Vignesh Viswanathan

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Education

PhD in Computer Science
University of Massachusetts, Amherst   *July 2020 – July 2026 (Expected)*
Advisor: Yair Zick

BTech in Computer Science And Engineering
Indian Institute of Technology, Kharagpur   *June 2016 – May 2020*
CGPA: 9.71/10

Research Interests

Fair Allocation, Mechanism Design, Graph Theory

Selected Awards and Honors

2022: Received the **College Outstanding Synthesis Award** for the academic year 2021-2022

2021: Received the **Robin Popplestone Graduate Fellowship**

2020: **Ranked 3rd** among all the computer science undergraduate students at IIT, Kharagpur

2019: Received the **IIT KGP Foundation Award** to support my internship at NUS, Singapore

Work Experience

Adobe Research   **Mentor: Raghav Addanki**
Research Intern in the Data Science Lab   *Summer, 2024*
Worked on improving the latency of large language models and AI assistants.

Microsoft Research   **Mentors: Tobias Schnabel and Robert Ness**
Research Intern in the Causal Machine Learning Group   *Summer, 2022*
Worked on designing and evaluating attribution methods in sequential decision problems.

Journal Publications

Vignesh Viswanathan and Yair Zick. *A General Framework For Fair Allocation under Matroid Rank Valuations.* Transactions on Economics and Computation, 2025.

Jenny Hamer, Nicholas Perello, Jake Valladares, **Vignesh Viswanathan** and Yair Zick. *Simple Steps to Success: A Method for Step-Based Counterfactual Explanations.* Transactions of Machine Learning Research, 2024.

Hadi Hosseini, Andrew McGregor, Justin Payan, Rik Sengupta, Rohit Vaish and **Vignesh Viswanathan**. *On the Hardness of Fair Allocation under Ternary Valuations.* Journal of Autonomous Agents and Multi-agent Systems, 2024.

Conference Publications

Zhengmian Hu, Tong Zheng, **Vignesh Viswanathan**, Ziyi Chen, Ryan A Rossi, Yihan Wu, Dinesh Manocha, Heng Huang. *Towards Optimal Multi-draft Speculative Decoding.* In Proceedings of the 13th International Conference on Learning Representations (ICLR), 2025.

Zack Fitzsimmons, **Vignesh Viswanathan** and Yair Zick. *On the Hardness of Fair Allocation under Ternary Valuations.* In Proceedings of the 24th International Conference on Autonomous Agents and Multi-agent Systems (AAMAS), 2025.

Hadi Hosseini, Andrew McGregor, Rik Sengupta, Rohit Vaish and **Vignesh Viswanathan**. *Tight Approximations for Graphical House Allocation.* In Proceedings of the 23rd International Conference on Autonomous Agents and Multi-agent Systems (AAMAS), 2024.

Gagan Biradar, Yacine Izza, Elita Lobo, **Vignesh Viswanathan** and Yair Zick. *Axiomatic Aggregations of Abductive Explanations.* In Proceedings of the 38th AAAI Conference on Artificial Intelligence (AAAI), 2024.

Cyrus Cousins, **Vignesh Viswanathan** and Yair Zick. *The Good, the Bad and the Submodular: Fairly Allocating Mixed Manna Under Order-Neutral Submodular Preferences.* In Proceedings of the 19th Conference on Web and Internet Economics (WINE), 2023.

Cyrus Cousins, **Vignesh Viswanathan** and Yair Zick. *Dividing Good and Great Items Among Agents with Bivalued Submodular Valuations.* In Proceedings of the 19th Conference on Web and Internet Economics (WINE), 2023.

Vignesh Viswanathan and Yair Zick. *A General Framework For Fair Allocation with Matroid Rank Valuations.* In Proceedings of the 24th ACM Conference on Economics and Computation (EC), 2023.

Hadi Hosseini, Justin Payan, Rik Sengupta, Rohit Vaish and **Vignesh Viswanathan**. *Graphical House Allocation.* In Proceedings of the 22nd International Conference on Autonomous Agents and Multi-agent Systems (AAMAS), 2023.

Justin Payan, Rik Sengupta and **Vignesh Viswanathan**. *Relaxations of Envy-Freeness Over Graphs.* In Proceedings of the 22nd International Conference on Autonomous Agents and Multi-agent Systems (AAMAS), 2023. (Extended Abstract)

Vignesh Viswanathan, Megha Bose and Praveen Paruchuri. *Moving Target Defense under Uncertainty for Web Applications.* In Proceedings of the 21st International Conference on Autonomous Agents and Multi-agent Systems (AAMAS), 2022. (Extended Abstract)

Omer Lev, Neel Patel, **Vignesh Viswanathan** and Yair Zick. *The Price is (Probably) Right: Learning Market Equilibria from Samples.* In Proceedings of the 20th International Conference on Autonomous Agents and Multi-agent Systems (AAMAS), 2021.

Hau Chan, Long Tran-Thanh and **Vignesh Viswanathan**. *Fighting Wildfires under Uncertainty: A Sequential Resource Allocation Approach.* In Proceedings of the 29th International Joint Conference on Artifical Intelligence (IJCAI), 2020.

Others

Arpita Biswas, Justin Payan, Rik Sengupta and **Vignesh Viswanathan**. *The Theory of Fair Allocation Under Structured Set Constraints*. Book Chapter in Ethics in Artificial Intelligence: Bias, Fairness and Beyond (Springer), 2023.

Vignesh Viswanathan. *Computing using Samples: Theoretical Guarantees with the Direct Learning Approach*. In Proceedings of the Doctoral Consortium of the 20th International Conference on Autonomous Agents and Multi-agent Systems (AAMAS), 2021.

Talks

AMD Workshop at FSTTCS 2024
Fair Allocation under Simple Valuations *2024*

Adobe Data Science Lab Talk Series
An Introduction to Computational Fair Division *2024*

Theory Reading Group, Dartmouth College
Yankee Swap: A Fast and Simple Fair Allocation Mechanism for Matroid Rank Valuations *2023*

COMSOC, Haifa, Israel and University of Waterloo
Learning Market Equilibria from Samples *2021*

Teaching

Teaching Assistant
CS 590T: Algorithmic Fairness and Strategic Behaviour *Fall 2022*

Teaching Assistant
CS 611: Advanced Algorithms *Spring 2025*

Service

UMass Theory Seminar
Help organize weekly talks at the UMass theory seminar *2023 onwards*

Program Committee
GAIW Workshop (AAMAS) 2025, CFD Workshop (IJCAI) 2024, CFD Workshop (IJCAI) 2023

Reviewer and/or Sub-reviewer
STACS 2024, CIKM 2022, WWW 2021, ICLR 2021, NeurIPS 2020