Hanping Xu

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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

Obvious approximate symmetric equilibrium in games with many players (the link provided here is connected to the earlier version)
with Enxian Chen and Bin Wu
This paper was selected for the Forum on Micro Theory of Economic Research Journal.
Abstract: The model of large games was introduced in the literature as an idealized approximation of games with many players. Such an approximation could be helpful in many situations as it may simplify the game model as well as the equilibrium characterization. As a result, whether such an approximation provides a reasonable approximation for large finite games becomes a fundamental question in the theory of large games. Various papers have (partly) answered this question by studying the closed graph property of the equilibrium correspondence. In this paper, we investigate this question from a new angle and show that given a sequence of finite-player games that converges to a large game, then any Nash equilibrium in the large game directly induces an obvious approximate symmetric equilibrium in each finite-player game as long as a continuity condition holds. As a counterpart, we also show that the limit of any convergent sequence of (approximate) Nash equilibria of the corresponding finite-player game is a Nash equilibrium in the limit large game, which extends the existing results on closed graph property in the literature. Applications in 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 Sequential Games?(the link provided here is connected to the earlier version)
with Enxian Chen, Wei He, and Yeneng Sun
Abstract: We provide an example to demonstrate that randomization matters in sequential games in the sense that players may obtain higher equilibrium payoffs by playing mixed strategies. In contrast, we present a fundamental property for the classic two-player zero-sum sequential games (such as chess and go), showing that realizations of mixed-strategy subgame perfect equilibria (SPE) induce pure-strategy SPEs with the same payoffs. As an application, we show a new existence result on pure-strategy SPE in such games. A universal SPE that induces all the pure-strategy SPE is constructed. Finally, we prove that the above fundamental property holds generically in sequential games.

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

REFERENCES

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