Hanping Xu

Last updated: July 22, 2022
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Personal Data

Citizenship and Year of Birth: Chinese | 1996
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Education

2018-Present Ph.D. in Mathematical Economics, **National University of Singapore** (NUS), Singapore
Advisor: Prof. Yeneng Sun GPA: 4.89/5.0

2014-2018 B.S. in Science with Honors degree, **Sun Yat-sen University** (SYSU), Guangzhou, China
Major: Statistics

Research interests

Economic Theory, Game Theory, Mathematical Economics

Publication

Pareto-undominated and socially-maximal Nash equilibria with coarser traits (with Bin Wu), Economics Letters, 215 (2022): 110464.

Working Papers

Equilibrium convergence in large games (the link provided here is connected to the earlier version)
with Enxian Chen and Bin Wu
Abstract: This paper studies the relationship between the randomized strategy Nash equilibrium in games with a continuum of players (i.e., large games) and the equilibrium in finite-player games. In particular, we show that if a sequence of finite-player games converges to a large game, then (i) the limit of any sequence of (approximate) equilibria distribution of corresponding finite-player game is an equilibrium distribution in the large game; (ii) any equilibrium in the large game induces an obvious symmetric approximate equilibrium in finite-player game as long as a continuity condition holds. These results show that large games provide a good approximate for large finite-player games. Applications in (atomic and atomless) congestion games are also presented.

Games with incomplete information: a general purification result
with Wei He and Yeneng Sun
Abstract: We present a new purification result for Bayesian games with countably many actions, interdependent payoffs and correlated types. It is shown that the condition of coarser inter-player information characterizes the existence of purification, and also the existence of pure strategy equilibrium in these games. We demonstrate that the condition of countably many actions is tight for the purification result and pure strategy equilibrium existence. To prove the results for Bayesian games, we provide a general purification principle, which covers various earlier results as special cases.

Large games with coarser traits and countable actions
Abstract: We show that the coarser traits condition is both necessary and sufficient for the idealized limit property of large games with traits and countable actions. Meanwhile, we also show that the coarser traits condition is both necessary and sufficient for the existence of pure strategy Pareto-undominated socially-maximal Nash equilibria in large games with traits and countable actions. We demonstrate that the condition of countably many actions is tight.

Does randomization matter in dynamic games?
with Enxian Chen, Wei He, and Yeneng Sun
Abstarct: This paper investigates mixed strategies in dynamic games with perfect information. We present an example to demonstrate that players may obtain higher payoffs by playing mixed strategies. By contrast, the main result of the paper shows the no-mixing property for two-player dynamic zero-sum games, implying that mixed strategy is unnecessary in this classical and widely adopted class of games. As for applications, we show the existence of pure-strategy subgame-perfect equilibria in two-player zero-sum games with nature. Based on the main result, we also prove the existence of a universal subgame-perfect equilibrium that can induce all the pure-strategy subgame-perfect equilibria in such games. A generalization of the main result for multiple players and some further results are also discussed.

Teaching Experience

National University of Singapore	MA4264: Game Theory	2021/2022 SEM 2
	MA4264: Game Theory	2020/2021 SEM 2
	MA3238: Stochastic Processes I	2019/2020 SEM 2
	MA2216: Probability	2019/2020 SEM 1
Teaching evaluation score	4.3/5.0 for Game Theory	4.1/5.0 for Stochastic Process I

Presentations

Society for the Advancement of Economic Theory (SAET) 2022 Conference
Presenter for "Equilibrium convergence in large games"

Society for the Advancement of Economic Theory (SAET) 2021 Conference
Presenter for "Games with incomplete information: a general purification result"

Selected Scholarships, Honors and Awards

Research Scholarships, National University of Singapore	2019, 2020, 2021, 2022
Top Graduate Tutor, Department of Mathematics, National University of Singapore	2021
Outstanding Graduate Award, Sun Yat-sen University	2018
National Scholarships, China	2015, 2016, 2017
The First Prize Scholarships, Sun Yat-sen University	2015, 2016, 2017

Reviewer for Journal

Journal of Mathematical Economics

References

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