The Fourth East Asia Game Theory International Conference (EAGT2021)

and the Ninth China Game Theory International Conference (CMGTA2021)

第四届东亚博弈论会议
暨第九届中国博弈论国际会议

Online meetings /在线会议

April 24-25, 2021, Beijing, China

2021 年 4 月 24-25 日　中国北京

Program Schedule
会议手册

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1. Hosts /主办单位

East Asia Game Theory Conference Committee /东亚博弈论会议委员会
Game Theory Chapter of Operations Research Society of China /中国运筹学会博弈论分会
Beijing Operation Research Society, China /北京运筹学会

2. Organizers /组织单位

Beijing Institute of Technology, China /北京理工大学
Guizhou University, China /贵州大学
Northwestern Polytechnical University, China /西北工业大学
Beijing Jiaotong University, China /北京交通大学

3. Chairs of the Conference /会议主席

Prof. Yiming Wei, Beijing Institute of Technology, China
Prof. Yukihiko Funaki, Waseda University, Japan
Prof. Xiaoguang Yang, Academy of Mathematics and Systems Science, Chinese Academy of Sciences

4. Academic-Program Committee /会议学术委员会

Chairs
Prof. Hongwei Gao, Qingdao University, China
Prof. Youngsub Chun, Seoul National University, Korea
Prof. Satoru Takahashi, National University of Singapore, Singapore

Members
(Sorted by alphabetical order of last name)
Prof. Surajit Borkotokey, Department of Mathematics, Dibrugarh University
Prof. Biung-Ghi Ju, Seoul National University, Korea
Prof. Yuan Ju, York University, UK
Prof. Dengfeng Li, University of Electronic Science and Technology of China, China
Prof. Sanxi Li, Renming University, China
Prof. Jiuqiang Liu, Eastern Michigan University, USA
Prof. Xiao Luo, National University of Singapore
Prof. Emeritus, Shigeo Muto, Tokyo Institute of Technology, Japan
Prof. Chengzhong Qin, University of California, Santa Barbara, USA
Prof. Ning Sun, Nanjing Audit University, China
Prof. Xiang Sun, Wuhan University, China
Prof. Chunqiao Tan, Nanjing Audit University, China
Prof. Qianfeng Tang, Shanghai University of Finance and Economics, China
Prof. Xi Weng, Peking University, China
Prof. Robert Veszteg, Waseda University, Japan
Prof. Zenan Wu, Peking University, China

Prof. Kang Xie, Sun Yat-sen Business School, Guangzhou, China
Prof. Takehiko Yamato, Tokyo Institute of Technology, Japan
Prof. Zaifu Yang, York University, UK
Prof. Chun-Hsien Yeh, Academia SINICA, Taiwan, China
Prof. Ning Yu, Nanjing Audit University, China
Prof. Boyu Zhang, Beijing Normal University, China
Prof. Yongchao Zhang, Shanghai University of Finance and Economics, China
Prof. Jie Zheng, Tsinghua Univerisity, China
Junjie Zhou, National University of Singapore
Yu Zhou, Kyoto University, Japan

5. Organizing Committee /会议组织委员会

Chairs
Prof. Qiang Zhang, Beijing Institute of Technology, China
Prof. Hui Yang, Guizhou University, China
Prof. Hao Sun, Northwestern Polytechnical University, China
Prof. Zhigang Cao, Beijing Jiaotong University, China

Members
Prof. Genjiu Xu, Northwestern Polytechnical University, China
Prof. Wensheng Jia, Guizhou University, China
Prof. Chunsheng Cui, Henan University of Economics and Law, China
Prof. Yuli Zhang, Beijing Institute of Technology, China
Prof. Fanyong Meng, Central South University, China
Prof. Gaofeng Yu, Sanming University, China
Prof. Hongxia Sun, Beijing Technology and Business University, China
Prof. Cunlin Li, North Minzu University, China
Prof. Jiaosu Wu, von Neumann Institute for Mathematics and Intelligence Science of DHWL Co.
Associate Prof. Jinhui Pang, Beijing Institute of Technology, China
Associate Prof. Xiaohui Yu, Beijing Wuzi University, China
Associate Prof. Jian Lin, Fujian Agriculture and Forestry University, China
Associate Prof. Dongshuang Hou, Northwestern Polytechnical University, China
Associate Prof. Zhiwei Cui, Beihang University, China
Associate Prof. Yeming Dai, Qingdao University, China
Associate Prof. Guanghui Yang, Guizhou University, China
Assistant Prof. Bin Zhang, Beijing Institute of Technology, China
Assistant Prof. Zhengxing Zou, Beijing Jiaotong University, China

6. Keynote Speakers /大会报告专家

Yukihiko Funaki is a professor at School of Political Science and Economics of Waseda University. He was a dean of the graduate school of Economics. His main research interests are in the fields of Game Theory, Mathematical Economics, and Experimental Economics. His main research topic is to study the fairness of solutions for cooperative games and an experiment for a coalition formation. These researches have been published in journals such as the Rand Journal of Economics, Games and Economic Behavior, International Journal of Game Theory, Journal of Economic Dynamics and Control, Social Choice and Welfare, Journal of Mathematical Economics. He is a member of the editorial board of some Journals, such as Journal of Mathematical Economics, Mathematical Social Sciences, and Experimental Economics. He organized Asia-Pacific Economic Science Association in 2014 and Japanese Economic Association Annual Autumn Meeting, and was also the chair of the organizing committee of the first EAGT Conference.

Rene van den Brink is a professor at the Department of Economics at VU Amsterdam, and also a fellow at Tinbergen Institute. His main research interests are in the fields of Game Theory, Economic Theory and Networks, but also extends to other fields as Social Choice Theory, Discrete Mathematics, Operations Research and Water Allocation Problems. His main research topic is to study relational structures in economic organizations, combining Game Theory and Networks. This research resulted in about 70 publications, including journals such as Journal of Economic Theory, Games and Economic Behavior, International Journal of Game Theory, Social Choice and Welfare, Journal of Environmental Economics and Management, European Journal of Operational Research and Social Networks.

Youngsub Chun is a professor at the Department of Economics at Seoul National University. He is the director of the Advanced Strategy Program for Global Economy since 2012. He was awarded the 45th MaeKyung Economics Prize in 2015, and the Service Merit Medal awarded by the President of South Korea in 2016. His main research interests are in the fields of Game Theory, Microeconomic Theory, and Public Economics. He has done some seminal works on cooperative games, claims problems, and queueing problems. He published a monograph called Fair Queueing, which provides a detailed analysis on fair queueing rules from a normative, a strategic, and a non-cooperative viewpoint. His research has been published in journals such as Econometrica, Journal of Economic Theory, Games and Economic Behavior, Economic Theory, Energy Economics, International Journal of Game Theory, Social Choice and Welfare, Journal of Mathematical Economics, and European Journal of Operational Research. He is a co-editor of International Journal of

Economic Theory and an associate editor of Social Choice and Welfare, International Journal of Game Theory, and Journal of Public Economic Theory.

Surajit Borkotokey is a Professor at the Department of Mathematics, Dibrugarh University, Assam, India. He did his Ph.D. from Dibrugarh University. His fields of research are cooperative game theory, networks, aggregation and fuzzy set theory. An Indo-US fellow, Prof Borkotokey is interested in the axiomatic frameworks of cooperative games and their connections to aggregation and capacities. He has published over 50 research articles in journals such as Annals of Operations Research, European Journal of Operational Research, Fuzzy Sets and Systems, IEEE-Transactions on Fuzzy Systems, Information Sciences , Soft Computing, International Journal of Intelligent Systems etc. Prof Borkotokey has been currently working on a UKIERI project awarded by the British Council and the Govt. of India, with Queen's University, UK. He has edited a book entitled "Game Theory and Networks: New Horizons and Perspectives" published by Springer Nature which will be available in the market very soon.

Ning Sun is a professor and the chair of the Institute for Social and Economic Research, Nanjing Audit University. He received his PhD degree from the University of Tsukuba, and held positions at Akita Prefectural University, Shanghai Jiao Tong University, and Shanghai University of Finance and Economics. His research focuses on microeconomic theory, especially market design. He has published in leading journals including American Economic Review, Econometrica, and Journal of Political Economy. He has received numerous accolades for his contributions to economic theory, including an appointment as a Yangtze River scholar by the Ministry of Education in 2010.

Pinyan Lu is a world-famous theoretical computer scientist at Shanghai University of Finance and Economics. He is now a professor, Deputy Dean of the School of Information Management and Engineering, as well as the Director of the Institute for Theoretical Computer Science (ITCS). After finishing his Doctoral degree in Computer Science from Tsinghua University in 2009, he worked for MSRA as an Associate Researcher, Researcher and Lead Researcher, chronologically. He is interested in theoretical computing and pays attention to its interaction with other disciplines, including statistical physics in natural science and economics and social choice theory in social science. He has published over 60 articles at international conferences and in magazines, about computer science theory and gaming theory, 27 of which were published on STOC/FOCS/SODA. His articles have been awarded as Best Paper in important international conferences such as ICALP 2007, FAW 2010 and ISAAC 2010. He was Co-chairman of the Program Committee in international conferences such as FAW-AAIM 2012, WINE 2017, FAW 2018 and ISAAC 2019, and has worked as a member of program committees in top international conferences such as STOC, FOCS and ICALP, several times. His previous awards and honors are Silver Award in the 8th International Congress

of Chinese Mathematicians (ICCM, 2019), Shanghai Young Talents (2017), Young Scientist Award of CCF (2014), Microsoft Gold Star Stuff (2010), Microsoft Research Fellowship (2008), and Tsinghua Top-Grade Scholarship (2007), etc.

Junjie Zhou is currently an Associate Professor of Economics at NUS. His research focuses on social and economic networks, digital economics, and economic theory. His research work has been published in the Review of Economic Studies, Journal of Economic Theory, American Economic Journal: Microeconomics, the Economic Journal, Games and Economic Behavior, the Rand Journal of Economics, Operations Research, Manufacturing & Service Operations Management and Production and Operations Management. He is currently serving as an associate editor for International Journal of Industrial Organization, Journal of Mathematical Economics, Mathematical Social Sciences.

7. Outline for the Daily Schedule /会议日程概要

Date	Beijing Time	Contents	Speakers / Theme
April 24, Saturday	09:00-09:15	Opening Ceremony	Yukihiko Funaki,　Yiming Wei,　Xiaoguang Yang
	09:15-10:10	1st Keynote Speech	Yukihiko Funaki
	10:10-11:05	2nd Keynote Speech	Youngsub Chun
	11:05-12:00	3rd Keynote Speech	Surajit Borkotokey
	12:00-13:30	Rest	
	13:30-14:30	4th Keynote Speech	Rene van den Brink
	14:30-17:00	Parallel Session I	Market/Mechanism Design 1
	14:30-17:00	Parallel Session II	Cooperative Game 1
	14:30-17:30	Parallel Session III	Network Games
	14:30-15:30	Parallel Session IV	Applied Game Theory
	15:30-17:30	Parallel Session V	Behavioral/Experimental Game Theory
April 25, Sunday	09:00-10:00	5th Keynote Speech	Pinyan Lu
	10:00-11:00	6th Keynote Speech	Ning Sun
	11:00-12:00	7th Keynote Speech	Junjie Zhou
	12:00-13:00	Rest	
	14:00-17:00	Parallel Session I	Market/Mechanism Design 2
	14:00-16:30	Parallel Session II	Cooperative Game 2
	14:00-16:30	Parallel Session III	Noncooperative Game
	13:00-16:30	Parallel Session IV	Supplementary Session
	13:00-17:00	Parallel Session V	Chinese Session
	17:30-17:35	Closing Ceremony	Hao Sun

8. Schedule of the Conference /会议日程

April 24, the detailed arrangements about Opening Ceremony is as follows.

April 24, 09:00-09:15   Opening Ceremony

Tencent Web Site: https://meeting.tencent.com/s/13MvRkgr4P3T   **ID of meetings：880 724 597**

Date	Beijing Time	Host(Institution)	Speaker(Institution)	Titles
April 24, Saturday, Morning	09:00-09:05	Hao Sun (Northwestern Polytechnical University, China)	Yiming Wei (Beijing Institute of Technology, China)	The Address by Chair of the Conference
	09:05-09:10		Yukihiko Funaki (Waseda University, Japan)	The Address by Chair of the Conference
	09:10-09:15		Xiaoguang Yang (Chinese Academy of Sciences, China)	The Address by Chair of the Conference

April 24, the detailed arrangements about Keynote Speeches are as follows.

April 24, 09:15-12:00   Keynote Speech 1~3

Tencent Web Site: https://meeting.tencent.com/s/13MvRkgr4P3T   **ID of meetings：880 724 597**

Date	Beijing Time	Host(Institution)	Speaker(Institution)	Titles
April 24, Saturday, Morning	09:15-10:10	Hao Sun (Northwestern Polytechnical University, China)	Yukihiko Funaki (Waseda University, Japan)	Several Solutions for TU Games Based on Proportionality
	10:10-11:05	Yukihiko Funaki (Waseda University, Japan)	Youngsub Chun (Seoul National University, Korea)	The Shapley Value in Positional Queueing Problems
	11:05-12:00	Xiaohui Yu (Beijing Wuzi University, China)	Surajit Borkotokey (Dibrugarh University, India)	Consolidating Marginalism and Egalitarianism: A new Value Based on Coalition Size

April 24, 13:30-14:30   Keynote Speech 4

Tencent Web Site: https://meeting.tencent.com/s/13MvRkgr4P3T   **ID of meetings：880 724 597**

Date	Beijing Time	Host(Institution)	Speaker(Institution)	Titles
April 24, Saturday, Afternoon	13:30-14:30	Genjiu Xu (Northwestern Polytechnical University, China)	Rene van den Brink (VU, Netherlands)	Valuation Monotonicity, Fairness and Stability in Assignment Problems

April 24, the detailed arrangements about Parallel Sessions are as follows.

14:30-17:00　Parallel Session I
Tencent Web Site: https://meeting.tencent.com/s/7E4hkElfFX1r　　　**ID of meetings：337 851 165**
Host: Yu Zhou, Kyoto University, Japan
Theme: Market/Mechanism Design 1

Date	Beijing Time	Speaker(Institution)	Titles
April 24, Saturday, Afternoon	14:30-15:00	Moyuru Watanabe (Tokyo Institute of Technology, Japan)	Hepatorenal Organ Exchange
	15:00-15:30	Yu Zhou (Graduate School of Economics, Kyoto University，Japan)	Menu Mechanisms
	15:30-16:00	Jun Zhang (Nanjing Audit University, China)	Cores in Discrete Exchange Economies with Complex Endowments
	16:00-16:30	Lining Han (Wuhan University, China)	Strategy-Proof Allocations with Punishment
	16:30-17:00	Haolan Yu (University of Illinois at Chicago, USA)	A Signature Sequential Allocation Mechanism for International Environmental Agreement

14:30-17:00　Parallel Session II
Tencent Web Site: https://meeting.tencent.com/s/y6FEeGC6ESXF　　　**ID of meetings：679 498 683**
Host: Dongshuang Hou, Northwestern Polytechnical University, China
Theme: Cooperative Game 1

Date	Beijing Time	Speaker(Institution)	Titles
April 24, Saturday, Afternoon	14:30-15:00	Takaaki Abe (Waseda University, Japan)	Stable Coalition Structures and Power Indices for Majority Voting
	15:00-15:30	Qianqian Kong (Northwestern Polytechnical University, China)	Power Indices for Networks, with Applications to Matching Markets
	15:30-16:00	Zijun Li (Central South University, China)	Quasi-Owen Value for Games on Augmenting Systems with a Coalition Structure
	16:00-16:30	Guangjing Yang (Northwestern Polytechnical University, China)	A Coalitional Bargaining Game with Majority Rule
	16:30-17:00	Yang Li (Northwestern Polytechnical University, China)	Evolutionary Public Goods Game on the Bi-random Geometric Graph

14:30-17:30　Parallel Session III

Tencent Web Site: https://meeting.tencent.com/s/Y5VF8cj4UkT8　　**ID of meetings：323 514 599**

Host: Zhiwei Cui, Beihang University, China

Theme: Network Games

Date	Beijing Time	Speaker(Institution)	Titles
April 24, Saturday, Afternoon	14:30-15:00	Sihua Ding (Nankai University, China)	A Simple Model of the Power Elite
	15:00-15:30	Fanqi Shi (Peking University, China)	Screening with Network Externalities
	15:30-16:00	Xueheng Li (Nanjing Audit University, China)	Designing Weighted and Directed Networks under Complementarities
	16:00-16:30	Yang Sun （Sichuan University, China）	Myopic Formation of Nnetworks
	16:30-17:00	Loyimee Gogoi (Northwestern Polytechnical University China）	Consistency and Converse Consistency in Network Games
	17:00-17:30	Chen Wang (Qingdao University, China)	Opinion Dynamics Control in a Social Network

14:30-15:30　Parallel Session IV

Tencent Web Site: https://meeting.tencent.com/s/HUqDmLNuQh6L　　**ID of meetings: 434 767 719**

Host: Fanyong Meng, Central South University, China

Theme: Applied Game Theory

Date	Beijing Time	Speaker(Institution)	Titles
April 24, Saturday, Afternoon	14:30-15:00	Hanjoon Michael Jung (Tianjin University, China)	Discretionary Red Tape
	15:00-15:30	Yuyu Chen (Changshu Institute of Technology, China)	Quantity and Collection Decisions of the Remanufacturing Enterprise under Both the Take-back and Carbon Emission Capacity Regulations

15:30-17:30　Parallel Session V

T Tencent Web Site: https://meeting.tencent.com/s/HUqDmLNuQh6L　　**ID of meetings: 434 767 719**

Host: Fanyong Meng, Central South University, China

Theme: Behavioral/Experimental Game Theory

Date	Beijing Time	Speaker(Institution)	Titles
April 24, Saturday, Afternoon	15:30-16:00	Xin Fang (Waseda University, Japan)	The Stock Price Prediction Experiments under Different Levels of the Asymmetric of the Information
	16:00-16:30	Huimin Liu (Guangxi University, China)	The Effects of Different Fairness Reference Points on Collaborative Innovation of Supply Chain
	16:30-17:00	Jian Cao (Beijing University of Posts and Telecommunications, China)	Pricing and Bidding in M/M/1 Queuing System with Reservation Price and Loss Aversion
	17:00-17:30	Zhe Yang (Shanghai University of Finance and Economics, China)	Models on Cooperative Equilibria with Infinitely Many Players

April 25, the detailed arrangements about Keynote Speeches are as follows.

April 25, 09:00-12:00   Keynote Speech 5~7

Tencent Web Site: https://meeting.tencent.com/s/Q15Ypo40sLPm   **ID of meetings：325 440 615**

Date	Beijing Time	Host(Institution)	Speaker(Institution)	Titles
April 25, Sunday, Morning	09:00-10:00	Zhigang Cao (Beijing Jiaotong University, China)	Pinyan Lu (Shanghai University of Finance and Economics, China)	Optimal Auction Design: Simplicity and Robustness
	10:00-11:00	Hui Yang (Guizhou University, China)	Ning Sun (Nanjing Audit University, China)	Job Matching with Subsidy and Taxation
	11:00-12:00	Wensheng Jia (Guizhou University, China)	Junjie Zhou (National University of Singapore, Singapore)	Multi-activity Influence and Intervention

April 25, the detailed arrangements about Parallel Sessions are as follows.

14:00-17:00   Parallel Session I

Tencent Web Site: https://meeting.tencent.com/s/PuL35tX8qS7q   **ID of meetings：257 343 865**

Host: Zhigang Cao, Beijing Jiaotong University, China

Theme: Market/Mechanism Design 2

Date	Beijing Time	Speaker(Institution)	Titles
April 25, Sunday, Afternoon	14:00-14:30	Yongchao Zhang (Shanghai University of Finance and Economics, China)	The Core of School Choice Problems
	14:30-15:00	Xiang Sun (Wuhan University, China)	On the Core of Markets with Co-ownerships and Indivisibilities
	15:00-15:30	Yifen Mu (Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China)	Optimal Incentive Design in Inverse Stackelberg Games
	15:30-16:00	Yunlong Wang (AMSS, Chinese Academy of Sciences, China)	Does Soft-close Eliminate Advantages of Sniping in Online Auctions?
	16:00-16:30	Yan Long (Huazhong University of Science and Technology, China)	Unpaired Exchange under Dichotomous Preferences
	16:30-17:00	Yizhi Wang (Tianjin University, China)	Distributive Politics with Other-Regarding Preferences

14:00-16:30　Parallel Session II

Tencent Web Site: https://meeting.tencent.com/s/ylVnTQXO9SlA　　**ID of meetings**：820 405 366

Host: Xiaohui Yu, Beijing Wuzi University, China

Theme: Cooperative Game 2

Date	Beijing Time	Speaker(Institution)	Titles
April 25, Sunday, Afternoon	14:00-14:30	Xia Zhang (Northwestern Polytechnical University, China)	The Prekernel of Cooperative Games with α-excess
	14:30-15:00	Yifan Feng (Northwestern Polytechnical University, China)	Sharing a River with Line-tree Structure: Minimal Responsibility Downstream Compensation Method
	15:00-15:30	Xianghui Li (Henan University of Technology, China)	An Allowable Value for Cooperative Games with Restricted Permutations
	15:30-16:00	Erfang Shan (Shanghai University, China)	Cooperative Games with Partial Information
	16:00-16:30	Jiangjing Zhou (Qingdao University, China)	Transferable Utility Cooperative Differential Games with Continuous Updating Using Pontryagin Maximum Principle

14:00-16:30　Parallel Session III

Tencent Web Site: https://meeting.tencent.com/s/a7F7hLdcoREO　　**ID of meetings**：426 426 371

Host: Wensheng Jia, Guizhou University, China

Theme: Noncooperative Game

Date	Beijing Time	Speaker(Institution)	Titles
April 25, Sunday, Afternoon	14:00-14:30	Shan Pei (Beijing Normal University, China)	Games on Network with Two Types of Players
	14:30-15:00	Zhonghao Shui (Kyoto University, Japan)	Degree-K Subgame Perfect Nash Equilibria and the Folk Theorem
	15:00-15:30	Haitao Li (Shandong Normal University, China)	Matrix Approach to Verification of Finite Multi-Potential Games
	15:30-16:00	Wensheng Jia (Guizhou University, China)	Approximation Theorems on Equilibrium Problems and Some Applications
	16:00-16:30	Tao Wang (Nanjing Audit University, China)	Stochastic Dominance and Learning in Binomial Models

13:00-16:30 Parallel Session IV

Tencent Web Site: https://meeting.tencent.com/s/P02fs43zKJB4   **ID of meetings：322 221 382**

Host: Panfeng Sun, Northwestern Polytechnical University, China

Theme: Supplementary Session

Date	Beijing Time	Speaker(Institution)	Titles
April 25, Sunday, Afternoon	13:00-13:30	Jiaosu Wu (von Neumann Institute for Mathematics and Intelligence Science, DHWL Co.)	Game Theory and AI Research Methodology
	13:30-14:00	Li Yin (Huawei Russian Research Institute / Saint Petersburg State University, Russia)	Dynamic Shapley Value for 2-Stage Cost Sharing Game
	14:00-14:30	Yang Yang (School of management, University of Science and Technology of China)	Ordering and interest rate strategies in platform finance with an overconfident and capital-constrained retailer
	14:30-15:00	Hua Gong (Shenyang Ligong University, China)	Scheduling parallel machines problem with batch deliveries subject to machine breakdown with non-cooperative game theory
	15:00-15:30	Jinming Du (Northeastern University, China)	How to bridge the gap between opinion dynamics and evolutionary game
	15:30-16:00	Tongkui Yu (Southwest University, China)	An Evolutionary Model of For-profit Enforcement and Pervasive Law-violation
	16:00-16:30	Tengfei Guo (Tianjin University, China)	Frenemies' Optimal Pricing in Two-sided Market with Consumer Multi-homing and Service Provider Independence

13:00-17:00　Parallel Session V

Tencent Web Site: https://meeting.tencent.com/s/AOJ13Az9v3YA　　**ID of meetings：284 667 135**

Host: Guanghui Yang, Guizhou University, China

Theme: Chinese Session

Date	Beijing Time	Speaker(Institution)	Titles
April 25, Sunday, Afternoon	13:00-13:30	Guanghui Yang (Guizhou University, China)	Characterizations of Pareto-Nash Equilibria for Multiobjective Potential Population Games
	13:30-14:00	Chun Wang (Guizhou University, China)	Bargaining Equilibria of Multi-objective Games
	14:00-14:30	Yifei Sun, (University of International Business and Economics, China)	Direct Nash Implementation with Evidence
	14:30-15:00	Suohai Fan （Jinan University, China）	Evolutionary Accumulated Temptation Game on Small World Networks
	15:00-15:30	Zhibin Tan (Beijing Jiaotong University, China)	Equal-core Minimum Cost Spanning Tree Games
	15:30-16:00	Yu Zhou (Kyoto University, Japan)	A Market Design of China's Housing Market with High Price: Efficiency and Fairness
	16:00-16:30	George Yuan (Sun Yat-Sen University, China)	The Mechanism of SME Growth under the Game Behavior with Strategic and Nonstrategic Partners
	16:30-17:00	Fanjun Yao (Qingdao University, China)	Low-carbon Supply Chain Coordination: a Dynamic Perspective

9. Abstracts /摘要

1. Several Solutions for TU Games Based on Proportionality

Yukihiko Funaki, Waseda University, Japan

We introduce a family of proportional surplus division values for TU-games.

Firstly, we introduce a value which allocates the total payoff proportional to player's stand-alone worth over all the players. We call this Proportional Division value (PD-value) and give some characterizations including a reduced game consistency.

Secondly, we introduce a value which allocates the payoffs proportional to the separable contributions of the players. We call this Proportional Allocation of Non-Separable Contributions value (PANSC value). This value is characterized by the efficiency and the weak balanced externalities, which requires that every player's payoff is the same fraction of its total externality inflicted on the other players. We also provide characterizations of the PANSC value using a reduced game consistency axiom.

Lastly, we introduce a family of values. Each value first assigns to each player a compromise between his stand-alone worth and the average stand-alone worth over all players, and then allocates the remaining worth among the players in proportion to their stand-alone worths. This family contains the proportional division value and the new egalitarian proportional surplus division value as two special cases. We provide characterizations for this family of values, as well as for each single value in this family.

2. Consolidating Marginalism and Egalitarianism: A new Value Based on Coalition Size

Surajit Borkotokey, Rajnish Kumar, Dhrubajit Choudhury, Sudipta Sarangi, Dibrugarh University, India

In cooperative games with transferable utilities, the Shapley value is an extreme case of marginalism while the Equal Division rule is an extreme case of egalitarianism. The Shapley value does not assign anything to the non-productive players and the Equal Division rule does not concern itself to the relative efficiency of the players in generating a resource. However, in real life situations neither of them is a good fit for the fair distribution of resources as the society is neither devoid of solidarity nor it can be indifferent to rewarding the relatively more productive players. Thus, a trade-off between these two extreme cases has caught attention from many researchers. In this paper, we obtain a new value for cooperative games with transferable utilities that adopts egalitarianism in smaller coalitions on one hand and on the other hand takes care of the players' marginal productivity in sufficiently large coalitions. Our value is identical with the Shapley value on one extreme and the Equal Division rule on the other extreme. We provide four characterizations of the value using variants of standard axioms in the literature. We also provide a mechanism that implements our value in sub-game perfect Nash equilibrium.

3. The Shapley Value in Positional Queueing Problems

ChangYong Han, Youngsub Chun, Seoul National University, Korea

A group of agents are waiting to be served in a facility. The facility can serve only one agent at a time and agents differ in their cost types. We are interested in finding the order in which to serve agents and the corresponding monetary transfers for the agents. In the standard queueing problem, each agent's waiting cost is assumed to be constant per unit of time. In this paper, we allow the cost of each agent to depend on the cost type of each agent and the position assigned to be served. Furthermore, this function is assumed to

be supermodular with respect to the cost type and the position, and non-decreasing with respect to each argument. Our "positional queueing problem" can be regarded as a generalization of the queueing problem with multiple parallel servers as well as the position allocation problem (Essen and Wooders 2018). By applying the Shapley value to the problem, we obtain generalized versions of the minimal transfer rule (Maniquet 2003) and of the maximal transfer rule (Chun 2006). We discuss additional properties of these two rules.

4. Valuation Monotonicity, Fairness and Stability in Assignment Problems
Rene van den Brink, Marina Nunez, Francisco Robles, VU, Netherlands

In two-sided assignment markets with transferable utility, we first introduce two weak monotonicity properties that are compatible with stability. We show that for a fixed population, the sellers-optimal (respectively the buyers-optimal) stable rules are the only stable rules that satisfy object-valuation antimonotonicity (respectively buyer-valuation monotonicity). Essential in these properties is that, after a change in valuations, monotonicity is required only for buyers that stay matched with the same seller. Using Owen's derived consistency, the two optimal rules are characterized among all allocation rules for two-sided assignment markets with a variable population, without explicitly requiring stability. Whereas these two monotonicity properties suggest an asymmetric treatment of the two sides of the market, valuation fairness axioms require a more balanced effect on the payoffs of buyers and sellers when the valuation of buyers for the objects owned by the sellers change.

For assignment markets with a variable population, we introduce grand valuation fairness requiring that, if all valuations decrease in the same amount, as long as all optimal matchings still remain optimal, this leads to equal changes in the pay of all agents. We show that the fair division rules are the only rules that satisfy this grand valuation fairness and a weak derived consistency property.

5. Optimal Auction Design: Simplicity and Robustness
Pinyan Lu, Shanghai University of Finance and Economics, China

Mechanism design is a central topic of microeconomics. We focus on revenue maximizing auctions in this talk. We will first introduce the celebrated Myerson's optimal auction and discuss the assumptions made by Myerson. We motivate the mechanism design problem of relaxing the assumptions and discuss some of the exciting work regarding the simplicity and robustness of auctions.

6. Job Matching with Subsidy and Taxation
Ning Sun, Nanjing Audit University, China

Governments often provide employers with financial incentives which depend on the sets of people they hire. This paper studies such fiscal policies (subsidy and taxation) in a Kelso- Crawford job matching framework, and characterizes which transfer functions preserve the substitutes condition (for all revenue functions that satisfies the condition), a condition crucial for guaranteeing the existence and other regularities of competitive equilibria. We find that a transfer function preserves the substitute condition if and only if it can be written as a sum of an additively separable transfer function and a cardinally concave transfer function. Then we characterize transfer functions that preserve the substitutes condition for revenue functions which are, respectively, group separable, group concave, cardinally concave, etc. The vectorial substitutes condition, a generalization of the substitutes condition, is also studied.

7.   Multi-activity Influence and Intervention

Junjie Zhou, National University of Singapore, Singapore

Using a general network model with multiple activities, we analyses a planner's welfare maximising interventions taking into account within-activity network spillovers and cross-activity interdependence. We show that the direction of the optimal intervention, under sufficiently large budgets, critically depends on the spectral properties of two matrices: the first matrix depicts the social connections among agents, while the second one quantifies the strategic interdependence among different activities. We also discuss several applications and extensions.

8.   Hepatorenal Organ Exchange

Moyuru Watanabe, Tokyo Institute of Technology, Japan

As a starting point for the study of organ exchange, I construct a model of organ exchange in which the kidney and liver are treated simultaneously. By handling different organs in the same pool, the number of transplants is expected to increase. In this study, I construct a model that handles kidneys and livers simultaneously, and propose a mechanism that satisfies Pareto efficiency, strategy proofness, and individual rationality. In addition, this study shows that not only a net increase in the number of transplants, but also a transplant opportunity can be given to pairs that have been disadvantaged in the conventional kidney exchange.

This study also shows the ethical problems of a mechanism that treats both kidneys and livers simultaneously with a view to social implementation of the algorithm, and the theoretical analysis of them.

9.   Menu Mechanisms

Yu Zhou, Kyoto University, Japan

We investigate menu mechanisms: dynamic mechanisms where at each history, an agent selects from a menu of his possible assignments. In comparison to direct mechanisms, menu mechanisms o↵er better privacy to participants; we formalize this with a novel notion of mechanism informativeness. We consider both ex-post implementation and full implementation, for both subgame perfection and a strengthening of dominance that covers o↵-path histories, and provide conditions under which menu mechanisms provide these implementations of rules. Our results cover a variety of environments, including elections, marriage, college admissions, auctions, labor markets, matching with contracts, and object allocation

10.   Cores in Discrete Exchange Economies with Complex Endowments

Jun Zhang, Nanjing Audit University, China

In discrete exchange economies without transfers, the core is a traditional and useful solution. But when endowments are complex, as defined by Balbuzanov and Kotowski (2019 Econometrica), the core can be empty. Our contribution is twofold. First, we find the root of the problem with the core under complex endowments and propose a rectification. Second, we propose a refinement of the exclusion core proposed by BK. A common theme in our two contributions is how to properly restrict the altruistic participation of indifferent players in blocking coalitions. The two solutions we propose are independent, and they have a nonempty intersection. We generalize the You Request My House - I Get Your Turn mechanism to find their intersection, which imply that the two solutions are nonempty.

11. Strategy-Proof Allocations with Punishment

Lining Han, Ruben Juarez, Wuhan University, China

A mechanism chooses an allocation of the resource to agents based on their reported type. We discover and describe the set of incentive compatible mechanisms when a monetary punishment to agents who misreport type is possible. This class of mechanisms depends on the punishment function. It expands previous characterizations of incentive compatible mechanisms when punishment was no available. Furthermore, we characterize the optimal mechanism for any punishment function. If the planner has the ability to select the punishment function, the minimal punishment to achieve incentive compatibility and first-best efficiency is discussed.

12. A Signature Sequential Allocation Mechanism for International Environmental Agreement

Haolan Yu, University of Illinois at Chicago, USA

To deal with the global pollution, International Environmental Agreement (IEA) is a useful measure to reach global cooperation. In the previous literature, researchers just concern the stable of the IEAs but neglect how to promote countries to form an IEA. This paper proposes an allocation mechanism based on the signature sequence. In our allocation mechanism, just if a country sign IEA, the other country could sign it one by one and the global coalition is reached spontaneously. The countries which sign IEA later will get a little more benefit, hence our allocation mechanism could provide more motivation to encourage the developing country join in the IEA. Furthermore, we extend the symmetrical local and global spillover effects of (Michael Günther,2017) to asymmetry situation and give a feasible allocation mechanism in the more complex situation.

13. Stable Coalition Structures and Power Indices for Majority Voting

Takaaki Abe, Waseda University, Japan

An (n, k)-game is a voting game in which each player has exactly one vote, and decisions are made by at least k affirmative votes of the n players. A power index is a measure of the a priori power of the n voters. The purpose of this paper is to show what axioms of power indices generate stable coalition structures for each (n, k)-game. Using the stability notion of the core, we show that a coalition structure containing a minimal winning coalition is stable for a wide range of general power indices satisfying a set of axioms, such as the Shapley-Shubik, Banzhaf, normalized Banzhaf, and Deegan-Packel power indices. Moreover, we also show that a coalition structure that represents a two-party system can be stable if the two large parties are close enough in size. Some unstable coalition structures are also analyzed.

14. Power indices for Networks, with Applications to Matching Markets

Qianqian Kong, Hans Peters, Northwestern Polytechnical University, China

We study situations where agents can form or sever links in a network: what agents can do exactly is described by effectivity functions. A power index assigns to such an effectivity function a number for each agent, measuring the possibilities of that agent. We characterize a class of power indices by four axioms: the Transfer Property, the Dummy Property, Symmetry, and Network Neutrality. As a corollary, we obtain power indices for the case where effectivity functions are induced by preferences of the agents about each other and about severing a link. Applications are one-to-one, one-to-many, and many-to-many matching markets, as well as roommate problems.

15. Quasi-Owen Value for Games on Augmenting Systems with a Coalition Structure

Jie Tang, Zijun Li, Fanyong Meng, Central South University, China

In some cooperative situations, not all coalitions are feasible. In addition, players usually join in unions for obtaining more payoffs. Considering these situations, this paper focuses on games on augmenting systems with a coalition structure that can be seen as an extension of games with a coalition structure and games on augmenting systems. Considering the player payoffs, the quasi-Owen value is defined. To show the rationality of this payoff index, five representative axiomatic systems are established. Furthermore, the population monotonic allocation scheme (PMAS) and the core of games on augmenting systems with a coalition structure are introduced. Moreover, the relationships between the PMAS and the quasi-Owen value as well as the core and the quasi-Owen value are discussed. Finally, an illustrative example is given to show the concrete application of the new payoff indices in supply chain.

16. A coalitional Bargaining Game with Majority Rule

Guangjing Yang, Marc Uetz, Hoeksma Ruben, Northwestern Polytechnical University, China

This paper proposes a noncooperative legislative bargaining model in which each legislator has a certain number of votes and the approve of a proposal requires only a fraction of the approval committees' votes. We first provide the characterization of the set of stationary subgame perfect equilibria (SSPE). Then with the help of this characterization, we show the existence of SSPEs. Moreover, when we restrict our attention to the grand-coalition efficient games, we show that the pivotal players extract all the gains from the grand coalition when they are patient enough.

17. Evolutionary Public Goods Game on the Bi-random Geometric Graph

Yang Li, Hao Sun, Weibin Han, Wanda Xiong, Northwestern Polytechnical University, China

To investigate the evolution of cooperation in spatial public goods games, this paper establishes a bi-random geometric graph, in which two types of nodes, representing players and public goods respectively, are placed at random locations in the unit square. Each public good has a limit influence range and the individuals that fall into the same range engage in a public good game. In contrast to the classical network models consisting of only one type of nodes, the bi-random geometric graph provides a natural way to describe the scenarios where individuals and public resources are independent of each other. Numerical simulations reveal that cooperation can be significantly promoted when the group size and the average number of groups that each player participates in are relatively small, which is at odds with the results on the square lattice, but is consistent with a body of empirical evidence reported by Ostrom (the winner of the 2009 Nobel Prize in Economics) and Olson et al. Analysis of the evolutionary process suggests that the facilitation of cooperation is due primarily to the formation of the cooperative clusters which can effectively resist the invasion of the defectors.

18. A Simple Model of the Power Elite

Sihua Ding, Marcin Dziubiński, Sanjeev Goyal, Nankai University, China

A number of empirical studies argue that, in modern democratic societies, decision making power is concentrated in a very small group of individuals. The sociologist, C. Wright Mills, referred to this group as the `Power Elite'. Opinion is divided on the impact of such concentration. On the one hand, there is the

view that such cohesion facilitates the spread of information, best practices and of cooperative behavior. On the other hand, others have argued that such personal connections sustain favoritism and perpetuate inequality. What are the determinants of exclusive structures and the emergence of dominant groups? Are such structures socially desirable? We propose a model of club membership to explore these questions. The model has two types of active agents: individuals seeking to join clubs and club owners. We study efficient and stable club memberships. Our main result is that a stable club membership structure always has the power elite feature, but such a structure is not necessarily efficient.

19. Screening with Network Externalities
Fanqi Shi, Yiqing Xing, Peking University, China

Network externality is a prominent feature of increasingly many products: the marginal payoff of one's consumption increases as his neighbors consume more. Information of network structure is important to the seller, but is often privately known to the buyers. We model a monopoly's optimal pricing strategy to "screen" buyers' network information: their susceptibility (out-degree) and influence (in-degree). Our main result is that susceptibility and influence have different effects on the optimal allocations and can be separated out in the optimal screening contracts: the seller directly screens buyers on their susceptibility and indirectly condition the allocations on their inferred influence. We also extend the model to accommodate for (1) the case in which the monopoly can incentivize influence with contingent contracts (referral bonuses) and (2) the situation in which susceptibility and influence are endogenous to the optimal allocations.

20. Designing Weighted and Directed Networks under Complementarities
Xueheng Li, Nanjing Audit University, China

A planner designs a weighted and directed network to achieve her objectives. The network determines the complementarities between agents and hence their effort. The planner's objective function can be convex to capture efficiency objectives or strictly concave to capture egalitarian concerns. Optimal networks are generalized nested split graphs (GNSGs) that exhibit a 'link-dominance' ordering among agents and are hierarchical such that some agent is more influential and exerts strictly higher effort than others. This occurs even when agents are homogenous and the planner has egalitarian concerns. Additionally, all equilibrium networks in a decentralized network formation model are inefficient GNSGs.

21. Myopic Formation of Networks
Yang Sun, Wei Zhao, Junjie Zhou, Sichuan University, China

We study the problem of designing network sequentially and myopically when agents play a complementary network game. In each period, the planner connects two unlinked agents in the network formed by previous stages to achieve the highest equilibrium welfare. We show that the network formation process is unique in the sense that the formed network is quasi-complete in each period regardless the strength of complementary effect. This result refines the prediction of (globally) efficient network in the literature by showing that, fixing the number of total links, quasi-complete graph dominates the other nested split graph. Finally, we show that when the strength of network effect is small and the total number of links is large, both myopically and globally efficient network is quasi-complete.

22. Consistency and Converse Consistency in Network Games

Loyimee Gogoi, Genjiu Xu, Doudou Gong, Northwestern Polytechnical University, China

The main purpose of the paper is to analyze the potential function and consistency property for allocation rules in network games. In network games, the potential function is a successful tool to find allocation rules. Consistency means that an allocation rule is invariant when we consider any sub-network of the network. The initial point of this paper is to define node-potential and link-potential for player-based and link-based allocation rules in network games. We introduce the notion of bilater node-consistency and link-consistency. The meaning of bilateral node-consistency (bilateral link-consistency) is the same as consistency only difference is that a solution is unchanged when considered by sub-networks of one link with two players only. We extend this idea to sub-networks with k players (l links) and call it k-lateral node-consistency (l-lateral link-consistency). Moreover, we characterize the Myerson value and position value using these properties. It is shown that the converse consistency plays a crucial role in the characterizations of these values.

23. Opinion Dynamics Control in a Social Network

Chen Wang, Vladimir Mazalov, Hongwei Gao, Qingdao University, China

This paper considers a game-theoretic model of external control influence on opinion dynamics and reached consensus in a social network. The network participants are linked through an arbitrary communication graph. The goal of control is to keep the opinions of all network participants in the neighborhood of a given value. If there are several players, these target values may differ. The dynamic game under consideration belongs to the class of linear-quadratic games in discrete time. In the symmetric case, the solution is constructed analytically. It is shown that in the model with one player, a controlled consensus is achieved in the social network. The multiple players model shows that although there is no consensus in the social network, the equilibrium is completely determined by the mean value of the opinion of all participants, which converges to a certain value.

24. Discretionary Red Tape

Hanjoon Michael Jung, Chul-In Lee (SNU), Jaimie Lien (CUHK), Jie Zheng (Tsinghua U.)

A corrupt bureaucrat may abuse the government's legal authority by imposing red tape to extract personal bribes. We analyze the consequences of such discretionary red tape in a market with licensing for suppliers, and compared them with standard corruption models. Red tape leads to a chain reaction of increased bribery and outlawry, reduced qualification levels, and under-consumption of the service in question. Rather than solving the efficiency problem of red tape, corruption causes and rises further from red tape. The ultimate consequence is a surplus-burning transfer away from the market in question, into the pocket of the corrupt bureaucrat.

25. Quantity and Collection Decisions of the Remanufacturing Enterprise under Both the Take-back and Carbon Emission Capacity Regulations

Yuyu Chen, Changshu Institute of Technology, China

This study considers a monopolist remanufacturing enterprise under both mandatory carbon emission capacity and take-back regulations. We explore the optimal decisions of the remanufacturer and investigate the impacts of regulations on both the economy and environment. Using stylized models, we

study four scenarios (i.e., with and without take-back and carbon emission capacity regulations). We first analyze how should the remanufacturer adjust operational decisions to maximize profit. We then explore both the economic and environmental implications of regulations. Our analysis reveals: (1) Carbon regulation is not only an effective way to reduce carbon emissions but can also stimulate remanufacturing. (2) For the enterprise, both take-back and carbon emission capacity regulations lead to lower profit, and we provide guidance for the enterprise to make production and pricing adjustments. (3) For the government, carbon cap is an effective measure to reduce the environmental impact; however, when setting the remanufacturing target, it is critical to evaluate the environmental impact during disposal phase.

26. The Stock Price Prediction Experiments under Different Levels of the Asymmetric of the Information

Xin Fang, Yukihiko Funaki, Waseda University, Japan

We conduct several stock price prediction experiments to study subjects' prediction behaviors under different levels of the asymmetric of the information. The experiment design follows Ilomaki(2012). In the experiments, subjects have two types, informed type and uninformed type. Informed type receives the fundamental value of the stock as the private information. Uninformed type receives no information. Subjects are asked to predict the next period's stock price and reward from an accurate prediction.

We find that when the information is symmetric or asymmetric at a low level, stock price strongly related with the fundamental value. As the level of the asymmetric of the information increase, stock price drifts away from the fundamental value. We also compare the data between laboratory experiments and online experiments.

27. The Effects of Different Fairness Reference Points on Collaborative Innovation of Supply Chain

Huimin Liu, Hui Hao, Chunping Zhang, Yaping Qu, Guangxi University, China

Fairness has an important influence on collaborative innovation among enterprises in the supply chain. Decision-makers with fairness concern determine decisions by selecting different fairness reference points. In other words, different fairness reference points result in different decisions and different influences on innovation. Therefore, this article studies the collaborative innovation problem in a supply chain comprising a fairness-neutral supplier and a fairness-concerned retailer who chooses supplier's profit, Nash bargaining solution and firm contribution as three kinds of fairness reference points. In specific, we focus on analyzing the influence of each kind of fairness reference point on supply chain's decision-making on collaborative innovation, and the distinction among innovation decisions under different fairness reference points. The main findings are as follows: (1) compared with the fairness-neutral retailer, a fairness-concerned retailer induces a decrease of the innovation level of a supply chain regardless of which fairness reference point the retailer chooses, and the innovation level declines with the increase of the retailer's fairness concern intensity, bargaining power as well as firm contribution. (2) When making a comparison among the three cases of fairness reference points, the supply chain innovation level is higher in the case of supplier's profit as the reference point than in the cases of Nash bargaining solution as the reference point and firm contribution as the reference point if retailer's bargaining power and firm contribution are both large. On the contrary, the supply chain innovation level is higher in the case of Nash bargaining solution as the reference point and firm contribution as the reference point than in the case of supplier's profit as the reference point. (3) The selection of firm

contribution as the reference point leads to a higher supply chain innovation level relative to choosing Nash bargaining solution as the reference point if the retailer's bargaining power is equal to the firm contribution, which implies that the reference point of Nash bargaining solution has a greater influence on supply chain decision-making on the collaborative innovation.

28. Pricing and Bidding in M/M/1 Queuing System with Reservation Price and Loss Aversion

Jian Cao, Yongjiang Guo, Beijing University of Posts and Telecommunications, China

In this paper, we consider two different settings in M/M/1 queueing system with reservation price and loss aversion. Reservation price is adopted to measure individuals' behavioral intention. Loss aversion aims to characterize individuals' reference-dependent preferences. We mainly discuss two problems: pricing and bidding. We begin by considering a pricing problem where a service provider provides services for loss-averse customers with reservation price. We characterize that the customer's equilibrium behavior depends on her reservation price, personal equilibrium (PE) reservation price and the service provider's interval of price. Moreover, the profit-maximizing service provider sets the price by considering available customers' preferred personal equilibrium (PPE) reservation price. We then obtain some insights into how customers' loss aversion degree affects the service provider's optimal price. For example, customers with higher loss averse degree about the waiting time and the payment would push the service provider to decrease the optimal price. Customers with higher loss aversion degree about the service reward would urge the service provider to increase the optimal price. Furthermore, the lowest possible expected profit of the service provider is obtained for considering the attachment effect. Secondly, a bidding price problem is proposed, where a loss-averse service provider with reservation price provides services for surplus-maximizing customers. The service provider's reservation price and behavior in equilibrium are investigated. Additionally, the customer's optimal bidding price is considered. We find that loss aversion regarding the holding cost drives the optimal bidding price up, whereas loss aversion regarding the fee drives it down.

29. Models on Cooperative Equilibria with Infinitely Many Players

Zhe Yang, Shanghai University of Finance and Economics, China

We first recall the notions of cooperative equilibria in the game theory and exchange economies. Furthermore, we provide some recent work on the models of cooperative equilibria with infinitely many players.

30. The Core of School Choice Problems

Kang Rong, Qianfeng Tang, Yongchao Zhang, Shanghai University of Finance and Economics, China

We propose a notion of core for school choice problems. We say that a coalition of students is sable to enforce a subassignment among them if, given their priorities at schools, other students together cannot exclude any of them from her assignment. An assignment is in the core if no coalition of students can enforce any subassignment among them that Pareto improves their assignments. We show that the core is always nonempty and all assignments in it are Pareto efficient. When the student-proposing deferred acceptance mechanism is a Pareto efficient mechanism, it always produces the unique assignment in the core.

31. On the Core of Markets with Co-ownerships and Indivisibilities

Xiang Sun, Wuhan University, China; Qianfeng Tang, Shanghai University of Finance and Economics, China; Mingjun Xiao, Wuhan University, China

Following Balbuzanov and Kotowski (2019), we study the exchange of indivisible objects among agents with unit demand, where initially each object is either privately owned or is co-owned by multiple agents. We propose a new notion of core called the effective core for these problems to address the inadequacies of conventional notions of core. We say that a coalition effectively blocks an assignment if it weakly blocks it– as in the definition of the strong core–and the blocking is credible in the sense that no agent in the coalition takes any redundant object owned by a self-feasible subcoalition. We show that the effective core is a nonempty subset of the weak core and a superset of the strong core, and all assignments in it are Pareto efficient. We also propose an algorithm to find assignments in it. Lastly, we make a detailed comparison between the effective core and Balbuzanov and Kotowski's exclusion core.

32. Optimal Incentive Design in Inverse Stackelberg Games
Yifen Mu, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China

One fundamental problem in inverse Stackelberg games is the optimal utility the leader can get and the corresponding optimal incentive strategy for the leader. We will give the sufficient and necessary condition for incentive controllability of the game, which turns out to be not essential. We will propose the clear procedures of designing the optimal incentive strategies for the leader, which will form an incentive channel no matter the game is IC or not IC. This gives a complete solution to this problem in static case.

33. Does Soft-close Eliminate Advantages of Sniping in Online Auctions?
Zhigang Cao, Yunlong Wang, Xiaoguang Yang, Lin Zhao, AMSS, Chinese Academy of Sciences, China

The phenomenon of sniping (bidding as late as possible) is prevalent in online auctions and harms the efficiency of trade. A common solution that is practiced by many online auction platforms is changing the ending rule from hard-close to soft-close. But does soft-close ending rule indeed eliminate the strategic advantages of sniping? Previous empirical findings on different auction platforms are mixed. We study this problem by investigating a limited-attention model and demonstrate that the answer is "Both-Yes-and-No". By "Yes" we mean that the winning probability and the expected profit by using the sniping strategy are both lower in soft-close auctions than in hard-close ones, and the expected revenue of the seller is higher. By "No" we mean that sniping in soft-close auctions is still the uniquely optimal strategy, and furthermore, the ratio of increased winning probability and the ratio of increased expected profit from using a non-sniping strategy to using the sniping strategy are both higher in soft-close auctions than in hard-close ones. These theoretical results reconcile the conflicting findings in previous literature. We also provide additional empirical evidences from a large-scale data of Alibaba Judicial Auction.

34. Unpaired Exchange under Dichotomous Preferences
Yan Long, Huazhong University of Science and Technology, China

We consider exchange problems with dichotomous preferences, and we assume that agents with compatible (incompatible) endowments participate are willing to exchange their endowments with other compatible (incompatible) objects. We look for exchanges rules that are pareto efficient, individually

rational and strategy-proof. We first observe that the priority rules appeared in the literature before are not fully strategy-proof, that is, agents will report preferences towards objects owned by other agents sincerely, but may misreport preferences towards their own endowments. We construct a new class of rules called "endowment-respecting priority rules" that satisfy the three properties. The key is to give priorities to agents with compatible endowments while requiring them to stick to their own endowments whenever it is compatible with efficiency.

35. Distributive Politics with Other-Regarding Preferences

Minh Tung Le, University of Warwick; Alejandro Saporiti, University of Manchester; Yizhi Wang, Tianjin University, China

This paper analyzes a non-smooth model of probabilistic voting with two parties and a broad family of other-regarding behavior, including fairness and quasi-maximin preferences, income-dependent altruism, and inequity aversion. The paper provides conditions for equilibrium existence and uniqueness. It also characterizes the Nash equilibrium in pure strategies when parties hold either symmetric payoffs, or minor forms of asymmetries. The characterization shows that the two parties converge to an equilibrium policy that maximizes a mixture of a ``self-regarding utilitarian'' social welfare function and an aggregate of society's other-regarding preferences. These results are shown to be applicable to other non-smooth frameworks, such as probabilistic voting with loss-averse voters. The characterization also shows that the direction and the size of the inefficiencies emerging from electoral competition depend in a subtle way on the nature of the other-regarding preferences (and resp., loss aversion).

36. The Prekernel of Cooperative Games with α-excess

Xia Zhang, René van den Brink, Arantza Estévez-Fernández, Northwestern Polytechnical University, China

In this paper, we introduce a new approach to measure the dissatisfaction for coalitions of players in cooperative transferable utility games. This is done by considering affine (and convex) combinations of the classical excess and the proportional excess. Based on this so-called α-excess, we define new solution concepts for cooperative games, such as the α-prenucleolus and the α-prekernel. The classical prenucleolus and prekernel are a special case. We characterize the α-prekernel by strong stability and the α-balanced surplus property. Also, we show that the payoff vector generated by the α-prenucleolus belongs to the α-prekernel.

37. Sharing a River with Line-tree Structure: Minimal Responsibility Downstream Compensation Method

Yifan Feng, Dongshuang Hou, Panfei Sun, Hao Sun, Northwestern Polytechnical University, China

With the development of economy, pollutants will appear in rivers, causing a certain cleaning cost. In order to deal with the cost sharing problem of cleaning polluted rivers, we propose one new allocation called Minimal responsibility downstream compensation method (m_i-DCM, for short), based on two main advocated doctrines in international disputes: the theory of Absolute Territorial Sovereignty (ATS) and Unlimited Territorial Integrity (UTI). On one hand, we study the dynamic implementation process of the downstream compensation method. On the other hand, we axiomatic the new cost allocation rule via several axioms. Moreover, the fairness of the method is explained by showing the coincidence of $m_i - DCM$ with the Shapley value of the corresponding responsibility game. Finally, we illustrate the stability of our

model by showing that the $m_i - DCM$ solution, is a core allocation.

38. An Allowable Value for Cooperative Games with Restricted Permutations

Xianghui Li, Henan University of Technology, China

Suppose any pairwise players can switch their positions as long as it is beneficial for them, this paper studies cooperative games that not all of the permutations on players actually occur. Based on the idea that in every formed ordered coalition, the entry of each player should get the permission of all of its predecessors, we first introduce the concept of connected ordered coalitions in a game. Then we define a game with generalized characteristic function, called ordered restricted game, induced by the original game. Second, we propose an allowable value in the similar spirit as the Shapley value and give its axiomatizations. Finally, several extensions of this value are presented.

39. Cooperative Games with Partial Information

Erfang Shan, Shanghai University, China

Let (N, v) be a cooperative game with transferable utility and F ⊆ 2N an arbitrary set system, where F represents the set of feasible coalitions S whose worths v(S) are known. We introduce a game (N, vF) as follows. If S∈F, then vF(S)=v(S) and otherwise vF(S) is defined such that S has zero Harsanyi dividend. By taking different F, this model produces some well-known games directly or indirectly, such as hypergraph games. We characterize the Shapley value of (N, vF) on different domains similarly to that for the Myerson value.

40. Transferable Utility Cooperative Differential Games with Continuous Updating Using Pontryagin Maximum Principle

Jiangjing Zhou, Anna Tur, Ovanes Petrosian, Hongwei Gao, Qingdao University, China,

We consider a class of cooperative differential games with continuous updating making use of the Pontryagin maximum principle. It is assumed that at each moment, players have or use information about the game structure defined in a closed time interval of a fixed duration. Over time, information about the game structure will be updated. The subject of the current paper is to construct players' cooperative strategies, their cooperative trajectory, the characteristic function, and the cooperative solution for this class of differential games with continuous updating, particularly by using Pontryagin's maximum principle as the optimality conditions. In order to demonstrate this method's novelty, we propose to compare cooperative strategies, trajectories, characteristic functions, and corresponding Shapley values for a classic (initial) differential game and a differential game with continuous updating. Our approach provides a means of more profound modeling of conflict controlled processes. In a particular example, we demonstrate that players' behavior is braver at the beginning of the game with continuous updating because they lack the information for the whole game, and they are "intrinsically time-inconsistent". In contrast, in the initial model, the players are more cautious, which implies they dare not emit too much pollution at first.

41. Games on Network with Two Types of Players

Shan Pei, Ross Cressman, Boyu Zhang, Beijing Normal University, China

Here we describe a dynamic game framework to study how social networks influences individual

behaviors and collective actions. We consider a network coordination game with two types of players, where different types of players prefer different strategies without the influence of neighbors and all players prefer to take the strategy that is most common among their neighbors. We assume that players update their strategies through stochastic best response. Both theoretical analysis and numerical simulations are used to study the effect of network structure on the evolutionary outcome of the dynamic game. Our main finding is that a lower homophily index in general promotes coordination, whereby the two types of players will choose the same strategy at the stable equilibrium. In contrast, when the homophily indices are higher, the players tend to choose their preferred strategies. Numerical simulations on random networks and free-scale networks confirm that this result is reliable. We then apply this result to characterize the influence of social networks on the strategy and the outcome of election.

42. **Degree-K Subgame Perfect Nash Equilibria and the Folk Theorem**
    Zhonghao Shui, Kyoto University, Japan

    In infinitely repeated n-player games, we introduce a notion of degree-K subgame perfect Nash equilibria (degree-K SPNE), in which any set of players whose size is up to K can coalitionally deviate and can transfer their payoffs within the coalition. If we only assume that players' actions are observable, players cannot detect a coalitional deviation with hidden deviators who play as in the equilibrium. Hence we consider two models where the hidden deviators can and cannot be detected, respectively. In the first model, there is an observer who can detect any coalitional deviation and report it to all players. We show an extension of the standard folk theorem; all feasible payoff vectors in which the sum of payoffs within any feasible coalition is strictly larger than the counterpart of the minmax value defined for the coalition arise as a degree-K SPNE if players are sufficiently patient. In the second model, we characterize degree-SPNE payoff vectors under patience by strategies which punish all players after any deviation. Finally, we adopt a new approach to characterize degree- SPNE payoff vectors in the first model, since the punishment in the above folk theorem does not work when the grand coalition is feasible.

43. **Matrix Approach to Verification of Finite Multi-Potential Games**
    Haitao Li, Aixin Liu, Shandong Normal University, China

    This paper studies the verification of multi-potential games with a given partition, and proposes a kind of multi-potential equation based on semi-tensor product of matrices. Firstly, the basis of each player's potential function is constructed, based on which, a new formula is established for the calculation of each player's potential function. Secondly, a new potential equation is proposed for the verification of potential games via each player's potential function. Using the new potential equation, a kind of multi-potential equation is constructed for the verification of multi-potential games with a given partition. It is proved that a finite game is a multi-potential game with a given partition if and only if the multi-potential equation has solution. In addition, all possible potential functions are obtained for each group of the partition. An illustrative example is worked out to show the effectiveness of the obtained new results.

44. **Approximation Theorems on Equilibrium Problems and Some Applications**
    Wensheng Jia, Guizhou University, China

    An approximation theorem is proved for vector equilibrium problems under some general assumptions. As a special case, we obtain some corollaries for scalar equilibrium problems. These results

not only provide some theoretical foundations for algorithms of solving the vector equilibrium problems but also reflect that the full rationality can be approached by the bounded rationality. Moreover, we obtain a generic convergence theorem of the solutions of strictly-quasi-monotone vector equilibrium problems according to Baire's theorems. As applications, we investigate vector variational inequality problems, vector optimization problems and Nash equilibrium problems of multi-objective games as special cases.

45. Stochastic Dominance and Learning in Binomial Models

Tao Wang, Nanjing Audit University, China

We consider several well-known stochastic dominance relations of prior beliefs and their implications in binomial models with unknown state of nature (the probability of moving up). Each period, a random outcome, either up or down, is observed.

46. Game Theory and AI Research Methodology

Jiaosu Wu, Zhenzhen Li, von Neumann Institute for Mathematics and Intelligence Science, DHWL Co.

Game theory play a central role in artificial intelligence research. In this talk, we propose a novel AI research methodology from the perspective of game-theoretical learning and game-theoretical logic and initiate the topic of trustworthy AI. We find an interesting link between Reproducing Kernel Hilbert Space (RKHS) and John von Neumann's Self-Reproducing Automata Theory. We conclude with some open questions.

47. Dynamic Shapley Value for 2-Stage Cost Sharing Game

Li Yin, Huawei Russian Research Institute / Saint Petersburg State University, Russia

The problem of constructing the Dynamic Shapley values in a two stage game is studied. During the dynamic game, each stage game can be considered as a minimum cost spanning tree game. From the first stage, the players' strategy profiles construct the graph in stage games, and the minimum cost spanning tree of the graph is defined by Prim (1957). At the second stage, the graph built by the players will be changed in some possible ways, with several specified probabilities. These probabilities are determined by the strategy profiles of players in the first stage. The meaning of the change is to break several edges on the graph. Then the players' cooperative behavior is defined. Along the cooperative trajectory, characteristic functions are defined for all coalitions. The IDP(Imputation Distribution Procedure) was used to construct Dynamic Shapley Values.

48. Ordering and interest rate strategies in platform finance with an overconfident and capital-constrained retailer

Jie Liu, Yang Yang, Yugang Yu, School of management, University of Science and Technology of China

We investigate the effect of overconfidence on a capital-constrained supply chain under platform finance (PF), in which the retailer sells products and pursues a financing strategy through a platform. The retailer's overconfident behavior is gauged by a cognitive bias in the estimation of demand variance. We develop Stackelberg games under two PF schemes: fulfillment by platform (FBP) and by retailer (FBR). We find that overconfidence influences participants' decisions and performances. Slight overconfidence weakens the platform's bargaining power since the retailer will make conservative order decision and the

platform will cut the interest rate. Severe overconfidence may be exploited by the platform since the retailer performs insensitivity to the interest rate. We find there exists a Pareto region that entices both parties to participate FBP.

49. Scheduling parallel machines problem with batch deliveries subject to machine breakdown with non-cooperative game theory

Hua Gong, Lixin Tang Yu, Shenyang Ligong University, China

Motivated by the flow of products in the iron and steel industry, we address a coordinated scheduling problem on parallel machines with batch deliveries subject to machine breakdown. If machine breakdown occurs, rescheduling will be implemented to response to machine breakdown. The jobs finished on the parallel machines are delivered to the corresponding customers in batches. Robustness and stability are two important measures to evaluate the quality of rescheduling. Non-cooperative game theory is applied to solve the coordinated scheduling problem since two objectives cannot be optimized simultaneously.

We build a non-cooperative game model where the two objectives are viewed as two sides which take part in the game. Firstly, we provide a Q-learning algorithm to generate pre-scheduling without considering machine breakdown, and derive a dynamic programming to obtain batching decision in the delivery part. We also provide Nash Equilibrium searching algorithm to find Nash Equilibrium solutions or near Nash Equilibrium solutions. The computational results show that the game model and the algorithm proposed in this paper can obtain better effective performance.

50. An Evolutionary Model of For-profit Enforcement and Pervasive Law-violation

Tongkui Yu, Kaiyue Wang, Jin Xu, Southwest University, China

Pervasive law-violation, the committing of certain illegal behavior by most individuals, exists in many fields, such as the overloading of trucks, pollution-discharge of chemical companies, etc., in some societies especially developing economies. For-profit enforcement is considered to be one possible reason for this phenomenon. This paper reveals the causality using an evolutionary model. In this model, individuals are bounded rational, and decide on whether to abide a law by learning from each other in a short time horizon; the law enforcement agency, with higher rationality and the knowledge of individuals' behavior evolution, will choose proper inspection frequency and punishment strength to maximize its payoff in a long time horizon. It is found that the best choice for law enforcement agency is not to investigate diligently and punish strictly, but to adopt lower inspection frequency and punishment strength, because this induces more individuals to violate the law and brings a higher payoff for law enforcement agency. However, this intended lenient enforcement leads to a pervasive law-violation in the society. Possible solutions to this issue are discussed.

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52. Frenemies' Optimal Pricing in Two-sided Market with Consumer Multi-homing and Service Provider Independence

Tengfei Guo, Shiquan Zhong, Tianjin University, China

Two-sided platforms have become the center of daily life by providing consumers and independent service providers with convenient access to each other, which will result in users' incentive to multi-homing. In this paper, we aim to investigate platforms' optimal pricing strategies when they compete and cooperate with each other, with the presence of consumer multi-homing and service provider independence.

We develop a game-theoretical model for our analysis, using video platforms as an example, we find that (i) platform cooperation leads to more multi-homing consumers in the market, further, more active participants in a platform. (ii) When service providers are employees, platform cooperation leads to higher prices for consumers when the proportion of exclusive contents is low; when service providers are independent and fully covered, cooperation results in higher wages and more intense competition in service provider side. (iii) When service providers' opportunity cost is low and they are fully covered, service provider independence harms two-sided platforms' profits; when opportunity cost is high, and service providers are partially covered, platforms can benefit from service provider independence by keeping more contents exclusive. Our findings are helpful to explain platforms' competition and cooperation behavior widely observed in practice, and provide managerial guidance on the selection of business model and partners.

53. Characterizations of Pareto-Nash Equilibria for Multiobjective Potential Population Games

Guanghui Yang, hui Yang, Guizhou University, China

This paper studies the characterizations of (weakly) Pareto-Nash equilibria for multiobjective population games with a vector-valued potential function called multiobjective potential population games, where agents synchronously maximize multiobjective functions with fifinite strategies via a partial order on the criteria-function set.

On one hand, based on Kuhn-Tucker conditions of multiobjective optimization, a strongly (weakly) Kuhn-Tucker state is introduced for its vector-valued potential function and it is proven that each strongly (weakly) Kuhn-Tucker state is one (weakly) Pareto-Nash equilibrium. On the other hand, the converse is obtained for multiobjective potential population games with two strategies by utilizing Tucker's Theorem of the alternative and Motzkin's one of linear systems. Precisely, each (weakly) Pareto-Nash equilibrium is equivalent to a strongly (weakly) Kuhn-Tucker state for multiobjective potential population games with two strategies. These characterizations by a vector-valued approach are more comprehensive than an additive weighted method. These novel results provide a theoretical basis for further computing (weakly) Pareto-Nash equilibria of multiobjective potential population games and their practical applications.

54. Bargaining Equilibria of Multi-objective Games

Chun Wang, Guizhou University, China

To solve the choice of multi-objective game's equilibria, we construct general bargaining games called self-bargaining games, and define their individual welfare functions with three appropriate axioms. According to the individual welfare functions, we transform the multi-objective game into a single-objective game and define its bargaining equilibrium, which is a Nash equilibrium of the single-objective game. And then, based on certain continuity and concavity of the multi-objective game's payoff function, we proof the bargaining equilibrium still exists and is also a weakly Pareto-Nash equilibrium. Moreover, we analyze several special bargaining equilibria, and compare them in a few examples.

55. Direct Nash Implementation with Evidence

Yichun Chen, Soumen Banerjee, Yifei Sun, University of International Business and Economics, China

We study full implementation with hard evidence in a bounded environment. By invoking off-the-equilibrium monetary transfers, we show that a social choice function is implementable in mixed-strategy Nash equilibrium in a direct revelation mechanism if and only if it satisfies the measurability condition.

56. Evolutionary Accumulated Temptation Game on Small World Networks

Suohai Fan, Jinan University, China

The temptation in the traditional prisoner's dilemma is constant. To explore the evolution of temptations, the accumulated temptation game is proposed, where the temporal temptation is of heterogeneity among agents according to historical strategies. Agents accumulate the temptations by cooperation but consume the temptation by defection. The accumulation factor is introduced to measure the amplitude of the variation of temptations. During the evolutionary process, the density of cooperators and the average temptation may move towards the same direction. Cooperative behaviors will be eliminated if the accumulation factor is large enough. As an interesting result, a fraction of agents may keep cooperation constantly for accumulating temptations and they instantaneously defect at a certain time. The higher accumulation factor accelerates the instantaneous defection of agents. The completely random networks play an essential role in motivating cooperation when the temptation is small.

57. Equal-core Minimum Cost Spanning Tree Games

Zhibin Tan, Zhigang Cao, Zhengxing Zou, Beijing Jiaotong University, China

We consider the problem of cost allocation among players of a minimum cost spanning tree network. It is formulated as a cooperative game in characteristic function, referred to as a minimum cost spanning tree (MCST) game (Claus and Kleitman, 1973). We introduce the so-called equal-core minimum cost spanning tree game deduced from any MCST game. For such game, if the cost of any link decreases, then the core of this new game will change.

58. A Market Design of China's Housing Market with High Price: Efficiency and Fairness

Lijun Pan, Nanjing University, China; Ning Sun, Nanjing Audit University, China; Dazhong Wang, Nanjing University, China; Yu Zhou, Kyoto University, Japan

The housing market in China is characterized by a dual structure with the coexistence of commercial housing and affordable housing markets. Nevertheless, these two housing markets are lacking in coordination and interaction. Therefore, investigating the linkage between these two markets is crucial for the development of the housing market in China. Building on market design theories, this paper establishes a model that characterizes China's housing market and proposes a new equilibrium concept. We find desirable properties of the new equilibrium concept and identify the optimal housing market equilibrium that maximizes the welfare of residents. Among all equilibria, the optimal housing market equilibrium has the lowest price while maintaining both the efficiency of the commercial housing market and the fairness of the affordable housing market. Furthermore, we design an allocation mechanism, which could be realized in practice through a transaction platform. If there exists an optimal equilibrium, our mechanism could capture and achieve the optimal equilibrium. If there exists no optimal equilibrium, our mechanism suggests reaching an optimal mechanism by controlling the supply of affordable houses. This paper provides a generalized theoretical framework of the market design for China's housing market, and our results provide the theoretical foundation for the governmental reform.

59. The Mechanism of SME Growth under the Game Behavior with Strategic and Nonstrategic Partners
George Yuan, Sun Yat-Sen University, China

Based on the stochastic resonance of stochastic dynamic systems as a tool, the goal of this paper is to establish a generalized dynamical framework for small and micro enterprises (SMEs) growth in the tech-economic paradigm. As applications, this framework not only allows us to describe the change of economic structure by mathematical modeling for Schumpeter's economic development theory due to the innovation established since early 20th century, but also helps us to find the optimal motive forces for the change of economic structure itself with the new concept VaRR (Value at Response Risk) of SME growth performance.

On the other hand, from the perspective of game theory, the growth of SMEs can be regarded as the mechanism of the interplay between periodic effect from operating capital and stochastic fluctuation associated with internal and external environment, which can effectively drive SMEs to regularly switches between capital and technology equilibria, and produce the maximum of stochastic incentive effect under the coupled stochastic dynamic systems in terms of cooperative or non-cooperative games (or in general term, "consensus games") for SMEs' growth influenced by strategic and nonstrategic partners, and measure the SME performance in terms of growth ability and cooperation efficiency.

Moreover, the optimal structures affecting the growth of SMEs (enterprises) is the best driving force (reason) for the change of the enterprise economic structure itself based on the development of technological innovation through the occurring of the stochastic resonance phenomenon due to internal and external deterministic or stochastic forces to support enterprises to reach their best status in terms of optimal equity, capital, and ownership structures.

60. Low-carbon Supply Chain Coordination: a Dynamic Perspective
Fanjun Yao, Hongwei Gao, Hui Jiang, Yunxu Zhou, Qingdao University, China

This paper documents the first attempt to apply the differential game theory for investigating some properties of a low-carbon supply chain coordination by employing the cost-sharing mechanism. The

manufacturer is the brand owner and the corresponding low-carbon goodwill is increased with respect to the reference emission reduction effect and consumption promotion. Three dynamic games are well-studied by considering the multiple effects of price and non-price factors on the market. It can be observed that the manufacturer always prefers to employ the coordination mechanism. When the manufacturer opts for a cost-sharing program, the manufacturer and retailer under Model-D are always economically better off, and therefore a cost-sharing program is always profit-Pareto-improving.

10. Tencent Meeting Software Installation Instructions /腾讯会议软件安装说明

User Guide for VooV

2020

In this manual, we will explain how to download, register, and log in the meeting system of the conference. Second, we will introduce a way to join a pre-booked meeting room via a code number. Finally, we'll show some basic functions of the meeting system, such as sharing the desktop for presentations, turning on and off video or audio, checking for the messages of others and setting virtual background.

Download, register and log in

The link https://www.voovmeeting.com/df/en/download-center.html?from=1001 (Voov Meeting Download) will guide you to the official download page. And you can just pick the version you need (as Fig. 1) and download it on your computer.
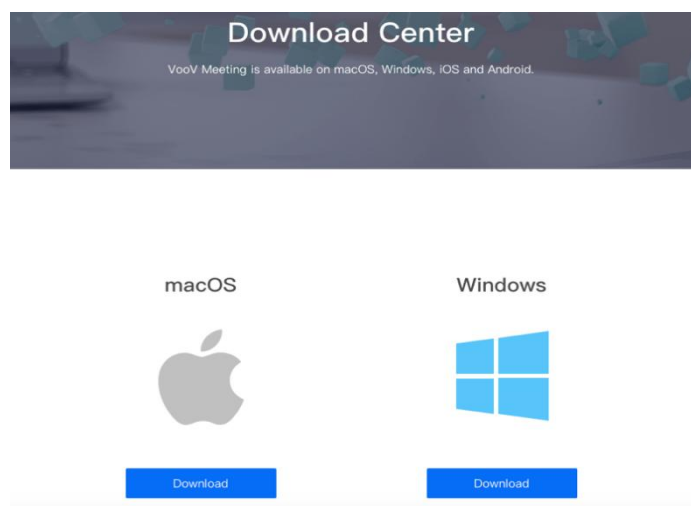

Fig. 1: Official Download Page

MacOS version will be used to demonstrate how to register and log in. Other versions have similar interfaces and operations.

After installing it, open first, and you will see a login window as Fig. 2. Please click "Sign Up/Log In" to register a new account or log in with your own. You will see a log in window as Fig.3.

You may click the small line of words saying "Sign Up" circled in red in Fig.3 to sign up for your own account. (When you have your account, you can just select the correct country code, enter your account number and password to successfully log in.) The click will lead you to a new website as Fig.4.