Chenyang Yuan

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Education

PhD in Electrical Engineering and Computer Science 2018–Present
Massachusetts Institute of Technology, Cambridge, MA GPA: 5/5

MS in Electrical Engineering and Computer Science 2016 – 2018
Massachusetts Institute of Technology, Cambridge, MA GPA: 5/5
Thesis: Focused Polynomials, Random Projections and Approximation Algorithms for Polynomial Optimization over the Sphere

BA in Computer Science 2012–2016
The University of Berkeley at California, Berkeley, CA GPA: 3.94/4

Research

Benoît Legat*, **Chenyang Yuan*** and Pablo Parrilo, "Low Rank Sum of Squares Has No Spurious Local Minima", *In preparation*

Chenyang Yuan and Pablo Parrilo, "Rounding Semidefinite Relaxations of Quadratic Maps", *In preparation*

Chenyang Yuan and Pablo Parrilo, "Semidefinite Relaxations of Products of Nonnegative Forms on the Sphere", *Preprint, arxiv*

Chenyang Yuan and Pablo Parrilo, "Maximizing Products of Linear Forms, and the Permanent of Positive Semidefinite Matrices", *Mathematical Programming Series A*

J. Thai, **C. Yuan**, A. Bayen, "Resiliency of Mobility-as-a-Service Systems to Denial-of-Service Attacks", *IEEE Transactions on Control of Network Systems*

C. Yuan, J. Thai, A. Bayen, "ZUbers against ZLyfts Apocalypse: An Analysis Framework for DoS Attacks on Mobility-as-a-Service Systems", *ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS)*

Internships

Research Intern, *Lyft Inc.* *June – September 2016*

- Worked with locations team on estimation of travel times using real-time traffic data derived from driver GPS routes.

Undergraduate Student Researcher, *UC Berkeley* *Spring 2015 – Spring 2016*

- With professor Alex Bayen's group, worked on applying optimization to traffic control, inferring route flows of cars from cellular connection data and using queueing theory to investigate possible attacks on on-demand rideshare networks.

Undergraduate Student Researcher, *UC Berkeley* *Spring 2014 – Spring 2015*

- With professor Ras Bodik's group on the synthesis of a layout engine for an experimental browser, Servo, using SAT/SMT solvers.

Software Engineering Intern, *Clover Network Inc.* *June – September 2013*

- Amongst other projects, designed and built an API auto-documentation system and API Explorer.

Programming Skills

Proficient in Python, Julia, PyTorch, Javascript, LaTeX, Emacs, Git, Docker

Experience in Java, C, Rust, Haskell, Scheme, HTML/CSS, Android, SQL, Assembly

Talks

MIT LIDS and Stats Tea Talk *Dec 2021*

INFORMS Annual Meeting Optimization in Julia Session *Oct 2021*

Fields Institute Workshop on Real Algebraic Geometry and Algorithms *Jun 2021*

MIT LIDS Student Conference *Jan 2021*

MIT CS Theory Lunch *Feb 2020*

Teaching

Algebraic Techniques and Semidefinite Programming, *MIT* — *Spring 2021*

Linear Algebra and Optimization, *MIT* — *Fall 2020/2021*

Nonlinear Optimization, *MIT* — *Spring 2020*

Efficient Algorithms and Intractable Problems, *UC Berkeley* — *Spring 2016*

Designing Information Devices and Systems, *UC Berkeley* — *Fall 2015*

TA for Structure and Interpretation of Computer Programs, *UC Berkeley* — *Fall 2013 – Fall 2014*

Math Olympiad Trainer, *National University of Singapore High School* — *March 2012*

Physics Olympiad Trainer, *National University of Singapore High School* — *March-August 2012*

Selected Software Projects

SumOfSquares.py `https://github.com/yuanchenyang/SumOfSquares.py`
Sum of squares optimization modeller built on top of picos. Features easy access to pseudoexpectation operators for both formulating problems and extracting solutions via rounding algorithms

Interactive SICP Textbook / coding.js `http://xuanji.appspot.com/isicp/1-1-elements.html`
An interactive version of the classic Structure and Interpretation of Computer Programs book, created together with a friend. I wrote the asynchronous Javascript-based Scheme interpreter used on the website.

Selected Awards

Outstanding Course Development and Teaching Award, for developing a new linear algebra course (EE16A) at UC Berkeley — *May 2016*

First Place, Cal vs Stanford Big Hack — *Apr 2013*
Created a scheme interpreter in C on my TI-89 graphing calculator

Honorable Mention, 12th Asian Physics Olympiad — *May 2011*
One of the 8 students representing Singapore in this competition.

Reviewing Experience

Optimization Letters; Journal of Combinatorics; International Colloquium on Automata, Languages, and Programming (ICALP); Sum of Squares: Theory and Applications (book chapter)

Selected Coursework

CS: *Berkeley:* Graduate Algorithms and Theory, Compilers, Security, AI, Randomized Algorithms. *MIT:* Advanced Algorithms, Inference and Information, Geometric Computing, Algebraic Techniques and Semidefinite Programming

EE: *Berkeley:* Information Theory, *MIT:* Dynamic Systems and Control

Math: *Berkeley:* Complex Analysis, Honors Abstract Algebra. *MIT:* High-dimensional Statistics

Physics: *Berkeley:* Analytical Mechanics, Quantum Mechanics, General Relativity, Electronics Lab