zwxiao@gmail.com | xoyowade.github.io | Software Architect/Tech Lead **Zhiwei Xiao**

Skills

- 17-year software development exp./ 12-year industry exp./ 7-year tech leadership exp.
- Expertise in building high-performance distributed systems with C++ and Linux from scratch

Experience

Ruitian Capital | Quantitative Trading | **Architect / Director of Trading / Quant Researcher** 2015.05-Present

- **Built full-stack systems from strategy research to production**, with C++/Python. Helped Ruitian rapidly grow from a 4-person start-up to an industry leader.
  - Infrastructure: storage / network lib / regression platform / CICD / task schedule / VM mgr. and recovery
    - Shared-memory message queue: high-performance inter-process communication
  - Strategy support
    - Designed research platform for feature and model, keeping online/offline results consistent
    - Implemented and productized distributed prediction system for Machine Learning models
  - Trading system: implemented strategy execution and trading systems
    - TradeAgent broker connector: routes trading messages in hybrid network env. and isolates external faults
    - Supported 20+ PM and connected 100+ domestic and oversea broker systems
    - Broke monolithic systems into concurrent service pipelines, with lightweight data communication
    - Built emulation and reconcile environment to keep 99% of code path verified every day
    - Full stack observability: monitor service status, latency, IO and logs with streaming processing
  - Data: ETL flow for contract information, market events and daily trade data reconcile
- **Performance tuning**
  - Improved feature generation performance with 500x speedup trough C++ template and code generation
  - Refactored trading/backtest system with high-throughput and low-latency design, and gain 50x speedup
  - Optimized tick-to-trade latency with more than 1000x speedup, by tuning hardware/kernel/application
  - Designed a colocation architecture in a restricted environment, improving 10% profit
  - Improved post-trade reconcile performance with 12x speedup, by paralleling alpha and action reconcile
  - Optimized multiple-group and rolling OLS fitting with more than 10x speedup, by reducing calculation/IO
- **Quantitative Research**
  - Built a robust index-futures feature workflow and developed stable features for intra-day trading signals
  - Enhanced stock features performance with a 20% R^2 boost using advanced time series techniques

Yunrui Securities | Securities Broker | **CTO** 2022.03-2024.09

- Yunrui was a fast-growing broker startup in Hongkong, in deep collaboration with Ruitian
- Built broker system in C++/Python/Go/Vue.js, reduced op-fault rate by 90% with biz procedure optimization
- Refactored data and risk control flow, improved R&D work efficiency by more than 2 times

Synopsys | Electronic Design Automation | C++ Developer 2013.11-2015.06

- Developed profiling tools for diagnosing memory and CPU usage in chip simulator

Tencent | Search Advertising System | C++ Developer 2012.07-2013.11

- Built systems for advertising in search results and messages feeds

Education

Fudan University | M.S. Computer Science | Distributed System Research (google scholar) 2009.09-2012.06

- Implemented a hierarchical MapReduce framework and outperformed Hadoop from 1.4x to 3.5x. (PACT' 11)

Rice University | Visiting Student | Distributed Programming Language 2011.09-2011.12

Fudan University & University College Dublin Joint Degree | B.Eng. Software Engineering 2005.09-2009.06

Publications

Zhiwei Xiao. Design and Implementation of a Hierarchical MapReduce Model for Multi-core Clusters. Master's Thesis, Fudan University, 2012

Zhiwei Xiao, Haibo Chen, Binyu Zang. A Hierarchical Approach to Maximizing MapReduce Efficiency. 2011 International Conference on Parallel Architectures and Compilation Techniques (PACT), 2011 [pdf]

Chao Zhang, Chenning Xie, **Zhiwei Xiao**, and Haibo Chen. Evaluating the Performance and Scalability of MapReduce Applications on X10. Advanced Parallel Processing Technologies: 9th International Symposium (APPT), 2011.

Jing Xiao, **Zhiwei Xiao**. High-integrity MapReduce computation in cloud with speculative execution. International Conference on Theoretical and Mathematical Foundations of Computer Science, 2011.

Shengkai Zhu, **Zhiwei Xiao**, Haibo Chen, Rong Chen, Weihua Zhang and Binyu Zang. Evaluating SPLASH-2 Applications Using MapReduce. Advanced Parallel Processing Technologies: 8th International Symposium (APPT), 2009. [pdf]

Patents

Haibo Chen, **Zhiwei Xiao**, Binyu Zang. Method for processing cross task data in distributive network system. CN CN102137125A

Haibo Chen, **Zhiwei Xiao**, Binyu Zang. Method for establishing hierarchical mapping/reduction parallel programming model. CN CN102193831B

Awards

First Grade Scholarship for Graduate Students (2010)
Outstanding Contribution Award, PPI Research Laboratory (2009)
First Grade Scholarship for Excellent Freshman (2009)
Second Grade Scholarship for Undergraduate Students (2006, 2007, 2008)

Math & AI Courses

Advanced Mathematics (including calculus and linear algebra topics) (2005-2006). Grade: A or 4.0
Discrete Mathematics (2006-2007). Grade: A- or 3.7
Probability and Statistics (2007-2008). Grade: A or 4.0
Artificial Intelligence (2008-2009). Grade: A- or 3.7
Natural Language Processing(2010-2011). Grade: B+ or 3.3

Teaching Assistant Work

Computer System Engineering (Spring, 2011)
Artificial Intelligence (Autumn, 2010)
Compiler (Autumn, 2009)
Operating System (Autumn, 2008)