

RUPERT FREEMAN

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APPOINTMENTS

University of Virginia Darden School of Business <i>Assistant Professor</i> Quantitative Analysis Group	2020-present
Microsoft Research <i>Postdoctoral Researcher</i> NYC Algorithmic Economics Group	2018-2020

EDUCATION

Ph.D. in Computer Science <i>Duke University</i> Advisor: Vincent Conitzer	2013-2018
Bachelor of Science (First Class Honours) in Mathematics <i>University of Auckland, New Zealand</i>	2009-2012

JOURNAL PUBLICATIONS

- Rupert Freeman, Jens Witkowski, Jennifer Wortman Vaughan, and David M. Pennock. *An Equivalence Between Fair Division and Wagering Mechanisms*. *Management Science*. (Supersedes the AAAI-19 paper below)
- Markus Brill, Rupert Freeman, Svante Janson, and Martin Lackner. *Phragmén's Voting Methods and Justified Representation*. *Mathematical Programming*, 2024. (Supersedes the AAAI-17 paper below)
- Haris Aziz, Rupert Freeman, Nisarg Shah, and Rohit Vaish. *Best of Both Worlds: Ex Ante and Ex Post Fairness in Resource Allocation*. *Operations Research*, 2024. (Supersedes the EC-20 paper below)
- Jens Witkowski, Rupert Freeman, Jennifer Wortman Vaughan, David M. Pennock, and Andreas Krause. *Incentive-Compatible Forecasting Competitions*. *Management Science*, 2023. (Supersedes the AAAI-18 paper below)
- Rupert Freeman, David M. Pennock, Dominik Peters, and Jennifer Wortman Vaughan. *Truthful Aggregation of Budget Proposals*. *Journal of Economic Theory*, 2021. (Supersedes the EC-19 paper below)
- Haris Aziz, Markus Brill, Vincent Conitzer, Edith Elkind, Rupert Freeman, and Toby Walsh. *Justified Representation in Approval-Based Committee Voting*. *Social Choice and Welfare*, 2017. (Supersedes the AAAI-15 paper below)

PEER-REVIEWED CONFERENCE PUBLICATIONS

- Rupert Freeman, Geoffrey Pritchard, and Mark C. Wilson. *Order Symmetry: A New Fairness Criterion for Assignment Mechanisms*. To appear in Proceedings of the 24th International Conference on Autonomous Agents and Multiagent Systems (AAMAS-25), Detroit, MI, 2025.
- Mark de Berg, Rupert Freeman, Ulrike Schmidt-Kraepelin, and Markus Utke. *Truthful Budget Aggregation: Beyond Moving-Phantom Mechanisms*. In Proceedings of the 20th Conference on Web and Internet Economics (WINE-24), Edinburgh, UK, 2024.

Soroush Ebadian, Rupert Freeman and Nisarg Shah. *Harm Ratio: A Novel and Versatile Fairness Criterion*. To appear in Proceedings of 4th ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization (EAAMO-24), San Luis Potosi, Mexico, 2024.

Rupert Freeman and Ulrike Schmidt-Kraepelin. *Project-Fair and Truthful Mechanisms for Budget Aggregation*. In Proceedings of the Thirty-Eighth AAAI Conference on Artificial Intelligence (AAAI-24), Vancouver, Canada, 2024.

Soroush Ebadian, Rupert Freeman, and Nisarg Shah. *Efficient Resource Allocation with Secretive Agents*. In Proceedings of the Thirty-First International Joint Conference on Artificial Intelligence (IJCAI-22), Vienna, Austria, 2022.

Rupert Freeman, Evi Micha, and Nisarg Shah. *Two-Sided Matching Meets Fair Division*. In Proceedings of the Thirtieth International Joint Conference on Artificial Intelligence (IJCAI-21), virtual, 2021.

Rupert Freeman, David M. Pennock, Daniel M. Reeves, David Rothschild, and Bo Waggoner. *Towards a Theory of Confidence in Market-Based Predictions*. In Proceedings of the Twelfth International Symposium on Imprecise Probabilities: Theories and Applications (ISIPTA-21), Granada, Spain, 2021.

Rupert Freeman, David M. Pennock, Chara Podimata, and Jennifer Wortman Vaughan. *No-Regret and Incentive-Compatible Online Learning*. In Proceedings of the Thirty-Seventh International Conference on Machine Learning (ICML-20), virtual, 2020.

Rupert Freeman, Nisarg Shah, and Rohit Vaish. *Best of Both Worlds: Ex-ante and Ex-Post Fairness in Resource Allocation*. In Proceedings of the 21st ACM Conference on Economics and Computation (EC-20), virtual, 2020.

Rupert Freeman, Anson Kahng, and David M. Pennock. *Representation in Approval Elections with a Variable Number of Winners*. In Proceedings of the Twenty-Ninth International Joint Conference on Artificial Intelligence (IJCAI-20), virtual, 2020.

Rupert Freeman, Sujoy Sikdar, Rohit Vaish, and Lirong Xia. *Equitable Allocations of Indivisible Chores*. In Proceedings of the Nineteenth International Joint Conference on Autonomous Agents and Multi Agent Systems (AAMAS-20), virtual, 2020.

Rupert Freeman, David M. Pennock, Dominik Peters, and Bo Waggoner. *Preventing Arbitrage from Collusion when Eliciting Probabilities*. In Proceedings of the Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI-20), New York City, New York, USA, 2020.

Rupert Freeman, Sujoy Sikdar, Rohit Vaish, and Lirong Xia. *Equitable Allocations of Indivisible Goods*. In Proceedings of the Twenty-Eighth International Joint Conference on Artificial Intelligence (IJCAI-19), Macao, China, 2019.

Rupert Freeman, David M. Pennock, Dominik Peters, and Jennifer Wortman Vaughan. *Truthful Aggregation of Budget Proposals*. In Proceedings of the 20th ACM Conference on Economics and Computation (EC-19), Pheonix, Arizona, USA, 2019.

Rupert Freeman, David M. Pennock, and Jennifer Wortman Vaughan. *An Equivalence Between Wagering and Fair-Division Mechanisms*. In Proceedings of the Thirty-Third AAAI Conference on Artificial Intelligence (AAAI-19), Honolulu, Hawaii, USA, 2019.

Vincent Conitzer, Rupert Freeman, Nisarg Shah, and Jennifer Wortman Vaughan. *Group Fairness for the Allocation of Indivisible Goods*. In Proceedings of the Thirty-Third AAAI Conference on Artificial Intelligence (AAAI-19), Honolulu, Hawaii, USA, 2019.

Rupert Freeman and David M. Pennock. *An Axiomatic View of the Parimutuel Consensus Wagering Mechanism*. In Proceedings of the Twenty-Seventh International Joint Conference on Artificial Intelligence (IJCAI-18), Stockholm, Sweden, 2018.

Rupert Freeman, Seyed Majid Zahedi, Vincent Conitzer, and Benjamin Lee. *Dynamic Proportional Sharing: A Game-Theoretic Approach*. In Proceedings of the ACM SIGMETRICS International Conference on Measurement and Modeling of Computer Systems, Irvine, California, USA, 2018.

Jens Witkowski, Rupert Freeman, Jennifer Wortman Vaughan, David M. Pennock, and Andreas Krause. *Incentive-Compatible Forecasting Competitions*. In Proceedings of the Thirty-Second AAAI Conference on Artificial Intelligence (AAAI-18), New Orleans, Louisiana, USA, 2018.

Rupert Freeman, Seyed Majid Zahedi, and Vincent Conitzer. *Fair and Efficient Social Choice in Dynamic Settings*. In Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence (IJCAI-17), Melbourne, Australia, 2017.

Vincent Conitzer, Rupert Freeman, and Nisarg Shah. *Fair Public Decision Making*. In Proceedings of the 18th ACM Conference on Economics and Computation (EC-17), Cambridge, Massachusetts, USA, 2017.

Rupert Freeman, David M. Pennock, and Jennifer Wortman Vaughan. *The Double Clinching Auction for Wagering*. In Proceedings of the 18th ACM Conference on Economics and Computation (EC-17), Cambridge, Massachusetts, USA, 2017.

Rupert Freeman, Sébastien Lahaie, and David Pennock. *Crowdsourced Outcome Determination in Prediction Markets*. In Proceedings of the Thirty-First AAAI Conference on Artificial Intelligence (AAAI-17), San Francisco, California, USA, 2017.

Markus Brill, Rupert Freeman, Svante Janson, and Martin Lackner. *Phragmén’s Voting Methods and Justified Representation*. In Proceedings of the Thirty-First AAAI Conference on Artificial Intelligence (AAAI-17), San Francisco, California, USA, 2017.

Rupert Freeman, Sam Haney, and Debmalya Panigrahi. *On the Price of Stability of Undirected Multicast Games*. In Proceedings of the Twelfth Conference on Web and Internet Economics (WINE-16), Montreal, Canada, 2016.

Haifeng Xu, Rupert Freeman, Vincent Conitzer, Shaddin Dughmi, and Milind Tambe. *Signaling in Bayesian Stackelberg Games*. In Proceedings of the Fifteenth International Joint Conference on Autonomous Agents and Multi Agent Systems (AAMAS-16), Singapore, 2016.

Markus Brill, Vincent Conitzer, Rupert Freeman, and Nisarg Shah. *False-Name-Proof Recommendations in Social Networks*. In Proceedings of the Fifteenth International Joint Conference on Autonomous Agents and Multi Agent Systems (AAMAS-16), Singapore, 2016.

Vincent Conitzer, Rupert Freeman, Markus Brill, and Yuqian Li. *Rules for Choosing Societal Tradeoffs*. In Proceedings of the Thirtieth AAAI Conference on Artificial Intelligence (AAAI-16), Phoenix, Arizona, 2016.

Markus Brill, Rupert Freeman, and Vincent Conitzer. *Computing Possible and Necessary Equilibrium Actions (and Bipartisan Set Winners)*. In Proceedings of the Thirtieth AAAI Conference on Artificial Intelligence (AAAI-16), Phoenix, Arizona, 2016.

Rupert Freeman, Markus Brill, and Vincent Conitzer. *General Tiebreaking Schemes for Computational Social Choice*. In Proceedings of the Fourteenth International Joint Conference on Autonomous Agents and Multi Agent Systems (AAMAS-15), Istanbul, Turkey, 2015.

Vincent Conitzer, Markus Brill, and Rupert Freeman. *Crowdsourcing Societal Tradeoffs*. In Proceedings of the Fourteenth International Joint Conference on Autonomous Agents and Multi Agent Systems (AAMAS-15) Blue Sky Ideas Track, Istanbul, Turkey, 2015.

Haris Aziz, Markus Brill, Vincent Conitzer, Edith Elkind, Rupert Freeman, and Toby Walsh. *Justified Representation in Approval-Based Committee Voting*. In Proceedings of the Twenty-Ninth AAAI Conference on Artificial Intelligence (AAAI-15), Austin, Texas, 2015.

Rupert Freeman, Markus Brill, and Vincent Conitzer. *On the Axiomatic Characterization of Runoff Voting Rules*. In Proceedings of the Twenty-Eighth AAAI Conference on Artificial Intelligence (AAAI-14), Quebec City, Canada, 2014.

WORKING PAPERS

Dana G. Popescu and Rupert Freeman. *Restock Alerts versus Waitlists: How to Manage Transient Excess Demand*.

Alex Brown, Rupert Freeman, and Korok Ray. *Incentive Mechanisms for AI: Theory and Evidence*.

RESEARCH INTERNSHIPS AND VISITS

Microsoft Research, NYC Summer 2016, 2017
Research Intern

Simons Institute for the Theory of Computing Fall 2015
Visiting student as part of the program on Economics and Computation

FELLOWSHIPS AND AWARDS

Duke Computer Science Department Outstanding Dissertation Award 2018
Facebook Ph.D. Fellowship 2017-2019
Duke Computer Science Department Outstanding Preliminary Exam Award 2016
Duke Computer Science Department Outstanding Teaching Assistant Award 2014

INVITED TALKS

Incentive-Compatible and Strongly Fair Cake Cutting
Duke University Fuqua School of Business, Decision Sciences Seminar September 2024

Preferences for Wealth Distributions in the Presence of Group Structure
2024 INFORMS Annual Meeting October 2024

Markets for Aggregation
Dagstuhl Seminar on Algorithms for Participatory Democracy July 2022

Order Symmetry: A New Fairness Criterion for Assignment Mechanisms
Frankfurt School of Finance & Management June 2021
2021 INFORMS Annual Meeting October 2021
Panthéon-Sorbonne University, Recent Advances in Fair Division Workshop November 2022

No-Regret and Incentive-Compatible Online Learning
2020 INFORMS Annual Meeting November 2020

Best of Both Worlds: Ex-ante and Ex-Post Fairness in Resource Allocation
2020 INFORMS Annual Meeting November 2020

Truthful Aggregation of Budget Proposals
Duke University, CS-Econ Seminar May 2019
Stanford University, Research on Algorithms and Incentives in Networks Seminar October 2019
UC Santa Cruz, AI for Social Good Guest Lecture October 2019
Online Social Choice and Welfare Seminar Series January 2021

Wagering Mechanisms: From Fair Division to No-Regret Learning
Rensselaer Polytechnic Institute, CS Colloquium October 2018
Yale University, CS/Econ Seminar December 2019
City University of Hong Kong, Summer School on Game Theory and Social Choice June 2022

An Equivalence Between Wagering and Fair-Division Mechanisms

Harvard University, EconCS Seminar

2019 INFORMS Annual Meeting

2023 INFORMS Annual Meeting

September 2018

October 2019

October 2023

TEACHING

Classes Taught

Decision Analysis 1 & 2

Data Visualization and Analytics

Tutorial Presentations

Recent Advances in Fair Resource Allocation

ACM Conference on Economics and Computation (EC)

June 2019

AAAI Conference on Artificial Intelligence

February 2020

International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)

May 2020

Teaching Assistantships

Duke University: Crowdsourcing Societal Tradeoffs

Spring 2015

Duke University: Discrete Mathematics for Computer Science

Spring, Fall 2014

SERVICE

Program Chair: 8th International Conference on Algorithmic Decision Theory (ADT 2024)

Senior Program Committee: IJCAI (2021), AAAI (2023), EC (2023), AAMAS (2024)

Program Committee: AAAI (2018, 2019, 2020), IJCAI (2018 [distinguished reviewer, among top 2%], 2019, 2020), EC (2019, 2021, 2022), WebConf (2022), AISTATS (2018), AIES (2023)

Journal Reviewing: Social Choice and Welfare, Journal of Artificial Intelligence Research, Artificial Intelligence Journal, Discrete Optimization, Journal of Autonomous Agents and Multi-Agent Systems, Optimization Letters, Naval Research Logistics, Operations Research, Management Science, Decision Analysis, ACM Transactions on Economics and Computation, Economics Letters, Mathematics of Operations Research, ACM Transactions on Interactive Intelligent Systems, SIAM Journal on Discrete Mathematics, Games and Economic Behavior

Organizing Committee for Advances in Decision Analysis (ADA) 2022 Conference

Session Organizer, 2022 INFORMS Annual Meeting