

# Hanping Xu

Last updated: October 31, 2022

S17 #06-15, 119076, Department of Mathematics, National University of Singapore

## PERSONAL DATA

---

CITIZENSHIP AND YEAR OF BIRTH: Chinese | 1996

EMAIL: [e0321212@u.nus.edu](mailto:e0321212@u.nus.edu)

HOMEPAGE: <https://maimaidou.github.io/HanpingXu.github.io/>

## 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: A symmetric equilibrium in a large game with a convergent sequence of finite-player games can induce a strategy profile for each finite-player game in the sequence in an obvious way. We show that such obviously induced strategy profiles form approximate symmetric equilibria for the sequence of finite-player games under a continuity assumption. This result demonstrates from a new angle that large games serve as a reasonable idealization for games with large but finitely many players. Furthermore, we show that for a large game with a convergent sequence of finite-player games, the limit distribution of any convergent sequence of (randomized) approximate equilibria in the corresponding finite-player games is induced by a symmetric equilibrium in the limit large game. Various results in the earlier literature on the relevant closed graph property in the case of pure strategies can be unified under such a general convergence result. 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

---

<i>National University of Singapore</i>	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
<i>Teaching evaluation score</i>	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

---

Professor [Yeneng Sun](#)

Departments of economics and mathematics

National University of Singapore

Tel: +65 6516 3994

Email: [ynsun@nus.edu.sg](mailto:ynsun@nus.edu.sg)

Associate Professor [Xiao Luo](#)

Department of economics

National University of Singapore

Tel: +65 6516 6231

Email: [ecslx@nus.edu.sg](mailto:ecslx@nus.edu.sg)

Associate Professor [Wei He](#)

Department of economics

The Chinese University of Hong Kong

Tel: (852) 3943 8196

Email: [hewei@cuhk.edu.hk](mailto:hewei@cuhk.edu.hk)