

CHENGHAN ZHOU

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RESEARCH INTERESTS

Algorithmic Game Theory, Algorithmic Mechanism Design, Computational Economics

EDUCATION

University of Virginia, Charlottesville, Virginia
B.A. in Computer Science & Cognitive Science

Aug 2017 - Dec 2020
GPA: 3.97/4.0

Princeton University, Princeton, New Jersey
M.S.E. in Computer Science

Sep 2022 - Present
GPA: 4.0/4.0

RESEARCH EXPERIENCE

Princeton University, Theory of Computation Group

Sep. 2022 – Present

- Advisor: Professor [Matt Weinberg](#).
- Research Topics: Mechanism Design in Cryptocurrency.
- Research Focus:

Characterize statistical detectable strategies from a macroscopic perspective and explore how the design of blockchain protocols influences detectability of selfish behaviors.

Construct model for blockchain payment system and centralized payment system using upstream/downstream model from Industrial Organization theory and reason about pros and cons for decentralization.

Princeton University, Theory of Computation Group

Dec. 2022 – Present

- Research Advisor: Professor [Mark Braverman](#).
- Research Topics: VCG mechanism for two-sided matching.
- Research Focus: Attempt to understand APEX algorithm from [Optimization-Friendly Generic Mechanisms without Money](#) in two-sided matching markets by defining equilibrium concept, externality and VCG price implications.

Shanghai University of Finance and Economics, Institute for Theoretical Computer Science

Sep. 2021 – Jun. 2022

- Advisor: Professor [Pinyan Lu](#).
- Research Topics: Mechanism Design, Combinatorial Auctions, Approximation Algorithms.
- Research Focus: Improved approximation ratio of combinatorial auctions with interdependent valuations under incentive-compatible constraints.

University of Virginia, Strategic Intelligence for Machine Agents Lab

Jan. 2019 – Jul. 2022

- Advisor: Professor [Haifeng Xu](#).
- Research Topics: Information Design, Convex Optimization, Complexity.
- Research Focus: Identified possibilities and limits of algorithmic information design in congestion games and security games for social welfare maximization.

PUBLICATIONS

(α - β) *Pinyan Lu, Enze Sun, Chenghan Zhou, Better Approximation for Interdependent SOS Valuations*, In Proc. of the 18th Conference on Web and Internet Economics (WINE 2022) [[arxiv](#)].

Chenghan Zhou, Andrew Spivey, Haifeng Xu, Thanh H. Nguyen, Information Design for Multiple Uncoordinated Defenders: Work Less, Pay Off, In Proc. of the Conference on Uncertainty in Artificial Intelligence (UAI 2022), also accepted to [MDPI Games Journal](#).

Chenghan Zhou, Thanh H. Nguyen, Haifeng Xu, Algorithmic Information Design in Multi-Player Games: Possibility and Limits in Singleton Congestion, In Proc. of the 23rd ACM Conference on Economics and Computation (EC 2022) [[arxiv](#)].

INDUSTRIAL EXPERIENCE

NetEase Game Department, Algorithm Engineer Intern

Jun. 2021 – Aug. 2021

- Designed a skill-point allocation algorithm with max-flow min-cost that can dynamically recommend skill-point strategy based on different lineup matches. Implemented statistical inference, Bayesian Neural Networks and Simplex algorithm for max-flow min-cost in Python 2.7 without any dependency.
- Integrated the algorithm with the game codebase and released this feature to over 100 million players.

Google LLC, Pigweed Project, Software Engineer Intern

May. 2020 – Aug. 2020

- Added automated test for QEMU simulator and improved performance of 2~3 seconds on Mac OS in Python.
- Replaced C library's dynamic memory allocation in C++, GN, linked script and design tooling API to provide memory summary. visualized heap fragmentation, detect heap corruption, create prototype of debug information, etc.

SERVICE

Program Committee for AFT'23.

Sub-reviewer for ITCS'24.

AWARDS

CRA Undergraduate Research Awards, *Honorable Mentions*

2020

Women in CyberSecurity Conference, *Scholarship*

2019

Dean's List

Fall 2017, Fall/Spring 2018, Spring/Fall 2019

TEACHING

Theory of Computation (COS487), *teaching assistant*

Princeton 2023F

Economics and Computation (COS445), *teaching assistant & preceptor*

Princeton 2023S

Theory of Algorithms (COS423), *teaching assistant & preceptor*

Princeton 2022F

Artificial Intelligence (CS4710), *teaching assistant*

UVA 2020S

Computer Architecture (CS3330), *teaching assistant*

UVA 2019F

Algorithm (CS4102), *teaching assistant*

UVA 2019F