web development

○ Maintainer of FoodAi.org and its API service.   2016
  A demonstration project for deep learning based solution for image recognition.

  - Python Flask back-end, with SQL ORM model.
  - Redis database for rate limiting and logging.
  - Ordinary JavaScript and jQuery front-end stack with minor CSS tuning.
  - Computation module: CUDA GPU programming.

○ Performed agile web development: *resomate*   *with Ketian Xu*, 2015
  Implemented a preliminary SNS website using Meteor.

  - Full stack development with JavaScript.
  - MongoDB for database.

○ Business startup undertaking project: *iLove TeChan*.   2013-2014

  - Wechat public account back-end service
  - Naive PHP development with front-end framework Bootstrap for building a questionnaire collection service.

Embedded Design and Hardware Development

○ Proposed one open-source project with reference design *Duo-RISC*   2015

  - Written in Chisel, a Scala DSL, an emerging handy tool for developing hardware description designs.
  - This core provides MIPS and RISC-V dual instruction support

○ Implemented a software hardware co-design project *Zynq Go*   *with Shijia Wei*, 2014

  - Involved FPGA design and Linux Kernel tweaking.
  - Attended Digilent Design Contest 2014 China Worldwide Finals with 3rd prize.

○ Carried out design *MIPS SoC on Nexys3*   *with Bingchen Gong* , 2013

  - Implemented a MIPS core and a MIPS assembler.
  - Initial support for vanilla video buffer utilizing on-board memory chips.