SHUYUE HU

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RESEARCH INTERESTS

Multi-Agent Systems, Game Theory, (Multimodal) Large Language Models, Reinforcement Learning

EDUCATION

Chinese University of Hong Kong   Aug 2015 - Dec 2019
Ph.D. in Computer Science and Engineering   *Hong Kong, China*
Advisor: Prof. Ho-fung Leung

South China University of Technology   Sep 2011 - Jul 2015
B.Eng in Software Engineering   *Guangzhou, China*

EMPLOYMENT

Shanghai Artificial Intelligence (or Pujiang National) Laboratory   May 2022 - present
Researcher in AI Theory   *Shanghai, China*

Singapore University of Technology and Design   Dec 2021 - May 2022
Postdoctoral Research Fellow   *Singapore, Singapore*
Advisor: Prof. Georgios Piliouras

National University of Singapore   Dec 2019 - Dec 2021
Postdoctoral Research Fellow   *Singapore, Singapore*
Advisor: Prof. Harold Soh

PUBLICATIONS

* denotes (co-)corresponding author.

1. P.D. Li, S.X. Li, C. Yang, X.R. Wang, <u>S.Y. Hu</u>, X. Huang, H. Chan and B. An, "Configurable Mirror Descent: Towards a Unification of Decision Making," ICML 2024.

2. S.Y. Ren, Z.Y. Cui, R.Q. Song, Z. Wang and <u>S.Y. Hu</u>*, "Emergence of Social Norms in Generative Agent Societies: Principles and Architecture," IJCAI 2024.

3. Z. Wang, Z.H. Cao, J. Shi, P.C. Zhu, <u>S.Y. Hu</u>* and C. Chu, "A Successful Strategy for Multichannel Iterated Prisoner's Dilemm," IJCAI 2024.

4. C.W. Leung, <u>S.Y. Hu</u>* and H.F. Leung, "The Stochastic Evolutionary Dynamics of Softmax Policy Gradient in Games," AAMAS 2024.

5. <u>S. Y. Hu</u>, H. Soh and G. Piliouras, "The Best of Both Worlds in Network Population Games: Reaching Consensus and Convergence to Equilibrium," NeurIPS 2023.

6. H. Guo, C. Shen, <u>S.Y. Hu</u>, J. L. Xing, P. Tao, Y. C. Shi, and Z. Wang, "Facilitating Cooperation in Human-Agent Hybrid Populations through Autonomous Agents," iScience 2023.

7. C. Shen, H. Guo, <u>S.Y. Hu</u>, L. Shi, Z. Wang and J. Tanimoto, "How committed individuals shape social dynamics: A survey on coordination games and social dilemma games," EPL 2023.

8. 郝建业, 邵坤, 李凯, 李栋, 毛航宇, <u>胡舒悦</u>, 王震. "博弈智能的研究与应用," 中国科学: 信息科学 2023.

9. C. Chu, Z. Yuan, <u>S. Y. Hu</u>*, C. J. Mu and Z. Wang, "A Pair-Approximation Method for Modelling the Dynamics of Multi-Agent Stochastic Games," AAAI 2023.

10. Z. Wang, Z. Song, C. Shen and <u>S. Y. Hu</u>*, "Emergence of Punishment in Social Dilemma with Environmental Feedback," AAAI 2023.

11. C.X. Zhu, Y. Cai, <u>S.Y. Hu</u>*, H. F. Leung and D. Chiu, "Learning by Reusing Previous Advice: A Memory-Based Teacher-Student Framework", JAAMAS 2023.

12. <u>S. Y. Hu</u>, C. W. Leung, H. F. Leung and H. Soh, "The Dynamics of Q-learning in Population Games: a Physics-Inspired Continuity Equation Model," AAMAS 2022.

13. Y. Chen, L.B. Zhang, J.M. Liu, and <u>S. Y. Hu</u>, "Individual-Level Inverse Reinforcement Learning for Mean Field Games," AAMAS 2022.

14. C. W. Leung, <u>S. Y. Hu</u>* and H. F. Leung, "Modelling the dynamics of multi-agent Q-learning: the stochastic effects of local interaction and incomplete information", IJCAI 2022.

15. Z. Wang, C. J. Mu, <u>S. Y. Hu</u>, C. Chu and X. L. Li, "Modelling the Dynamics of Regret Minimization in Large Agent Populations: a Master Equation Approach", IJCAI 2022.

16. C. Chu, Y. Li, J.Z. Liu, <u>S. Y. Hu</u>, X. L. Li and Z. Wang, "A Formal Model for Multiagent Q-Learning Dynamics on Regular Graphs," IJCAI 2022.

17. <u>S. Y. Hu</u>, C. W. Leung, H. F. Leung and J. M. Liu, "Gist Trace-based Learning: Efficient Convention Emergence from Multilateral Interactions," TAAS 2021.

18. C. W. Leung, <u>S. Y. Hu</u> and H. F. Leung, "Formal Modeling of Multi-Agent Reinforcement Learning with Many Agents through Local Interaction," ICTAI 2021.

19. C. X. Zhu, H. F. Leung, <u>S. Y. Hu</u> and Y. Cai, "A Q-values Sharing Framework for Multiple Reinforcement Learning under Budget Constraint," TAAS 2021.

20. C. W. Leung, <u>S. Y. Hu</u> and H. F. Leung, "Self-Play or Group Practice: Learning to Play Alternating Markov Game in Multi-Agent System," ICPR 2020.

21. C. X. Zhu, Y. Cai, H. F. Leung and <u>S. Y. Hu</u>, "Learning by Reusing Previous Advice in Teacher-Student Paradigm," AAMAS 2020.

22. <u>S. Y. Hu</u>, C. W. Leung and H. F. Leung, "Modelling the Dynamics of Multiagent Q-Learning in Repeated Symmetric Games: a Mean Field Theoretic Approach," NeurIPS 2019.

23. <u>S. Y. Hu</u>, C. W. Leung, H. F. Leung and J. M. Liu, "To be Big Picture Thinker or Detail- Oriented? Utilizing Perceived Gist Information to Achieve Efficient Convention Emergence with Bilateralism and Multilateralism (Extended Abstract)," AAMAS 2019.

24. C. X. Zhu, H. F. Leung, <u>S. Y. Hu</u> and Y. Cai, "A Q-values Sharing Framework for Multiple Independent Q-learners (Extended Abstract)," AAMAS 2019.

25. C. W. Leung, <u>S. Y. Hu</u>, and H. F. Leung, "Modelling Convention Emergence by Observation with Memorization," PRICAI 2019.

26. <u>S. Y. Hu</u> and H. F. Leung, "Compromise as a Way to Promote Convention Emergence and to Reduce Social Unfairness in Multi-Agent Systems," AJCAI 2018.

27. <u>S. Y. Hu</u> and H. F. Leung, "Do Social Norms Emerge? the Evolution of Agents' Decisions with the Awareness of Social Values under Iterated Prisoner's Dilemma," SASO 2018.

28. <u>S. Y. Hu</u> and H. F. Leung, "Achieving Coordination in Multi-Agent Systems by Stable Local Conventions under Community Networks," IJCAI 2017.

29. <u>S. Y. Hu</u> and H. F. Leung, "Local Norm Phenomena in Multi-Agent Systems under Community Networks (Extended Abstract)," AAMAS 2017.

ACADEMIC SERVICE

- Scholarship Chair and Area Chair of AAMAS 2024
- (Senior) PC Member of AAMAS, NeurIPS, ICML, ICLR, ECAI
- Reviewer of AIJ, JAAMAS, IEEE TETCI, Physics of Life Review, Scientific Reports

TEACHING EXPERIENCE

- Advanced Topics in Game Theory (Fall 2015, Fall 2017, Fall 2018)
- Open-Source Software Project Development (Spring 2018)
- Introduction to Data Structures (Spring 2017)
- Introduction to Programming in Java (Fall 2016)
- Linear Algebra and Vector Calculus (Spring 2016)

HONORS AND AWARDS

- Shanghai Overseas High-level Young Talents, 2023
- ICML Outstanding Reviewers (top 10%), 2022
- NeurIPS Travel Award, 2019
- Teaching Assistant of Merits, Department of Computer Science & Engineering, CUHK, 2016
- Postgraduate Studentship, CUHK, 2015-2019