

# Shuai Li (李帅)

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## Position

**John Hopcroft Center, Shanghai Jiao Tong University**

Tenure-track Associate Professor

Jan 2023 - now

Tenure-track Assistant Professor

Sep 2019 - Jan 2023

## Education

- 2019     The Chinese University of Hong Kong (PhD in Computer Science & Engineering)  
           Supervisor: Prof. Kwong-Sak Leung
- 2015     University of Chinese Academy of Sciences (Master's Degree in Math)  
           Institute of Mathematics, Supervisor: Prof. Liming Ge
- 2011     Zhejiang University (Bachelor's Degree in Math)  
           Chu Kochen Honors College (GPA: 3.92/4.00)

## Awards

- 2023     Notable reviewer for ICLR-2023
- 2022     Top Reviewer for UAI-2022
- 2021     Outstanding Reviewer for NeurIPS-2021 (8%)
- 2020     Shanghai Sailing Program
- 2018     Google PhD Fellowship  
           Reaching out award, Hong Kong SAR Government Scholarship  
           Student travel award in AAAI 2018, KDD 2018
- 2017     Recipient of Overseas Research Attachment Program, CUHK
- 2016     Student travel award in ICML 2016, NIPS 2016, WIML 2016
- 2012     Outstanding Student, University of Chinese Academy of Sciences
- 2011     Certificate of Excellence Chu Kochen Honors Program, Zhejiang University  
           (30/5500)

## Research Interests

Interests: Online Learning, Multi-armed Bandit Algorithms, Reinforcement Learning Algorithms

My research interest lies at reinforcement learning and multi-armed bandits and focuses on the algorithm design and the regret analysis. My current major research topics include reinforcement learning algorithms, online matching markets, online learning to rank, bandits with graph feedback and online clustering of bandits. I am also interested in deep learning theory, general theoretical learning problems and the applications for

these algorithms in recommender systems.

## **Publications**

\*Equal contribution #Corresponding author

1. Zihui Xie, Zichuan Lin, Deheng Ye, Qiang Fu, Yang Wei, and **Shuai Li**<sup>#</sup>, *Future-conditioned Unsupervised Pretraining for Decision Transformer*, ICML, 2023.
2. Canzhe Zhao, Yanjie Ze, Jing Dong, Baoxiang Wang, **Shuai Li**<sup>#</sup>, *DPMAC: Differentially Private Communication for Cooperative Multi-Agent Reinforcement Learning*, IJCAI, 2023.
3. Qizhi Li<sup>\*</sup>, Xubin Zheng<sup>\*</sup>, Jize Xie<sup>\*</sup>, Ran Wang, Mengyao Li, Man-Hon Wong, Kwong-Sak Leung, **Shuai Li**, Qingshan Geng, Lixin Cheng, *bvnGPS: a generalizable diagnostic model for acute bacterial and viral infection using integrative host transcriptomics and pretrained neural networks*, Bioinformatics [J], 2023.
4. Canzhe Zhao, Ruofeng Yang, Baoxiang Wang, **Shuai Li**<sup>#</sup>, *Learning Adversarial Linear Mixture Markov Decision Processes with Bandit Feedback and Unknown Transition*, ICLR, 2023.
5. Yichi Zhou, Fang Kong, **Shuai Li**, *Stochastic No-Regret Learning for General Games with Variance Reduction*, ICLR, 2023.
6. Qizhi Li<sup>\*</sup>, Canzhe Zhao<sup>\*</sup>, Tong Yu, Junda Wu, **Shuai Li**<sup>#</sup>, *Clustering of Conversational Bandits with Posterior Sampling for User Preference Learning and Elicitation*, User Modeling and User-Adapted Interaction (UMUAI) [J], 2023.
7. Fang Kong, Jize Xie, Baoxiang Wang, Tao Yao, **Shuai Li**<sup>#</sup>, *Online Influence Maximization under Decreasing Cascade Model*, AAMAS, 2023.
8. Rui Zhao<sup>\*</sup>, Xu Liu<sup>\*</sup>, Yizheng Zhang<sup>\*</sup>, Minghao Li, Cheng Zhou, **Shuai Li** and Lei Han<sup>#</sup>, *CraftEnv: A Flexible Collective Robotic Construction Environment for Multi-Agent Reinforcement Learning*, AAMAS, 2023.
9. Ruofeng Yang, Xiangyuan Li, Bo Jiang, **Shuai Li**<sup>#</sup>, *Understanding Representation Learnability of Nonlinear Self-Supervised Learning*, AAAI, 2023.
10. Zhiyong Wang, Xutong Liu, **Shuai Li**<sup>#</sup>, John C.S. Lui, *Efficient Explorative Key-term Selection Strategies for Conversational Contextual Bandits*, AAAI, 2023.
11. Junda Wu, Rui Wang, Handong Zhao, Ruiyi Zhang, Chaochao Lu, **Shuai Li**, Ricardo Henao, *Few-Shot Composition Learning for Image Retrieval with Prompt Tuning*, AAAI, 2023.
12. Weiwen Liu<sup>\*</sup>, Yunjia Xi<sup>\*</sup>, Jiarui Qin, Xinyi Dai, Ruiming Tang<sup>#</sup>, **Shuai Li**, Weinan Zhang and Rui Zhang<sup>#</sup>, *Personalized Diversification for Neural Re-ranking in Recommendation*, ICDE, 2023.
13. Canzhe Zhao, Yanjie Ze, Jing Dong, Baoxiang Wang, **Shuai Li**<sup>#</sup>, *Differentially Private Temporal Difference Learning with Stochastic Nonconvex-Strongly-Concave Optimization*, Proceedings of the 16th ACM International Conference on Web Search and Data Mining (WSDM), 2023.
14. Fang Kong, **Shuai Li**<sup>#</sup>, *Player-optimal Stable Regret for Bandit Learning in Matching Markets*, ACM-SIAM Symposium on Discrete Algorithms (SODA), 2023.
15. Zihui Xie, Handong Zhao, Tong Yu, **Shuai Li**<sup>#</sup>, *Discovering Low-rank Subspaces for Language-agnostic Multilingual Representations*, Proceedings of the 2022

- Conference on Empirical Methods in Natural Language Processing (EMNLP), 2022.
16. Junda Wu, Rui Wang, Tong Yu<sup>#</sup>, Ruiyi Zhang, Handong Zhao, **Shuai Li**, Ricardo Henao, Ani Nenkova, *Context-aware Information-theoretic Causal De-biasing for Interactive Sequence Labeling*, Findings of Empirical Methods in Natural Language Processing (EMNLP), 2022.
  17. Zilong Wang, Liya Guo, Junming Yin and **Shuai Li**<sup>#</sup>, *Bandit Learning in Many-to-One Matching Markets*, Proceedings of the 31st ACM International Conference on Information & Knowledge Management (CIKM), 2022.
  18. Jinhang Zuo, Songwen Hu, Tong Yu, **Shuai Li**<sup>#</sup>, Handong Zhao and Carlee Joe-Wong, *Hierarchical Conversational Preference Elicitation with Bandit Feedback*, Proceedings of the 31st ACM International Conference on Information & Knowledge Management (CIKM), 2022.
  19. Yong Zhuang, Tong Yu, Junda Wu, Shiqu Wu, **Shuai Li**<sup>#</sup>, *Spatial-Temporal Aligned Multi-Agent Learning for Visual Dialog Systems*, The 30th ACM International Conference on Multimedia (MM), 2022.
  20. Xutong Liu, Haoru Zhao, Tong Yu, **Shuai Li**<sup>#</sup>, John C.S. Lui, *Federated Online Clustering of Bandits*, The 38th Conference on Uncertainty in Artificial Intelligence (UAI), 2022.
  21. Fang Kong, Yichi Zhou, **Shuai Li**<sup>#</sup>, *Simultaneously Learning Stochastic and Adversarial Bandits with General Graph Feedback*, The 39th International Conference on Machine Learning (ICML), 2022.
  22. Fang Kong, Junming Yin, **Shuai Li**<sup>#</sup>, *Thompson Sampling for Bandit Learning in Matching Markets*, The 31st International Joint Conference on Artificial Intelligence (IJCAI), 2022.
  23. Junda Wu<sup>\*</sup>, Zhihui Xie<sup>\*</sup>, Tong Yu, Handong Zhao, Ruiyi Zhang and **Shuai Li**<sup>#</sup>, *Dynamics-Aware Adaptation for Reinforcement Learning Based Cross-Domain Interactive Recommendation*, The 45th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR), 2022.
  24. Kun Wang, Jing Dong, Baoxiang Wang, **Shuai Li**, *Cascading Bandit under Differential Privacy*, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2022.
  25. Anirban Santara, Gaurav Aggarwal, **Shuai Li**, Claudio Gentile, *Learning to Plan Variable Length Sequences of Actions with a Cascading Bandit Click Model of User Feedback*, The 25th International Conference on Artificial Intelligence and Statistics (AISTATS), 2022.
  26. Canzhe Zhao, Tong Yu, Zhihui Xie, **Shuai Li**<sup>#</sup>, *Knowledge-aware Conversational Preference Elicitation with Bandit Feedback*, The Web Conference (WWW), 2022.
  27. Cheng Chen, Canzhe Zhao, **Shuai Li**<sup>#</sup>, *Simultaneously Learning Stochastic and Adversarial Bandits under the Position-based Model*, The 36th AAAI Conference on Artificial Intelligence (AAAI), 2022.
  28. Jing Dong, Ke Li, **Shuai Li**, Baoxiang Wang<sup>#</sup>, *Combinatorial Bandits under Strategic Manipulations*, The 15th ACM International Conference on Web Search and Data Mining (WSDM), 2022.

29. Fang Kong, Yueran Yang, Wei Chen, **Shuai Li**<sup>#</sup>, *The Hardness Analysis of Thompson Sampling for Combinatorial Semi-bandits with Greedy Oracle*, Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS), 2021.
30. Houshuang Chen, Zengfeng Huang, **Shuai Li**, Chihao Zhang (alphabetical order), *Understanding Bandits with Graph Feedback*, Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS), 2021.
31. Fang Kong, Yueran Yang, Wei Chen, **Shuai Li**<sup>#</sup>, *Combinatorial online learning based on optimizing feedbacks* (in Chinese), Big Data Research, 2021.
32. Yueran Yang\*, Yu Zhang\*, **Shuai Li**, Xubin Zheng, Man Hon Wong, Kwong-Sak Leung, Lixin Cheng, *A robust and generalizable immune-related signature for sepsis diagnostics*, IEEE/ACM Transactions on Computational Biology and Bioinformatics (TCBB), 2021.
33. Junda Wu\*, Canzhe Zhao\*, Tong Yu, Jingyang Li, **Shuai Li**<sup>#</sup>, *Clustering of Conversational Bandits for Coarse-to-Fine Grained Preference Elicitation*, Proceedings of the 30th ACM International Conference on Information & Knowledge Management (CIKM), 2021.
34. Junda Wu, Tong Yu, **Shuai Li**<sup>#</sup>, *Deconfounded and Explainable Interactive Vision-Language Retrieval of Complex Scenes*, Proceedings of the 29th ACM International Conference on Multimedia (MM), 2021.
35. Zhihui Xie, Tong Yu, Canzhe Zhao, **Shuai Li**<sup>#</sup>, *Comparison-based Conversational Recommender System with Relative Bandit Feedback*, The 44th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR), 2021.
36. Jianghao Lin, Weiwen Liu, Xinyi Dai, Weinan Zhang, **Shuai Li**, Ruiming Tang, Xiuqiang He, Jianye Hao and Yong Yu, *A Graph-Enhanced Click Model for Web Search*, The 44th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR), 2021.
37. Xinyi Dai, Jianghao Lin, Weinan Zhang, **Shuai Li**, Weiwen Liu, Ruiming Tang, Xiuqiang He, Jianye Hao, Jun Wang and Yong Yu, *A Generative Adversarial Click Model for Information Retrieval*, The Web Conference (WWW), 2021.
38. **Shuai Li**<sup>#</sup>, Fang Kong, Kejie Tang, Qizhi Li, Wei Chen, *Online influence maximization under linear threshold model*, Thirty-fourth Conference on Neural Information Processing Systems (NeurIPS), 2020.
39. Fang Kong, Qizhi Li, **Shuai Li**<sup>#</sup>, *A Survey on Online Influence Maximization* (in Chinese), Computer Science, 2020.
40. Baoxiang Wang, **Shuai Li**, Jiajin Li, Siu On Chan, *The Gambler's Problem and Beyond*, the International Conference on Learning Representations (ICLR), 2020.
41. **Shuai Li**, Wei Chen, Zheng Wen, Kwong-Sak Leung, *Stochastic Online Learning with Probabilistic Feedback Graph*, the 34th AAAI Conference on Artificial Intelligence (AAAI), 2020.
42. Ran Wang, **Shuai Li**, Lixin Cheng, Man-Hon Wong, Kwong-Sak Leung, *Predicting Associations among Drugs, Targets and Diseases by Tensor Decomposition for Drug Repositioning*, BMC Bioinformatics, 2019.
43. Pengfei Liu, Hongjian Li, **Shuai Li**, Kwong-Sak Leung, *Improving Prediction of*

- Phenotypic Drug Response on Cancer Cell Lines Using Deep Convolutional Network*, BMC Bioinformatics, 2019.
44. **Shuai Li**, Wei Chen, S Li, Kwong-Sak Leung, *Improved Algorithm on Clustering of Bandits*, the 28th International Joint Conference on Artificial Intelligence (IJCAI), 2019.
  45. **Shuai Li**, Tor Lattimore, Csaba Szepesvari, *Online Learning to Rank with Features*, the 36th International Conference on Machine Learning (ICML), 2019.
  46. Tor Lattimore, Branislav Kveton, **Shuai Li**, Csaba Szepesvai, *TopRank: A Practical Algorithm for Online Stochastic Ranking*, the 32nd Conference on Neural Information Processing Systems (NeurIPS), 2018.
  47. Ran Wang, **Shuai Li**, Man-Hon Wong, and Kwong-Sak Leung, *Drug-Protein-Disease Association Prediction and Drug Repositioning Based on Tensor Decomposition*, IEEE International Conference on Bioinformatics and Biomedicine (BIBM), 2018.
  48. **Shuai Li**, Yasin Abbasi-Yadkori, Branislav Kveton, S. Muthukrishnan, Vishwa Vinay, Zheng Wen, *Offline Evaluation of Ranking Policies with Click Models*, the 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining (KDD Research Track), 2018.
  49. Weiwen Liu, **Shuai Li**, Shengyu Zhang, *Contextual Dependent Click Bandit Algorithm for Web Recommendation*, International Computing and Combinatorics Conference (COCOON), pp. 39-50, Springer, Cham, 2018.
  50. **Shuai Li**, Shengyu Zhang, *Online Clustering of Contextual Cascading Bandits*, the 32nd AAAI Conference on Artificial Intelligence (AAAI), 2018.
  51. **Shuai Li**, Baoxiang Wang, Shengyu Zhang, Wei Chen, *Contextual Combinatorial Cascading Bandits*, the 33rd International Conference on Machine Learning (ICML), pp. 1245-1253. 2016.
  52. Pengfei Liu, **Shuai Li**, Weiying Yi, Kwong-Sak Leung, *A Hybrid Distributed Framework for SNP Selections*, the 22nd International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA), 2016.
  53. **Shuai Li**, Xiaoqian Xu, Guojin Wang, *Design for Triangular Rational Bézier Harmonic and Biharmonic Surfaces* (in Chinese), Journal of Zhejiang University (Science Edition), 2012(2):152-158.

## **Patents**

- **Shuai Li**, Zheng Wen, Yasin Abbasi-Yadkori, Vishwa, Vinay, Branislav Kveton, *Training and Utilizing Item-level Importance Sampling Models for Offline Evaluation and Execution of Digital Content Selection Policies*, US Patent 20190303995A1.

## **Internships & Research Experiences**

- 2018.9-2019.2 Research Intern of Prof. Tong Zhang and Dr. Lei Han at Tencent AI Lab, Shenzhen, China.
- 2018.4.30-8.31 Research Intern of Prof. Csaba Szepesvari and Dr. Tor Lattimore on the topic of contextual online learning to rank at DeepMind, London, UK.

- 2017.6.5-11.10 Data Science Research Intern of Dr. Branislav Kveton on the topic of offline evaluation for ranking policies with click models at Adobe, San Jose, CA, US.
- 2017.1.16-5.6 Visiting student in the program of Foundation of Machine Learning, Simons institute, University of California Berkeley, CA, US.
- 2016.10-2018.5 Research collaborations with Prof. Bogdan Cautis of Noah's Ark Lab of Huawei and Prof. Shengyu Zhang of CUHK on contextual bandits.
- 2016.8.22-26 Attended the Algorithms and Uncertainty Boot Camp of Simons Institute, University of California, Berkeley, US.
- 2016.6.27-2016.8.21 Research assistant with Prof. Csaba Szepesvari of University of Alberta, Canada, on the generalized linear bandits.
- 2015.4-6 Visited Dr. Wei Chen of Microsoft Research Asia, Beijing, on the multi-armed bandit problem.
- 2014.11-2015.4 Research Assistant with Prof. Shengyu Zhang in the Chinese University of Hong Kong on the multi-armed bandit problem.
- 2013.8-2014.5 Teaching Assistant with Prof. Liming Ge in the University of New Hampshire, US.

## **Professional Services**

Conference reviewer:

International Conference on Machine Learning (ICML) 2023-2019  
 International Conference on Learning Representations (ICLR) 2023-2021  
 Conference on Neural Information Processing Systems (NeurIPS) 2022-2018  
 AAAI Conference on Artificial Intelligence (AAAI) 2023, 2021-2020, 2018  
 Conference on Uncertainty in Artificial Intelligence (UAI) 2023-2019  
 International Conference on Artificial Intelligence and Statistics (AISTATS) 2023-2022, 2020  
 International Joint Conference on Artificial Intelligence (IJCAI) 2023  
 International Conference on Autonomous Agents and Multiagent Systems (AAMAS) 2023-2021

Journal reviewer:

IEEE Transactions on Neural Networks and Learning Systems (TNNLS) 2022-2021  
 ACM Transactions on Intelligent Systems and Technology (TIST) 2022  
 Journal of Information Science and Engineering (JISE) 2022  
 Production and Operations Management (POM) 2022-2021  
 Manufacturing and Service Operations Management (MSOM) 2021  
 Journal of Global Optimization (JOGO) 2021  
 IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI) 2020  
 IEEE Journal on Selected Areas in Information Theory (JSAT) 2020  
 Machine Learning

Conference subreviewer:

SODA 2021, ICALP 2020

Other reviews:

Reinforcement Learning for Real Life Workshop (at ICML 2021)

Machine Learning Special Issue on Reinforcement Learning for Real Life 2020  
 Conference sub-reviewer for ISAAC-2019, IJCAI-2018, ICML-2018, UAI-2018, AAAI-2019, BIBM-2018, AISTATS-2018  
 International Conference on Neural Computation Theory and Applications (NCTA) 2019  
 Ubicomp Workshop on Continual and Multimodal Learning for Internet of Things (CML-IoT 2019)  
 Journal reviewer for TCS 2017, PALADYN 2018, JSDT 2018  
 Journal sub-reviewer for IEEE SIPN 2018

## **Teaching Experience**

At SJTU

- 2023 AI3601 Reinforcement Learning (undergraduate)  
 CS3308 Machine Learning (undergraduate, co-instructed)
- 2022 CS3317 Artificial Intelligence (undergraduate)  
 CS3330 Combinatorics (undergraduate, co-instructed)
- 2021 CS410 Artificial Intelligence (undergraduate)  
 CS445 Combinatorics (undergraduate)
- 2020 CS410 Artificial Intelligence (undergraduate)  
 CS445 Combinatorics (undergraduate)
- 2019 VE445 Introduction to Machine Learning (undergraduate)

At CUHK

- 2019 Probability and Statistics for Engineers  
 (undergraduate-level, TA, Prof. Andrej Bogdanov)
- 2018 Fundamentals of Artificial Intelligence  
 (undergraduate-level, TA, Prof. Kwong-Sak Leung)  
 Compiler Construction (undergraduate-level, TA, Dr. YUAN Cheng Jun)
- 2016 Probability and Statistics for Engineers  
 (undergraduate-level, TA, Prof. Shengyu Zhang)  
 Randomness and Computation (graduate-level, TA, Prof. Shengyu Zhang)
- 2015 Analysis of Boolean Functions (graduate-level, TA, Prof. Shengyu Zhang)  
 Topics in Theoretical Computer Science  
 (graduate-level, TA, Prof. Shengyu Zhang)

At UNH

- 2014 Calculus II (undergraduate-level, TA, Prof. Donald W Hadwin)
- 2013 Calculus I (undergraduate-level, TA, Prof. Liming Ge)