ISAAC GROSOF

Computer Science Department
Carnegie Mellon University
Pittsburgh, PA, 15213

isaacg1.github.io
igrosof@cmu.edu
(206) 718-6712

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 Vaikunatanathan
Bachelor's Advisor: Prof. Frans Kaashoek

REFEREED PUBLICATIONS

Isaac Grosof, 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 Grosof 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 Grosof, 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 Grosof, 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 Grosof, 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 Grosof, Ziv Sculy, 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 Grosof, 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 Grosof, and Jayson Lynch. "Push-Pull Block Puzzles are Hard." *International Conference on Algorithms and Complexity*. Athens, Greece. 2017.

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

OTHER PUBLICATIONS

Isaac Grosof. "Open Problem - M/G/k/SRPT Under Medium Load." *Stochastic Systems*. Sep. 2019.

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`