

# ISAAC GROSOFF

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## RESEARCH INTERESTS

Optimization and performance analysis of stochastic computing systems, especially multiserver systems.

## CURRENT RESEARCH

Analyzing previously intractable multiserver scheduling policies, incentive-compatible scheduling, known-size dispatching.

## EDUCATION

**2017 - pres:** Pursuing PhD in Computer Science. Carnegie Mellon University, Pittsburgh, PA.  
Advisor: Prof. Mor Harchol-Balter

**2013 - 2017:** M.E. and B.S. in Computer Science. Massachusetts Institute of Technology, Cambridge, MA. GPA 4.96/5  
Master's Thesis in information-theoretic cryptography: "Secure communication: CDS, PIR, PSM"  
Master's Advisor: Prof. Vinod Vaikunathanathan  
Bachelor's Advisor: Prof. Frans Kaashoek

## REFEREED PUBLICATIONS

Isaac Grosf, Kunhe Yang, Ziv Scully, Mor Harchol-Balter. "Nudge: Stochastically improving upon FCFS." *Proceedings of the ACM Measurement and Analysis of Computer Systems – SIGMETRICS: Volume 5, Number 2, Article 99 (2021)*, pp. 99:1 – 99:25, June 2021, Beijing, China.

**Winner of SIGMETRICS 2021 Best Paper Award.**

Ziv Scully, Isaac Grosf and Mor Harchol-Balter. "The Gittins Policy is Nearly Optimal in the M/G/k under Extremely General Conditions." *Proceedings of the ACM Measurement and Analysis of Computer Systems – SIGMETRICS: Volume 4, Number 3, Article 43 (Dec 2020)*, pp. 43:1 – 43:29, June 2021, Beijing, China.

Ziv Scully, Isaac Grosf, Mor Harchol-Balter. "Optimal Multiserver Scheduling with Unknown Job Sizes in Heavy Traffic." *38th International Symposium on Computer Performance, Modeling, Measurements, and Evaluation (Performance 2020)*, Milan, Italy, November 2020.

Ben Berg, Daniel Berger, Sara McAllister, Isaac Grosf, Sathya Gunasekar, Jimmy Lu, Michael Uhlar, Jim Carrig, Nathan Beckmann, Mor Harchol-Balter, Greg Ganger. "The CacheLib Caching Engine: Design and Experiences at Scale." 14th USENIX Symposium on Operating Systems Design and Implementation (OSDI 2020), Banff, Canada, November 2020.

Isaac Grosf, Ziv Scully, Mor Harchol-Balter. "Load Balancing Guardrails: Keeping Your Heavy Traffic on the Road to Low Response Times." *Proceedings of the ACM Measurement and Analysis of Computer Systems – SIGMETRICS: Volume 3, Issue 2, Article 42 (June 2019)*, pp. 42:1 – 42:31, 2019.

Conference version appeared in *Proceedings of ACM Simetrics/Performance 2019 Conference on Measurement and Modeling of Computer Systems (SIGMETRICS 19)*, Pheonix, AZ. June 2019.

**Winner of SIGMETRICS 2019 Best Student Paper Award.**

Isaac Grosf, Ziv Scully, Mor Harchol-Balter. "SRPT for Multiserver Systems." *Performance Evaluation*, vol. 127-128, Nov. 2018, pp. 154-175.

Conference version appeared in *36th International Symposium on Computer Performance, Modeling, Measurements, and Evaluation (Performance 2018)*, Toulouse, France, December 2018.

**Winner of Performance 2018 Best Student Paper Award.**

Erik D. Demaine, Isaac Grosf, Jayson Lynch, and Mikhail Rudoy. "Computational Complexity of Motion Planning of a Robot through Simple Gadgets." *Ninth International Conference on Fun with Algorithms*. La Maddalena, Italy. 2018.

Erik D. Demaine, Isaac Grosf, and Jayson Lynch. “Push-Pull Block Puzzles are Hard.” *International Conference on Algorithms and Complexity*. Athens, Greece. 2017.

Benjamin Grosf, Janine Bloomfield, Paul Fodor, Michael Kifer, Isaac Grosf, Miguel Calejo, and Theresa Swift. “Automated Decision Support for Financial Regulatory/Policy Compliance, using Textual Rulelog.” *RuleML 2015*. Berlin, Germany. 2015.

## OTHER PUBLICATIONS

Isaac Grosf. “Open Problem - M/G/k/SRPT Under Medium Load.” *Stochastic Systems*. Sep. 2019.

## UNIVERSITY SERVICE

2021: Organizer of Computer Science Department (CSD) Introductory Course, which introduces new PhD students to the department.

2020-21: CSD Admissions Committee member for the Theory group, reviewed  $\sim 200$  applications.

2020: Led events for CSD Open House.

## PROFESSIONAL SERVICE

Reviewed papers for ACM SIGMETRICS, IFIP Performance, Management Science, and IEEE/ACM Transactions on Networking.

## EMPLOYMENT

**Summer 2019:** Facebook, Menlo Park, CA.

- Research Intern to develop a machine-learning-based SSD admission policy for Facebook’s Tao caching architecture.
- Improved the tradeoff between hit ratio and SSD write rate.

**Summer 2018:** Microsoft Research, Seattle, WA.

- Research Intern to develop novel FPGA algorithms for linear algebra and solving linear programs.

**Summer 2016:** Jane Street Capital, LLC, New York City, NY.

- Software developer for non-obtrusive data collection about in-house trading.
- Software developer responsible for updating trading simulation package to accommodate new trade specification format.

**Summer 2015:** Coherent Knowledge, Seattle, WA.

- Knowledge Engineer to build demonstrations for the financial and natural language domains using the declarative logic programming language Ergo.

**2013 - 2014:** MIT Undergraduate Research Opportunities Program, Cambridge, MA.

- Researcher in Complexity Theory proving computational hardness of block puzzles and related agent motion problems.

**Summer 2014:** EMC Isilon, Seattle, WA.

- Software developer to replace the previous ad-hoc build platform with a modern Jenkins-based build platform.

## PROJECTS

**2014 - pres:** Author of new programming language: *Pyth*

- Pyth is one of the best programming languages for solving tasks with the shortest possible programs.
- Pyth is an open-source language written in Python which has an online interpreter and detailed documentation.
- Available at <https://github.com/isaacg1/pyth>