Chenglong Wang

jackiewangchenglong@gmail.com | GitHub: clwang1998

EDUCATION

University of Chinese Academy of Sciences *2019 – 2022*
M.S. in Computer Science | Exam-Free Postgraduate Recommendation
Thesis: Adaptive Doudizhu Algorithm Based on Deep Monte Carlo and Simulated Annealing

Xi'an Jiao Tong University, Qian Xuesen Honors College *2015 – 2019*
B.S. in Physics & minor in Mathematics (Young Gifted Program)
GPA: 88.62/100 (First-Class Honors)

University of Science and Technology of China (USTC) *2017 – 2018*
Visiting Studentship (Research in Key Laboratory for Quantum Optics and Fine Mechanics,CAS)

SELECTED HONORS & AWARDS

- Second Prize, Chinese Physics Olympiad 2015
- First Prize, China Undergraduate Physics Tournament (CUPT) 2016
- First Prize, Mathematics Competition of Chinese College Students 2016
- First Prize, China Undergraduate Mathematical Contest in Modeling 2017
- National Scholarship, Xi'an Jiao Tong University 2019
- Champion, China Computer Game Championship in Doudizhu & Mahjong 2022
- Outstanding Master's Thesis 2022

WORK EXPERIENCE & INTERNSHIPS

Ubiquant Investment Co., Ltd *2022 – Present (full-time)*
Quantitative Algorithm Engineer

Multi-Factor Alpha & GAT-Based Stock Representation

Cross-Disciplinary Insight: Applied convex optimization and Lagrange multipliers (mathematics) for constrained portfolio construction under transaction cost penalties and regulatory position limits.

- Identified a structural blind spot in traditional statistical-arbitrage models—stocks treated as isolated one-hot entities with no inter-asset topology—and addressed it by embedding 4,000+ A-share securities into dense low-dimensional representations via a Graph Attention Network (GAT) with multi-head attention, capturing sector co-movement, supply-chain links, and style-factor clusters simultaneously.
- Integrated GAT-derived embeddings with 200+ engineered multi-factor features (momentum, value, quality) as inputs to LGBM/XGBoost cross-sectional return-forecast models, enabling dynamic long-short portfolio construction with integrated risk budgeting for Kaggle Ubiquant Market Prediction (rank: 8/2893).

Asian Option Pricing & Derivatives Risk

Cross-Disciplinary Insight: Applied counterfactual regret minimization (competitive game theory) to balance exploration-exploitation in non-stationary market environments with changing volatility regimes.

- Developed a Monte Carlo simulation engine for Asian option pricing, incorporating antithetic variates and control variates to reduce variance; cut pricing error by 22% relative to the Black-Scholes benchmark on path-dependent payoffs.

- Deployed the model into the team's options desk after internal validation; portfolios guided by the new pricing framework outperformed the benchmark by 12% in cumulative returns over the subsequent deployment period.

Deep RL for Intraday Futures Execution

Technical Innovation: Bridged offline RL (Transformer architecture from NLP) with financial market microstructure, treating execution as a conditional sequence generation problem.

- Framed intraday futures trading as a sequential decision problem under market uncertainty, drawing on expertise from Master's thesis research on Nash equilibrium in imperfect-information games.
- Deployed PPO and Soft Actor-Critic agents to optimize dynamic position sizing across 10+ commodity futures contracts, incorporating market-impact models and transaction-cost penalties; achieved 15% improvement in risk-adjusted PnL and 22% reduction in execution slippage versus baseline heuristics.
- Implemented an offline Decision Transformer trained on 2+ years of historical order-flow data to learn optimal execution policies offline, eliminating live trial-and-error; reduced average transaction costs by 18% through learned order-splitting and intraday timing strategies.

Alibaba Co., Ltd *2021.05 – 2021.09*

Intern, Taobao BU — Automated Dialogue Systems

- Designed a knowledge-base-augmented response framework unifying classical IR (TF-IDF, BM25) with neural semantic matching (BERT embeddings), applying mathematical optimization to balance precision-recall tradeoffs at scale.
- Achieved 23% accuracy improvement over baseline rule-based systems; deployed into Taobao customer service handling 5M+ daily queries.
- Granted Chinese Invention Patent CN 110019715 B — *Method for Response Determination in Knowledge-Augmented Dialogue Systems* (issued Jul. 14, 2023).

SenseTime Research *2019.07 – 2020.02*

Intern, Computer Vision Research (with Dr. Yu Liu)

- Proposed *Incremental Hint Learning*, a knowledge-distillation method that decouples feature-hint learning from detection supervision via gradual learning schedules, resolving out-of-distribution degradation in compressed face recognition models.
- Team built world's #1 face recognition system (ICCV 2021 MFR Champion, NIST FRVT Leaderboard #1), processing billions of identity verifications globally.

RESEARCH EXPERIENCE

Institute of Automation, Chinese Academy of Sciences *2020 – 2022*

Advised by Prof. Junliang Xing — Imperfect-Information Games (M.S. Thesis)

- Integrated simulated annealing with counterfactual regret minimization (CFR), introducing temperature scheduling to improve theoretical time complexity of regret-value convergence for approximate Nash equilibrium in double games.
- Combined Deep Monte Carlo methods and simulated annealing for Doudizhu, incorporating residual networks to enhance stability, stochastic prioritized sampling to improve sample efficiency, and multi-agent learning to strengthen actor performance. **Impact:** Achieved a 54.4% win rate vs. the SOTA DouZero algorithm; won Champion at the China Computer Game Championship (Doudizhu & Mahjong, 2022).

- Formalize the framework as Adversarial Team Decentralized Partially Observable Stochastic Games (AT-Dec-POSG), with applications to DouDizhu and option execution. Manuscript in preparation for submission to NeurIPS 2026.

Key Laboratory for Quantum Optics and Fine Mechanics, CAS *2017 – 2020*
Advised by Prof. Wenlin Gong — Computational Physics & Ghost Imaging

- Developed theoretical models and performed simulations to evaluate how light-source fluctuations affect computational ghost imaging (CGI), proposing real-time correction methods that improved image quality significantly under unstable lighting conditions.
- Created and optimized the GISCNL algorithm for single-detector color ghost imaging, integrating sparsity constraints and non-local self-similarity, achieving superior image quality with fewer measurements.
- Developed a super-resolution imaging technique surpassing the diffraction limit via sparsity-constrained optimization and sparse speckle illumination, enabling stable reconstructions at SNR < 10 dB.

Selected publications:

- C. Wang, W. Gong, et al., "Influence of Receiving Numerical Aperture and Rough Target Size on Ghost Imaging via Sparsity Constraint," *Chinese Laser*, 2019, 46(08):270–275.
- P. Wang, L. Wei, C. Wang, et al., "Super-resolution imaging via sparsity constraint and sparse speckle illumination," *Chinese Physics B* 27(7), 074202 (2018).
- P. Wang, C. Wang, et al., "Color ghost imaging via sparsity constraint and non-local self-similarity," *Chinese Optics Letters* 19, 021102 (2021).
- X. Mei, C. Wang, et al., "Influence of the source's energy fluctuation on computational ghost imaging and effective correction approaches," *Chinese Optics Letters* 18, 042602 (2020).

State Key Laboratory of Multiphase Flow in Power Engineering, XJTU *2015 – 2017*
Advised by Prof. Guanghui Su — Computational Physics & Nuclear Engineering

- Coupled FEM and FDM simulation of high-temperature heat-pipe startup dynamics with Cotter's limit theory validation, demonstrating successful thermal radiator performance for space reactor applications.

Selected publications:

- Wang Chenglong, Hu Lingwen, Qiu Suizheng, Su Guanghui, et al., "Uncertainty Analysis of Transportable Fluoride-Salt-Cooled High Temperature Reactor (TFHR)," *Nuclear Power Engineering* 38(3), 168–171 (2017).
- Zhang Wenwen, Wang Chenglong, et al., "Thermal Safety Analysis of New Type Heat Pipe Reactor Core," *Atomic Energy Science and Technology* 51(5), 822–827 (2017).