BIOGRAPHICAL SKETCH AND PROFESSIONAL ACTIVITIES
RENSSELAER POLYTECHNIC INSTITUTE

May 27, 2018

I. Personal Data

Name:	Lirong Xia
Current Rank:	Assistant Professor
Department:	Computer Science
School:	School of Science

Year and rank of first academic appointment at Rensselaer (e.g. instructor, assistant, associate, or full professor). Give dates and rank for subsequent promotions.

2013 - present Assistant Professor

Date of Birth: July 1982

Educational Preparation

(1) Baccalaureate and graduate degree(s), institution, date

Ph.D.	(Computer Science)	Duke University, Durham, NC	2011
M.Sc.	(Economics)	Duke University, Durham, NC	2010
B.S.	(Computer Science and Technology)	Tsinghua University, Beijing, China	2004

(2) Non-degree preparation

Exchange student,	Stanford University, Palo Alto, CA	2007
Non-matriculated graduate student,	Tsinghua University, Beijing, China	2004–2007

II. Professional Experience

(Give postdoctoral, teaching, industrial, governmental, and private practice experience prior to joining Rensselaer, giving position, employer, and dates.)

Postdoctoral Researcher	Harvard University, Cambridge, MA	Sep 2011-June 2013
Intern	Yahoo! Research, New York City, NY	Summer 2010

III. **Teaching**

A. **Courses**
(List the number and title of each course taught and approximate number of students in each course; Include undergraduate project supervision and courses that you have supervised with the number of instructors and students involved.)

Term	Course	Title	Enrollment
2013 Fall	CSCI 6976/4979	Computational Social Choice	9
2014 Spring	CSCI 4150	Introduction to Artificial Intelligence	32
2014 Fall	CSCI 6976/4979	Computational Social Choice	11
2016 Spring	CSCI 6976/4979	Computational Social Choice	13
2016 Spring	CSCI 2300	Introduction to Algorithms	189
2016 Fall	CSCI 4110/6110	Computational Social Processes	32
2017 Spring	CSCI 4150	Introduction to Artificial Intelligence	122
2017 Fall	CSCI 2300	Introduction to Algorithms	182
2018 Spring	CSCI 4150	Introduction to Artificial Intelligence	131

Undergraduate Research Projects:

- Peter Piech, *RANK AGGREGATION ALGORITHMS*, Spring 2015. Peter continued as a co-terminal master student under my supervision.
- Kevin Hwang, *MCMC RANK AGGREGATION*, Spring 2015. A paper on this project was published at UAI-15. Kevin continued as a co-terminal master student under my supervision.
- Zachary Jablons, *LABEL RANKING METHODS*, Spring 2014.
- Ethan Gertler, *READINGS IN CSCI*, Fall 2014. A paper on this project was published at AAMAS-15.
- William Schneider, *COMPUTATIONAL ECONOMICS*, Spring 2014. William graduated in summer 2014.

B. **Student Thesis Supervision** (List student's name, title of thesis, and year completed.)

a. **Bachelors**
None

b. **Masters**

Graduated

1. **Kevin Hwang**, CS, co-terminal master. Summer 2016.
2. **Peter Piech**, CS, co-terminal master. Spring 2016. Thesis: Generalized Method of Moments Algorithms For Learning Mixtures of Plackett-Luce Models.
3. **Jason Ko**, CS, co-terminal master. Summer 2017.
4. **Binghui Deng**, MSE Ph.D., CS master. Fall 2017.

In Progress

1. **Tristan Villamil**, CS, co-terminal master. Graduation expected 2018.

2. **Tyler Shepherd**, CS, co-terminal master. Graduation expected 2019.
3. **Bobby Martino**, CS, co-terminal master. Graduation expected 2019.

c. **Doctoral**

Ph.D. Students Advised:

Graduated

None

In Progress

1. **Sujoy Sikdar**, co-advised with Prof. Sibel Adali, CS, entered Ph.D. program Fall 2012. Defense expected 2018 summer. Title: "Optimal Multi-Attribute Decision Making in Human and Social Choice".
2. **Zhibing Zhao**, CS, entered Ph.D. program summer 2015. Graduation expected 2020.
3. **Jun Wang**, CS, entered Ph.D. program Fall 2016. Graduation expected 2021.
4. **Ao Liu**, CS, entered Ph.D. program Spring 2018. Graduation expected 2022.

Ph.D. Thesis Committee Memberships:

1. **John Postl**, CS, defended in March 2016. Computer Science Department, Advisor: Elliot Anshelevich. Title: "Analysis of Inefficiencies in Systems with Many Independent Agents."
2. **Shreyas Sekar**, CS, defended in March 2017. Computer Science Department, Advisor: Elliot Anshelevich. Title: "Non-Discriminatory Algorithmic Pricing: Decentralized Resource Allocation in Large Marketplaces".
3. **Maksim Tsikhanovich**, CS, defended in March 2018. Computer Science Department, Advisor: Malik Magdon-Ismail. Title: "Unsupervised Learning: Evaluation of Topic Models, Distributed Algorithms, Privacy".
4. **Kshiteesh Hegde**, CS, defended in May 2018. Computer Science Department, Advisor: Malik Magdon-Ismail. Title: "Applications of Deep Network Signatures to Subgraph Classification, Quantification of Network Structure and Topolotically Heterogeneous Node Classification".

Masters Thesis Committee Memberships:

1. **Sujoy Sikdar**, Advisor: Sibel Adali.

Research Qualifier Committee Memberships:

1. **John Postl**, Advisor: Elliot Anshelevich.

IV. **Publications**

A. **Books, Monographs, Recordings, Large Scale Musical or Video Works, Commissions**
(Give title, co-authors, or collaborators, if any, publisher or commissioners, and date. State if a contributing author to an edited compilation.)

1. **Book chapter.** Jerome Lang and Lirong Xia. Chapter 9: Voting in Combinatorial Domains. In *Handbook of Computational Social Choice*, edited by Felix Brandt, Vincent Conitzer, Ulle Endriss, Jerome Lang, and Ariel Procaccia, 2015.

B. **Journal Articles**
(Give title, co-authors, if any, journal, volume, issue, date, paging. List spin-offs (i.e., publications essentially on same piece of work) from a major work under the major item. Provide copies for at least the past six years of all journal articles, abstracts, and book reviews if they are not already with the department file. This list should also contain articles accepted but not yet in print and those submitted and not yet reviewed.)

1. **In refereed journals and conferences (articles which are reviewed by peers in the field prior to publication).**

   (a) **Major articles**

Journal Publications (accepted)

1. Jerome Lang, Jerome Mengin, and Lirong Xia. Voting on Multi-Issue Domains with Conditionally Lexicographic Preferences. *Artificial Intelligence* (**AIJ**), 2018. Previously published at CP-12.

2. Tie Luo, Sajal K. Das, Hwee Pink Tan, and Lirong Xia. Incentive Mechanism Design for Crowdsourcing: An All-Pay Auction Approach. ACM Transactions on Intelligent Systems and Technology (**TIST**). Volume 7 Issue 3, Article No. 35, April 2016. Previously published at INFOCOM-14.

3. Jessica Davies, George Katsirelos, Nina Narodytska, Toby Walsh and Lirong Xia. Complexity of and Algorithms for the Manipulation of Borda, Nanson and Baldwin's Voting Rules. *Artificial Intelligence* (**AIJ**), 217:20-42, 2014. Previously published at AAAI-11.

4. Yongzhi Cao, Lirong Xia, and Mingsheng Ying. Probabilistic automata for computing with words. *Journal of Computer and System Sciences* (**JCSS**), 79(1): 152-172, 2013.

5. Yann Chevaleyre, Jérôme Lang, Nicolas Maudet, Jérôme Monnot, and Lirong Xia. New Candidates Welcome! Possible Winners with respect to the Addition of New Candidates. *Mathematical Social Sciences*, 64(1): 7488, 2012. Previously published at AAMAS-11.

6. Lirong Xia and Vincent Conitzer. Determining Possible and Necessary Winners under Common Voting Rules Given Partial Orders. *Journal of Artificial Intelligence Research* (**JAIR**), 41:25–67, 2011. Previously published at AAAI-08.

7. Jérôme Lang and Lirong Xia. Sequential composition of voting rules in multi-issue

domains. *Mathematical Social Sciences* 57(3): 304-324, 2009. Previously published at TARK-07.

8. Jing Xiao, Lan Liu, Lirong Xia, and Tao Jiang. Efficient Algorithms for Reconstructing Zero-Recombinant Haplotypes on a Pedigree Based on Fast Elimination of Redundant Linear Equations. *SIAM Journal on Computing* (**SICOMP**), 38(6): 2198-2219, 2009. Previously published at SODA-07.

9. Lirong Xia and Sanjiang Li. On minimal models of the Region Connection Calculus. In *Fundamenta Informaticae* 69(4): 427–446, 2005.

Refereed Conference Proceedings (accepted)

1. Zhibing Zhao, Haoming Li, Junming Wang, Jeffrey Kephart, Nicholas Mattei, Hui Su, and Lirong Xia. A Cost-Effective Framework for Preference Elicitation and Aggregation. In Proceedings of **UAI-18**. Acceptance rate 30.8%.

2. Zhibing Zhao and Lirong Xia. Composite Marginal Likelihood Methods for Random Utility Models. In Proceedings of **ICML-18**. Acceptance rate 25%.

3. Zhibing Zhao, Tristan Villamil, and Lirong Xia. Learning Mixtures of Random Utility Model. In Proceedings of **AAAI-18**. Acceptance rate 24.6%.

4. Lirong Xia. Improving Group Decision-Making by Artificial Intelligence. In Proceedings of **IJCAI-17**. Invited paper.

5. David Parkes, Paul Tylkin, and Lirong Xia. Thwarting Vote Buying through Decoy Ballots. In Proceedings of **IJCAI-17**. Acceptance rate 26%.

6. Shreyas Sekar, Sujoy Sikdar, and Lirong Xia. Condorcet Consistent Bundling with Social Choice. In Proceedings of the 16th International Conference on Autonomous Agents and Multiagent Systems (**AAMAS-17**). Acceptance rate 26.1%.

7. Sujoy Sikdar, Sibel Adali, and Lirong Xia. Mechanism Design for Multi-Type Housing Markets. In Proceedings of the 31st AAAI Conference on Artificial Intelligence **(AAAI-17)**. Acceptance rate 24.6%.

8. Stephen Gross, Elliot Anshelevich and Lirong Xia. Vote Until Two of You Agree: Mechanisms with Small Distortion and Sample Complexity. In Proceedings of the 31st AAAI Conference on Artificial Intelligence **(AAAI-17)**. Acceptance rate 24.6%.

9. Haris Aziz, Thomas Kalinowski, Toby Walsh, and Lirong Xia. Welfare of Sequential Allocation Mechanisms for Indivisible Goods. In *Proceedings of the 22nd European Conference on Artificial Intelligence* (**ECAI-16**). Acceptance rate 27%.

10. Lirong Xia. Bayesian Estimators as Voting Rules. In Proceedings of the 32nd Conference on Uncertainty in Artificial Intelligence **(UAI-16). Full oral presentation, rate** $\approx 9.5\%$.

11. Zhibing Zhao, Peter Piech, and Lirong Xia. Learning Mixtures of Plackett-Luce Models. In Proceedings of the 33rd International Conference on Machine Learning **(ICML-16)**. Acceptance rate 24.3%.

12. Erika Mackin and Lirong Xia. Allocating Indivisible Items in Categorized Domains. In Proceedings of the 25th International Joint Conference on Artificial Intelligence **(IJCAI-16)**. Acceptance rate 24%.

13. Lirong Xia. Quantitative Extensions of The Condorcet Jury Theorem With Strategic Agents. **AAAI-16**. Acceptance rate 25.8%.

14. David Hughes, Kevin Hwang, and Lirong Xia. Computing Optimal Bayesian Decisions for Rank Aggregation via MCMC Sampling. **UAI-15**. Acceptance rate 34%.

15. Lirong Xia. Generalized Decision Scoring Rules: Statistical, Computational, and Axiomatic Properties. **ACM EC-15**.

16. Haris Aziz, Toby Walsh, and Lirong Xia. Possible and Necessary Allocations via Sequential Mechanisms. **IJCAI-15**. Acceptance rate 28.7%.

17. Ethan Gertle, Erika Mackin, Malik Magdon-Ismail, Lirong Xia, and Yuan Yi. Computing Manipulations of Ranking Systems. **AAMAS-15**. Acceptance rate 27%.

18. Haris Aziz, Simon Mackenzie, Lirong Xia, and Chun Ye. Structure and complexity of ex post efficient random assignments. To be presented at **AAMAS-15** (short paper).

19. Hossein Azari Soufiani, David C. Parkes, and Lirong Xia. A Statistical Decision-Theoretic Framework for Social Choice. In *Proceedings of the Annual Conference on Neural Information Processing Systems* (**NIPS-14**). **Full oral presentation, rate 20/1678=1.2%**

20. Lili Dworkin, Michael Kearns, and Lirong Xia. Efficient Inference for Complex Queries on Complex Distributions. In *Proceedings of the Seventeenth International Conference on Artificial Intelligence and Statistics* (**AISTAT-14**), Reykjavik, Iceland.

21. Tie Luo, Hwee-Pink Tan, and Lirong Xia. Profit-Maximizing Incentive for Participatory Sensing. In *Proceedings of the 33rd Annual IEEE International Conference on Computer Communications* (**INFOCOM-14**), Toronto, Canada.

22. Lirong Xia. Fixed-Parameter Tractability of Integer Generalized Scoring Rules. In *Proceedings of the 13th International Conference on Autonomous Agents and Multiagent Systems* (**AAMAS-14**) (short paper).

23. Hossein Azari Soufiani, David C. Parkes, and Lirong Xia. Computing Parametric Ranking Models via Rank-Breaking. In *Proceedings of the 31st International Conference on Machine Learning* (**ICML-14**), Beijing, China.

24. Hossein Azari Soufiani, William Chen, David C. Parkes, and Lirong Xia. Generalized Method-of-Moments for Rank Aggregation. In *Proceedings of the Annual Conference on Neural Information Processing Systems* (**NIPS-13**), Lake Tahoe, Nevada, USA. Acceptance rate 25.4%.

25. Hossein Azari Soufiani, David C. Parkes, and Lirong Xia. Preference Elicitation For General Random Utility Models. In *Proceedings of the 29th Conference on Uncertainty in Artificial Intelligence* (**UAI-13**), Bellevue, Washington, USA.

26. Lirong Xia. Designing Social Choice Mechanisms Using Machine Learning. To be presented at the *12th International Conference on Autonomous Agents and Multiagent Systems* (**AAMAS-13**), Saint Paul, MN, USA. Challenges and Visions Track. Acceptance rate 23%.

27. Hossein Azari Soufiani, David C. Parkes, and Lirong Xia. Random Utility Theory for Social Choice. In *Proceedings of the Annual Conference on Neural Information Processing Systems* (**NIPS-12**), pp. 126–134, Lake Tahoe, Nevada, USA. Acceptance rate 25.5%.

28. Jérôme Lang, Jérôme Mengin, and Lirong Xia. Aggregating Conditionally Lexicographic Preferences on Multi-Issue Domains. In *Proceedings of the 18th International Conference on Principles and Practice of Constraint Programming* (**CP-12**), pp. 973–987, Quebec City, Canada.

29. Nina Narodytska, Toby Walsh, and Lirong Xia. Combining Voting Rules Together. In *Proceedings of the Twentieth European Conference on Artificial Intelligence* (**ECAI-12**), pp. 612–617, Montpellier, France.

30. Dorothea Baumeister, Magnus Roos, Joerg Rothe, Lena Schend, and Lirong Xia. The Possible Winner Problem with Uncertain Weight. In *Proceedings of the Twentieth European Conference on Artificial Intelligence* (**ECAI-12**), pp. 133–138, Montpellier, France.

31. David C. Parkes and Lirong Xia. A Complexity-of-Strategic-Behavior Comparison between Schulze's Rule and Ranked Pairs. In *Proceedings of the Twenty-Sixth AAAI Conference on Artificial Intelligence* (**AAAI-12**), pp. 1429–1435, Toronto, Canada. Acceptance rate 26%.

32. Bo Waggoner, Lirong Xia, and Vincent Conitzer. Evaluating Resistance to False-Name Manipulations in Elections. In *Proceedings of the Twenty-Sixth AAAI Conference on Artificial Intelligence* (**AAAI-12**), pp. 1485–1491, Toronto, Canada. Acceptance rate 26%.

33. Lirong Xia. Computing the Margin of Victory for Various Voting Rules. In *Proceedings of the 13th ACM Conference on Electronic Commerce* (**EC-12**), pp. 982–999,Valencia, Spain.

34. Vincent Conitzer, and Lirong Xia. Approximating Common Voting Rules by Sequential Voting in Multi-Issue Domains. In *Proceedings of the 13th International Conference on Principles of Knowledge Representation and Reasoning* (**KR-12**), pp. 179–187, Rome, Italy.

35. Toby Walsh and Lirong Xia. Lot-based Voting Rules. In *Proceedings of the 11th International Conference on Autonomous Agents and Multiagent Systems* (**AAMAS-12**), pp. 603–610, Valencia, Spain, 2012. Acceptance rate 20.4%.

36. David M. Pennock and Lirong Xia. Price-updating in Combinatorial Prediction Markets with Bayesian Networks. In *Proceedings of the 27th Conference on Uncertainty in Artificial Intelligence* (**UAI-11**), pp. 581–588, Barcelona, Catalonia, Spain, 2011.

37. Vincent Conitzer, Toby Walsh, and Lirong Xia. Dominating Manipulations in Voting with Partial Information. In *Proceedings of the Twenty-Fifth AAAI Confer-*

ence on Artificial Intelligence (**AAAI-11**), pp. 638–643, San Francisco, California, USA. Acceptance rate 24.8%.

38. Nina Narodytska, Toby Walsh, and Lirong Xia. Manipulation of Nanson's and Baldwin's rule. In *Proceedings of the Twenty-Fifth AAAI Conference on Artificial Intelligence* (**AAAI-11**), pp. 713–718, San Francisco, California, USA. Acceptance rate 24.8%.

39. Vincent Conitzer, Jérôme Lang, and Lirong Xia. Hypercubewise Preference Aggregation in Multi-issue Domains. In *Proceedings of the 22nd International Joint Conference on Artificial Intelligence* (**IJCAI-11**), pp. 158–163, Barcelona, Catalonia, Spain, 2011. Acceptance rate 30.2%.

40. Lirong Xia and David M. Pennock. An Efficient Monte-Carlo Algorithm for Pricing Combinatorial Prediction Markets for Tournaments. In *Proceedings of the 22nd International Joint Conference on Artificial Intelligence* (**IJCAI-11**), pp. 452–457, Barcelona, Catalonia, Spain, 2011. Acceptance rate 30.2%.

41. Lirong Xia and Vincent Conitzer. A Maximum Likelihood Approach towards Aggregating Partial Orders. In *Proceedings of the 22nd International Joint Conference on Artificial Intelligence* (**IJCAI-11**), pp. 446–451, Barcelona, Catalonia, Spain, 2011. Acceptance rate 30.2%.

42. Lirong Xia, Vincent Conitzer, and Jérôme Lang. Strategic Sequential Voting in Multi-issue Domains and Multiple-Election Paradoxes. In *Proceedings of the 12th ACM Conference on Electronic Commerce* (**EC-11**), pp. 179–188, San Jose, CA, USA, 2011.

43. Lirong Xia, Jérôme Lang and Jérôme Monnot. Possible Winners When New Alternatives Join: New Results Coming Up! In *Proceedings of the 10th International Conference on Autonomous Agents and Multiagent Systems* (**AAMAS-11**), pp. 829–836, Taipei, Taiwan, 2011. Acceptance rate 21.9%.

44. Lirong Xia and Vincent Conitzer. Strategy-proof Voting Rules over Multi-issue Domains with Restricted Preferences. In *Proceedings of the Sixth Workshop on Internet and Network Economics* (**WINE-10**), pp. 402–414, Stanford, CA, USA, 2010.

45. Lirong Xia. Computational Social Choice: Strategic and Combinatorial Aspects. In *Proceedings of the Twenty-Fourth AAAI Conference on Artificial Intelligence* (**AAAI-10**), pp. 2000–2001, Atlanta, GA, USA, 2010. Acceptance rate 26.9%.

46. Lirong Xia and Vincent Conitzer. Stackelberg Voting Games: Computational Aspects and Paradoxes. In *Proceedings of the Twenty-Fourth AAAI Conference on Artificial Intelligence* (**AAAI-10**), pp. 921–926, Atlanta, GA, USA, 2010. Acceptance rate 26.9%.

47. Lirong Xia and Vincent Conitzer. Compilation Complexity of Common Voting Rules. In *Proceedings of the Twenty-Fourth AAAI Conference on Artificial Intelligence* (**AAAI-10**), pp. 915–920, Atlanta, GA, USA, 2010. Acceptance rate 26.9%.

48. Lirong Xia, Vincent Conitzer, and Ariel Procaccia. A Scheduling Approach to

Coalitional Manipulation. In *Proceedings of the 11th ACM Conference on Electronic Commerce* (**EC-10**), pp. 275–284, Cambridge, MA, USA, 2010.

49. Lirong Xia, Vincent Conitzer, and Jérôme Lang. Aggregating Preferences in Multi-Issue Domains by Using Maximum Likelihood Estimators. In *Proceedings of the 9th International Conference on Autonomous Agents and Multiagent Systems* (**AAMAS-10**), pp. 399–408, Toronto, ON, Canada, 2010. Acceptance rate 23.8%.

50. Sayan Bhattacharya, Vincent Conitzer, Kamesh Munagala, and Lirong Xia. Incentive Compatible Budget Reporting in Multi-unit Auctions. In *Proceedings of ACM/SIAM Symposium on Discrete Algorithms* (**SODA-10**), pp. 554–572, Cambridge, MA, USA, 2010.

51. Lirong Xia and Vincent Conitzer. Finite Local Consistency Characterizes Generalized Scoring Rules. In *Proceedings of the Twenty-First International Joint Conference on Artificial Intelligence* (**IJCAI-09**), pp. 336–341, Pasadena, CA, USA, 2009. Acceptance rate 25.7%.

52. Lirong Xia, Michael Zuckerman, Ariel D. Procaccia, Vincent Conitzer, and Jeffrey S. Rosenschein. Complexity of unweighted coalitional manipulation under some common voting rules. In *Proceedings of the Twenty-First International Joint Conference on Artificial Intelligence* (**IJCAI-09**), pp. 348–353, Pasadena, CA, USA, 2009. Acceptance rate 25.7%.

53. Lirong Xia and Jérôme Lang. A Dichotomy Theorem on the Existence of Efficient or Neutral Sequential Voting Correspondences. In *Proceedings of the Twenty-First International Joint Conference on Artificial Intelligence* (**IJCAI-09**), pp. 342–347, Pasadena, CA, USA, 2009. Acceptance rate 25.7%.

54. Vincent Conitzer, Jérôme Lang, and Lirong Xia. How hard is it to control sequential elections via the agenda? In *Proceedings of the Twenty-First International Joint Conference on Artificial Intelligence* (**IJCAI-09**), pp. 103–108, Pasadena, CA, USA, 2009. Acceptance rate 25.7%.

55. Vincent Conitzer, Matthew Rognlie, and Lirong Xia. Preference Functions That Score Rankings and Maximum Likelihood Estimation. In *Proceedings of the Twenty-First International Joint Conference on Artificial Intelligence* (**IJCAI-09**), pp. 109–115, Pasadena, CA, USA, 2009. Acceptance rate 25.7%.

56. Lirong Xia and Vincent Conitzer. Generalized Scoring Rules and the Frequency of Coalitional Manipulability. In *Proceedings of the 9th ACM Conference on Electronic Commerce* (**EC-08**), pp. 109–118, Chicago, IL, USA, 2008.

57. Lirong Xia and Vincent Conitzer. A Sufficient Condition for Voting Rules to Be Frequently Manipulable. In *Proceedings of the 9th ACM Conference on Electronic Commerce* (**EC-08**), pp. 99–108, Chicago, IL, USA, 2008.

58. Lirong Xia, Vincent Conitzer, and Jérôme Lang. Voting on Multiattribute Domains with Cyclic Preferential Dependencies. In *Proceedings of the 23rd AAAI Conference on Artificial Intelligence* (**AAAI-08**), pp. 202–207, Chicago, IL, USA, 2008. Acceptance rate 24.2%.

59. Lirong Xia and Vincent Conitzer. Determining Possible and Necessary Winners under Common Voting Rules Given Partial Orders. To appear in *Proceedings of*

the 23rd AAAI Conference on Artificial Intelligence (**AAAI-08**), pp. 196–201, Chicago, IL, USA, 2008. Acceptance rate 24.2%.

60. Lirong Xia, Jérôme Lang, and Mingsheng Ying. Strongly decomposable voting rules on multiattribute domains. In *Proceedings of the 22nd AAAI Conference on Artificial Intelligence* (**AAAI-07**), pp. 776–781, Vancouver, BC, Canada, 2007. Acceptance rate 27%.

61. Lirong Xia, Jérôme Lang, and Mingsheng Ying. Sequential voting rules and multiple elections paradoxes. In *Proceedings of the 11th conference on Theoretical Aspects of Rationality and Knowledge* (**TARK-07**), pp. 279–288, Brussels, Belgium, 2007.

62. Jing Xiao, Lan Liu, Lirong Xia, and Tao Jiang. Fast Elimination of Redundant Linear Equations and Reconstruction of Recombination-Free Mendelian Inheritance on a Pedigree. In *Proceedings of the ACM/SIAM Symposium on Discrete Algorithms* (**SODA-07**), pp. 655–664, New Orleans, LA, USA, 2007.

63. Lei Wang, Xu Liu, Lirong Xia, Guangyou Xu, and Alfred M. Bruckstein. Image orientation detection with integrated human perception cues (or which way is up). In *IEEE International Conference on Image Processing* (**ICIP-03**), vol 2: 539–542, Barcelona, Spain, 2003.

(b) **Abstracts, letters of correspondence, book reviews, etc.**

1. Lirong Xia. Generalized Scoring Rules: A Framework That Reconciles Borda and Condorcet. *SIGecom Exchanges*, 2014.

2. Vincent Conitzer and Lirong Xia. Commentary to Craig Boutilier, Chapter 14: Computational Decision Support Regret-Based Models for Optimization and Preference Elicitation, in *Comparative Decision Making* edited by Thomas R. Zentall and Philip H. Crowley, Oxford University Press.

(c) **Patents.**

None

V. **Research Grants and Contracts**
(Give title of project, other senior investigators, starting and completion dates, amount of funding, sponsoring agency.)

A. **Proposals Approved and Funded**

- **(PIs: Jim Hendler, Oshani Seneviratne, and Lirong Xia)**, "Smart Contracts on Blockchain Platforms Augmented with Machine Learning and Semantics". RPI-IBM AIRC. $100,000. 2018–2019.
- **(PI Xia: 100%)**, "Algorithmic Mechanism Design for Multi-Type Resource Allocation", NSF-IIS, **$373,536**, 2017-2020.
- **(PI Xia: 100%)**, "Improving Group Decision-Making by Artificial Intelligence", ONR, **$433,926**, 2017–2020.

- **(PI Xia: 100%)**, "CAREER: A New Theory of Social Choice for More than Two Alternatives: Combining Economics, Statistics, and Computation", NSF-IIS, **$524,989**, 2015–2020.

B. **Proposals submitted and not funded with current status**

(a) **Proposals pending.**

- PI Lirong Xia, coPI Bulen Yener, "SaTC: CORE: Small: Theoretical Foundations of Antimalware Sandbox Games", NSF-SaTC, $402,902, 2018-2021.

(b) **Unfunded proposals.**

- PI Zhenming Liu (W&M), co-PI Lirong Xia, "AF: Small: Collaborative Research: Foundations of Nonparametric Preference Learning from Rank Data", NSF, my part $175,100, 2018-2021.
- "RI: Small: Allocating Indivisible Items in Categorized Domains", PI Xia (single-PI), NSF-IIS, $411,769, 3 years. Submitted Oct 2015.
- "CRII: RI: Allocating Indivisible Items in Categorized Domains", PI Xia (single-PI), NSF-IIS, $175,000, 2 years. Submitted September 2014. (I became unqualified before the panel meeting because my CAREER proposal was funded.)
- "RI: Small: Allocating Indivisible Items in Categorized Domains", PI Xia (single-PI), NSF-IIS, $419,900, 3 years. Submitted January 2014.
- "DOMINANCE: Dominating Operational Missions by Intelligent and Novel Autonomy and Networking in Contested Environments,", co-PI Xia (PI: Nitesh Chawla from University of Notre Dame), ARL DCIST, **my part $1,267,250**, 5 years. Submitted July 2017.

C. **Briefly Describe Your Current Research Interests**

I am broadly interested in economics and computation, using state-of-the-art computational methods to solve economics problems and adopting computational thinking to economic phenomena. In particular, I am interested in:

- Design and analysis of social choice mechanisms with desirable economic, statistical, and computational properties.
- Mechanisms for resource allocation, especially allocation of indivisible items without payment.
- Rank aggregation and learning to rank.
- Recommender systems.
- Crowdsourcing.

VI. **Editorship of Journals, Reviews of Manuscripts, Books, and Research Proposals** (Give organization of journals, significant items reviewed, dates.)

(a) **Journal Editorship**

- 2015- present, associate editor, Mathematical Social Sciences
- 2013- 2017, editorial board member, Journal of Artificial Intelligence Research
- 2017- present, editorial board member, Artificial Intelligence Journal

(b) **Research Proposal Reviews**

- NSF panelist in 2015–2018
- Reviewer for BSF (US-Israel Binational Science Foundation)
- Reviewer for NWO (the Netherlands Organisation for Scientific Research)
- Reviewer for NSERC (Canada)
- Reviewer for FNP (Poland)

(c) **Journal Paper Reviews**

- **Computer Science:** ACM Transactions on Algorithms; Annals of Mathematics and Artificial Intelligence; Algorithmica; Artificial Intelligence Journal; IEEE Transactions on Intelligent Systems; IEEE Transactions on Internet Technology; IEEE Transactions on Systems, Man, and Cybernetics; Journal of Artificial Intelligence Research; Journal of Autonomous Agents and Multi-Agent Systems; Journal of Computer and System Sciences; Journal of the ACM; Theory of Computing Systems; SIAM Journal on Computing.
- **Economics:** Games and Economic Behavior, Journal of Economic Theory, Mathematical Social Sciences, Public Choice, Social Choice and Welfare.
- **Others:** The Harvard Undergraduate Research Journal, Discrete Applied Mathematics.

(d) **Conference/Workshop Chair**

- Seventh International Workshop on Computational Social Choice (COMSOC 2018)
- Conference on Auctions, Market Mechanisms and Their Applications (AMMA 2015)
- Multidisciplinary Workshop on Advances in Preference Handling (MPREF 2015)
- Multidisciplinary Workshop on Advances in Preference Handling (MPREF 2014)
- Workshop on Cooperative Games in Multiagent Systems (CoopMAS 2012)

(e) **Program Committees**

- **2013, 2015, 2016** Senior program committee member, *International Joint Conference on Artificial Intelligence* (IJCAI)
- **2012–2018** Program committee member, *AAAI Conference on Artificial Intelligence* (AAAI)
- **2012–2018** Program committee member and treasurer, *ACM Conference on Electronic Commerce* (EC)
- **2013–2017** Program committee member, *International Conference on Artificial Intelligence and Statistics* (AISTATS)
- **2012–2016,2018** Program committee member, *International Joint Conference on Autonomous Agents and Multiagent Systems* (AAMAS)
- **2011** Program committee member, *International Joint Conference on Artificial Intelligence* (IJCAI)
- **2015–2017** Program committee member, *Conference on Uncertainty in Artificial Intelligence* (UAI)

(f) **Conference Paper Reviews**

- (**in addition to conferences I served as PC above**) International Computing and Combinatorics Conference(COCOON), European Symposium on Algorithms (ESA), IEEE Symposium on Foundations of Computer Science (FOCS), Innovations in Theoretical Computer Science (ITCS), Annual Conference on Neural Information Processing Systems (NIPS), International Symposium on Algorithmic Game Theory (SAGT), ACM-SIAM Symposium on Discrete Algorithms (SODA), International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM), Workshop on Internet and Network Economics (WINE).

VII. Service

A. Service to University

1. *University, school, and departmental committees and dates for each.*
   - CS Graduate Curriculum Committee (2014-2017)
   - CS UCC (2017-present)
   - CS Graduate admission committee (2018-present)
   - CS Web Site Planning Committee (2014-2015)
   - CS colloquium co-chair (2014-2017)
2. *Undergraduate student academic advising (number and year).*
   2014 - 44 students, 2015 - 44 students, 2016 - 44 students, 2017 - 39 students,
3. *Graduate student academic advising (number and year).*
   For details, see Section III-B.
   2014- 1 student 2015 - 4 students 2016 - 5 students
   2017 - 5 students

B. Professional Societies

(Give memberships, positions held, dates.)

- Member of research board for random sample elections, 2013-present
- Treasurer, 2014 ACM Conference on Electronic Commerce (EC), 2014
- Member, ACM SIGecom (Special Interest Group on Electronic Commerce), 2013-present

VIII. **Professional and Public Lectures**
(List invited and contributed papers and lectures, giving title, organization, and dates.)

(a) **Invited Talks**

1. **Morgan Stanley**, Machine learning seminar. Title: *Improving group decision-making by AI*, 2018.
2. **RIT**, CS seminar. Title: *Improving group decision-making by AI*, 2018.
3. **Algorithm Game Theory and Internet Economics Workshop**, Invited talk. Title: *Improving group decision-making by AI*, 2018.
4. **U. Albany**, Economics seminar. Title: *Multi-Type Resource Allocation*, 2017.
5. **Harvard**, Econ-CS seminar. Title: *Multi-Type Resource Allocation*, 2017.
6. **IJCAI-17**, Early Career Spotlight. Title: *Improving group decision-making by AI*, 2017.
7. **IJCAI-17**, invited tutorial. Title: *Learning and decision making from rank data*, 2017.
8. **UNSW**, CSE seminar. Title: *Multi-Type Resource Allocation*, 2017.
9. **Tsinghua University**, IIIS seminar. Title: *Learning and decision making from rank data*, 2017.
10. **Peking University**, CS seminar. Title: *Learning and decision making from rank data*, 2017.
11. **Shanghai University of Finance and Economics**, CS seminar. Title: *Multi-Type Resource Allocation*, 2017.
12. **Shanghai University of Finance and Economics**, Shanghai Theory Day. Title: *Learning and decision making from rank data*, 2017.
13. **U. C. Berkeley**, Berkeley, CA, Simons Institute. Title: *Learning Mixtures of Plackett-Luce Models*, 2017.
14. **University of Maryland**, CS seminar. Title: *Learning and decision making from rank data*, 2016.
15. **College of William& Mary**, CS colloquium. Title: *Learning and decision making from rank data*, 2016.
16. **ChinaMAS**, online lecture. Title: *A dream for better group decision-making*, 2016.
17. **U. C. Berkeley**, Berkeley, CA, Simons Institute. Title: *A dream for better group decision-making*, 2015.
18. **Facebook**, Menlo Park, CA. Title: *A dream for better group decision-making*, 2015.
19. **Virginia Tech**, Blacksburg, VA, CS Department. Title: *A dream for better group decision-making*, 2015.
20. **USC**, Los Angeles, CA. Title: *A dream for better group decision-making*, 2015.
21. **Stanford**, Stanford, CA, MS&E seminar. Title: *A dream for better group decision-making*, 2015.
22. **Virginia Tech**, Blacksburg, VA, Economics Department. Title: *Allocating indivisible items in categorized domains*, 2015.

23. **U. C. Berkeley**, Berkeley, CA. Title: *Allocating indivisible items in categorized domains*, 2015.

24. **Google**, San Francisco, CA. Title: *New Algorithms for Learning and Decision Making under Discrete Choice Models*, 2015.

25. **ADT-2015 invited tutorial**, Lexinton, KY. Title: *Truth-revealing social choice*, 2015.

26. **Union College**, Schenectady, NY, undergraduate mathematics seminar series, Title: *Allocating Indivisible Items in Categorized Domains,* 2014.

27. **The International Symposium on Artificial Intelligence and Mathematics**, Ft. Lauderdale, FL, Title: *Assigning indivisible and categorized items,* 2014.

28. **51st Annual Allerton Conference on Communication, Control, and Computing**, Urbana, IL, Title: *Computing Parametric Ranking Models via Rank-Breaking,* 2013.

29. **Microsoft Research Asia**, Beijing, China, Title: *Statistical Algorithms for Computing Parametric Ranking Models,* 2013.

30. **Chinese Academy of Science**, Beijing, China, Title: *Preference Aggregation in Rich Domains,* 2013.

31. **Tsinghua University**, Beijing, China, Title: *Preference Aggregation in Rich Domains,* 2013.

32. **Shanghai Jiaotong University**, Shanghai, China, Title: *Preference Aggregation in Rich Domains,* 2013.

33. **Wuhan University**, Wuhan, China, Title: *Preference Aggregation in Rich Domains,* 2013.

34. **National University of Singapore**, Singapore, Winter School on Algorithmic Game Theory, Minicourse: *Maximum likelihood estimation (MLE) approaches in social choice,* 2013.

35. **National University of Singapore**, Singapore, Workshop on Algorithmic Game Theory, Title: *Random utility models for social choice,* 2013.

36. **University of Maryland College Park**, College Park, MD, Theory Seminar, Title: *A Manipulability Dichotomy Theorem for Generalized Scoring Rules,* 2012.

37. **University of Massachusetts Amherst**, Amherst, MA, Machine Learning and Friends Lunch, Title: *Random Utility Models for Social Choice,* 2012.

38. **Stanford University,** Research on Algorithms for the Internet (RAIN) Seminar, Title: *Random Utility Models for Social Choice,* 2012.

39. **Yale University**, Discrete Mathematics and Theoretical Computer Science Seminar. New Haven, Connecticut, Title: *A Manipulability Dichotomy Theorem for Generalized Scoring Rules,* 2012.

40. **Princeton University**, Princeton University Theory Lunch. Princeton, New Jersey, Title: *A Manipulability Dichotomy Theorem for Generalized Scoring Rules,* 2012.

41. **Columbia University**, New York, NY, Columbia Theory Seminar, Title: *A Manipulability Dichotomy Theorem for Generalized Scoring Rules,* 2012.

42. **University of Massachusetts Boston**, Boston, MA, Title: *Ordinal Preference Representation and Aggregation,* 2012.
43. **EPFL**, Lausanne, Switzerland, Summer Research Institute, Title: *Ordinal Preference Representation and Aggregation,* 2012.
44. **University of Zurich**, Zurich, Switzerland, Title: *Ordinal Preference Representation and Aggregation,* 2012.
45. **Shanghai Jiaotong University**, Shanghai, China, Title: *Ordinal Preference Representation and Aggregation,* 2012.
46. **Brown University**, Brown University Theory Lunch, Providence, RI, Title: *Computational Social Choice: Theoretic and Combinatorial Aspects,* 2011.
47. **Harvard University**, CRCS Seminar, Cambridge, MA, Title: *Computational Social Choice: Theoretic and Combinatorial Aspects,* 2011.
48. **Workshop on judgment aggregation and voting**, Karlsruhe, Germany, Title: *Strategic Sequential Voting in Multi-Issue Domains and Multiple-Election Paradoxes,* 2011.
49. **INFORMS Annual Meeting**, Title: *Strategic Sequential Voting in Multi-Issue Domains and Multiple-Election Paradoxes,* 2010.
50. **University of New South Wales**, CS Seminar, Sydney, Australia, Title: *Strategic Sequential Voting in Multi-Issue Domains and Multiple-Election Paradoxes,* 2010.
51. **Dagstuhl Seminar on Computational Foundations of Social Choice,** Dagstuhl, Germany, Title: *Computing and evaluating the unique outcomes of strategic sequential voting games,* 2010.
52. **Microsoft Research Asia,** Beijing, China, Title: *Generalized Scoring Rules frequency of manipulability and axiomatic characterization,* 2010.
53. **Bertinoro Workshop on Frontiers in Mechanism Design**, Bertinoro, Italy, Title: *Computing and evaluating the unique outcomes of strategic sequential voting games,* 2010.
54. **IRIT, Universite Paul Sabatier**, Toulouse, France, Title: *Voting with partial orders,* 2007.
55. **Dagstuhl Seminar on Computational Issues in Social Choice**, Dagstuhl, Germany, Title: *Voting with partial orders,* 2007.

(b) **Contributed Talks**

1. International Joint Conference on Artificial Intelligence (IJCAI-17). Title: *Learning and Decision-Making from Rank Data*, 2017.
2. International Joint Conference on Artificial Intelligence (IJCAI-17). Title: *Improving Group Decision-Making by Artificial Intelligence*, 2017.
3. AAAI Conference on Artificial Intelligence (AAAI). Title: *Mechanism Design for Multi-Type Housing Markets*, 2017.
4. International Joint Conference on Artificial Intelligence (IJCAI-16). Title: *Allocating Indivisible Items in Categorized Domains*, 2016.

5. Conference on Uncertainty in Artificial Intelligence (UAI-16). Title: *Bayesian Estimators as Voting Rules*, 2016.
6. AAAI Conference on Artificial Intelligence (AAAI). Title: *Quantitative Extensions of The Condorcet Jury Theorem With Strategic Agents*, 2016.
7. ACM Conference on Electronic Commerce (EC). Title: *Generalized Decision Scoring Rules: Statistical, Computational, and Axiomatic Properties*, 2015.
8. Annual Conference on Neural Information Processing Systems (NIPS). Title: *A Statistical Decision-Theoretic Framework for Social Choice*, 2014.
9. International Workshop On Internet And Network Economics (WINE). Tutorial: *Computational Social Choice*, 2013.
10. International Joint Conference on Artificial Intelligence (IJCAI). Tutorial: *Computational Social Choice*, 2013.
11. International Conference on Autonomous Agents and Multiagent Systems (AAMAS). Title: *Designing Social Choice Mechanisms Using Machine Learning*, 2013.
12. International Conference on Principles and Practice of Constraint Programming (CP). Title: *Aggregating Conditionally Lexicographic Preferences on Multi-Issue Domains*, 2012.
13. National Conference on Artificial Intelligence (AAAI). Title: *A Complexity-of-Strategic-Behavior Comparison between Schulze's Rule and Ranked Pairs*, 2012.
14. ACM Conference on Electronic Commerce (EC). Title: *Computing the Margin of Victory for Various Voting Rules*, 2012.
15. ACM Conference on Electronic Commerce (EC). Tutorial: *Computational Social Choice*, 2012.
16. International Conference on Principles of Knowledge Representation and Reasoning (KR). Title: *Paradoxes of Multiple Elections: An Approximation Approach*, 2012.
17. International Conference on Autonomous Agents and Multiagent Systems (AAMAS). Title: *Lot-based Voting Rules*, 2012.
18. National Conference on Artificial Intelligence (AAAI). Title: *Dominating Manipulations in Voting with Partial Information*, 2011.
19. National Conference on Artificial Intelligence (AAAI). Title: *Manipulation of Nanson's and Baldwin's rule*, 2011.
20. International Joint Conference on Artificial Intelligence (IJCAI). Title: *An Efficient Monte-Carlo Algorithm for Pricing Combinatorial Prediction Markets for Tournaments*, 2011.
21. ACM Conference on Electronic Commerce (EC). Title: *Strategic Sequential Voting in Multi-Issue Domains and Multiple-Election Paradoxes*, 2011.
22. International Conference on Autonomous Agents and Multiagent Systems (AAMAS). Title: *Possible Winners When New Alternatives Join: New Results Coming Up!*, 2011.
23. International Workshop On Internet And Network Economics (WINE). Title: *Strategyproof Voting Rules over Multi-issue Domains with Restricted Preferences*, 2010.

24. National Conference on Artificial Intelligence (AAAI). Title: *Computational Social Choice: Strategic and Combinatorial Aspects*, 2010.
25. National Conference on Artificial Intelligence (AAAI). Title: *Stackelberg Voting Games: Computational Aspects and Paradoxes*, 2010.
26. National Conference on Artificial Intelligence (AAAI). Title: *Compilation Complexity of Common Voting Rules*, 2010.
27. ACM Conference on Electronic Commerce (EC). Title: *A Scheduling Approach to Coalitional Manipulation*, 2010.
28. International Conference on Autonomous Agents and Multiagent Systems (AAMAS). Title: *Aggregating Preferences in Multi-Issue Domains by Using Maximum Likelihood Estimators*, 2010.
29. International Joint Conference on Artificial Intelligence (IJCAI). Title: *Finite Local Consistency Characterizes Generalized Scoring Rules*, 2009.
30. International Joint Conference on Artificial Intelligence (IJCAI). Title: *A Dichotomy Theorem on the Existence of Efficient or Neutral Sequential Voting Correspondences*, 2009.
31. International Joint Conference on Artificial Intelligence (IJCAI). Title: *Complexity of Unweighted Coalitional Manipulation Under Some Common Voting Rules*, 2009.
32. ACM Conference on Electronic Commerce (EC). Title: *Generalized Scoring Rules and the Frequency of Coalitional Manipulability*, 2008.
33. ACM Conference on Electronic Commerce (EC). Title: *A Sufficient Condition for Voting Rules to Be Frequently Manipulable*, 2008.
34. National Conference on Artificial Intelligence (AAAI). Title: *Determining Possible and Necessary Winners under Common Voting Rules Given Partial Orders*, 2008.
35. National Conference on Artificial Intelligence (AAAI). Title: *Voting on Multiattribute Domains with Cyclic Preferential Dependencies*, 2008.
36. National Conference on Artificial Intelligence (AAAI). Title: *Strongly decomposable voting rules on multiattribute domains*, 2007.

IX. **Honors and Awards**
(List names and dates)

1. **2018** Rensselaer James M. Tien 66 Early Career Award.
2. **2017** Invited talk at IJCAI Early Career Spotlight Track.
3. **2015** IEEE Intelligent Systems. "AI's 10 to watch".
4. **2015** Simons-Berkeley Research Fellowship (funded visiting assistant professorship to Simons Institute at U.C. Berkeley on Economics and Computation)
5. **2015–2020** NSF CAREER Award
6. **2013** The Singapore National Research Foundation (NRF) Fellowship Award (declined).
7. **2012** AAMAS-12 best PC finalist
8. **2011** One of the 20 NSF Computing Innovation Fellows (CIFellows)
9. **2011** Duke CS Outstanding Ph.D. Dissertation Award
10. **2010** Duke CS Outstanding Departmental Service Award
11. **2010** Facebook Ph.D. Fellowship finalist
12. **2009** Duke CS Outstanding Ph.D. Research Initiation Project Award
13. **2007–2011** James B. Duke Fellowship

X. **Sabbatical leaves, off-campus study programs, foreign professional travel**
(Give dates and topics.)

Numerous foreign trips to present my research and to attend conferences and workshops; this foreign travel appears in Section VIII.

XI. **Other Activities**
(List other relevant activities such as consulting, (include name of company and days per year), expert witness, or significant activities not included in previous categories).

None

Signature: _____ Date: _____