



William K. Schwartz, Ph.D.

Associate Director

Professional Experience

Dr. Schwartz has over a decade of experience as a business strategy, data science, and economics consultant. His work has included quantitative modeling and optimization of economic data and business decisions; advising bidders in major-asset auctions on strategy and building software for auction analysis and training; and case management for testifying experts in commercial and antitrust litigation.

Dr. Schwartz has provided strategic advice to the senior management of some of the biggest telecommunications firms worldwide, and his advice, analysis, and algorithms have powered their auction decision making.

He has designed and built for clients numerous turnkey and custom software solutions, including econometric analyses, auction winner determination and pricing programs, multiple practice-auction platforms and bid-tracking systems, bid visualization tools, data pipelines, and market demand forecasting tools. Additionally, he has overseen and trained teams of data and software engineers and instituted quality-assurance best practices.

Dr. Schwartz's has extensive experience in both case management and technical analyses for merger reviews and litigation involving class certification, monopolization claims, and damages estimation. These cases have involved a range of industries, including electricity markets, automobile insurance, healthcare, cable set-top boxes, casinos, athletic shoes, oil and gas, hydroponics, clinical experiment design, interstate retail, and pharmaceutical patents.

His ongoing research encompasses algorithm design in statistics and optimization.

Contact Details

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Professional History

- Secretariat Economists
- Illinois Institute of Technology
- Ingraham & Schwartz Auction Advisers
- Economists Incorporated
- Navigant Economics
- Empiris

Education

- Ph.D. Applied mathematics, Illinois Institute of Technology
- BA *cum laude*, Economics (with honors) and mathematics, Northwestern University

Practice Areas

- Business strategy
- Data science
- Auctions
- Electricity markets
- Antitrust and mergers
- Commercial litigation
- Software development
- Statistics and econometrics
- Optimization

Representative Engagements

Auctions

- Canada's 3800 MHz Auction for Innovation, Science, and Economic Development (ISED) Canada (2022-): Testing of the auctioneer's third-party online auction platform and verification of winner and price determination in assignment stage expected in 2023

- US's 2.6 GHz Auction (2022) for AT&T: Bid management and visualization software
- US's RDOF Auction (2020) for Starry: Bid optimization software
- US's C-Band Auction (2019–2021) for AT&T: Bid management and visualization software
- Canada's 600 MHz Auction (2019) for Shaw Communications: Advice while bidding in the auction as well as auction-solving and bid visualization software; helped Shaw win 26% of MHz-pop supply for only 14% of auction revenue
- Canada's 2.6 GHz Auction (2015) for WIND Mobile: Advice to prepare for and while bidding in the auction as well as bid management software
- US's 600 MHz Incentive Auction (2013–2015) for T-Mobile: Regulatory advice relating to broadcast encumbrance of spectrum and broadcaster-repacking software; Dr. Schwartz's custom software was central to T-Mobile's regulatory filings in the runup to the auction
- US's AWS-3 Auction (2014–2015) for AT&T: Advice to prepare for the auction
- UK's 4G Auction (2012–2013) for Everything Everywhere: Advice to prepare for and while bidding in the auction as well as auction-solving and bid visualization software; helped EE win 33% of supply while only paying 25% of auction revenue
- Taiwan's LTE Auction (2013) for FarEasTone: Advice while bidding in the auction as well as bid management software
- Singapore's 4G Auction (2013) for StarHub: Bid management software
- Hong Kong's Supplementary 2.6 GHz Auction (2013) for CSL: Advice to prepare for and while bidding in the auction

Antitrust and Commercial Litigation

- *SS Management LLC v. Harveys Tahoe Management Company, LLC et al.* (2022–2023): Case manager for Dr. Keith Waehrer
- *State of Washington v. Johnson & Johnson et al.* (2022–): Analyzed a dynamic Markov model of opioid-misuse epidemiology for Dr. David Argue
- Confidential consulting relating to class certification in four insurance matters
- Case management for expert testimony by Dr. Hal Singer on class certification, market definition, market power, and damages in private actions against major cable providers for tying set-top box rental to cable service

Publications and Presentations

- Gurrea, S. & Schwartz, W. K. (2023, Apr. 25). "A Primer on Big Data for Litigators, Investigators, and Regulators." *American Bar Association Antitrust Committee Newsletter*.
URL: https://www.americanbar.org/groups/antitrust_law/resources/newsletters/primer-on-big-data/.

- Schwartz, W. K., Petrović, S., & Kaul, H. (2022, Dec. 13). "Longitudinal network models and permutation-uniform Markov chains." *Scandinavian Journal of Statistics*. DOI: [10.1111/sjos.12630](https://doi.org/10.1111/sjos.12630). arXiv: [2108:05555 \[stat.ME\]](https://arxiv.org/abs/2108.05555).
URL: <https://onlinelibrary.wiley.com/share/author/HDQAAMX4IU32BQ2YXYER?target=10.1111/sjos.12630>.
- Schwartz, W. K. (2021, November 10). *Algorithms for Discrete Data in Statistics and Operations Research* (Doctoral dissertation). Dept. of Applied Mathematics, College of Computing, Illinois Institute of Technology. Available at <http://hdl.handle.net/10560/islandora:1011986>.
- Schwartz, W. K., Ingraham, A. T., Ravi, S., & Sojourner, C. T. (2019, October 22). *Explaining and validating second prices for combinatorial auctions* (presentation No. 2). Presented at the [2019 INFORMS Annual Meeting](#). Abstract available at <https://www.abstractsonline.com/pp8/#!/6818/presentation/12350>.
- Schwartz, W. K. (2019, October 22). *The lexicographic winner determination problem (WDP) for real world combinatorial auctions: Tie breaking, side constraints, and dynamic programming* (poster No. 48). Presented at the [2019 INFORMS Annual Meeting](#). Abstract available at <https://www.abstractsonline.com/pp8/#!/6818/presentation/12274>.
- Bono, J., Ingraham, A. T., Ravi, S., Schwartz, W. K., & Sojourner, C. (2019, September 20). *An analysis of allocation phase pricing and clock round price increases in the Canadian 600 MHz auction*. SSRN: [3463933](https://ssrn.com/abstract=3463933).
- Schwartz, W. K. (2016, October 21). "The Broadcaster-Repacking Problem." arXiv: [1610.06672 \[cs.DS\]](https://arxiv.org/abs/1610.06672).
- Schwartz, W. K. (2017, October). *Introduction to cryptography for group theorists*. Guest lecture. Introduction to Abstract Algebra, Illinois Institute of Technology.
- Schwartz, W. K. (2017, February). *Introduction to Git for Scientific Programming*. Public lecture. SIAM, IIT chapter.
- Ingraham, A. T., Schwartz, W. K. (2014, April). *Basic topics in auction pricing*. Guest lecture. Strategic Pricing, McDonough School of Business, Georgetown University.

Honors

- Oxford University, Summer School on Economic Networks. Housing bursary. June 2018.
- National Science Foundation. Graduate Research Fellowship Program. Honorable mention. 2016.

Open-Source Contributions

- Author of [WrapItUp](#). Python timer to interrupt long-running calculations.
- Author of [PiGoSAT](#). Go-language interface to the Picosat SAT solver.

Merged Pull Requests

- Cython. [Fix #3047: Add PyMem \(Raw\)Calloc to cpython.mem](#). Cython. Merged Dec. 6, 2021.
- Django. [Fixed #32317 -- Refactored loaddata command to make it extensible](#). Python. Merged May 18, 2021.

- PyOxidizer. [Fix #337: Add __path__ filtering to OxidizedFinder's pkgutil.iter_modules support](#). Rust. [Merged](#) Apr. 13, 2021.
- Django. [Fixed #32316 -- Deferred accessing __file__](#). Python. Merged Apr. 1, 2021.
- Django. [Refs #32105 -- Moved ExceptionReporter template paths to properties](#). Python. Merged Mar. 31, 2021.
- PyOxidizer. [Fix #346: pyembed: BUG: Cleanup temp dir in OxidizedResourceCollector.oxidize](#). Rust. [Merged](#) Feb. 26, 2021.
- AppScript. [Silence deprecation warning on Python 3.8+](#). C. Merged Jan. 23, 2021.
- PyWin32. [Simplify pywin32 bootstrap, avoid importing site](#). Python. Merged Jan. 20, 2021.
- Python. [\[3.8\] bpo-42531: Teach importlib.resources.path to handle packages without __file__](#). Python. Merged Jan. 16, 2021.
- Django. [Fixed #32314 -- Fixed detection when started non-django modules with "python -m" in autoreloader](#). Python. Merged Jan. 6, 2021.
- Django. [Simplified django.db.utils.load_backend\(\)](#). Python. Merged Jan. 4, 2021.
- PyOxidizer. [pyembed: API: MainPythonInterpreter ownership prevents runtime errors](#). Rust. [Merged](#) Dec. 31, 2020.
- PyOxidizer. [#345: pyembed: BUG: SIGSEGV crash in safe code](#). Rust. [Merged](#) Dec. 30, 2020.
- Django. [Fixed #32302 -- Allowed migrations to be loaded from regular packages with no __file__ attribute](#). Python. Merged Dec. 29, 2020.
- PyOxidizer. [Fix #321: Backslashes in module search paths](#). Rust. [Merged](#) Nov. 13, 2020.
- Django. [Fixed #32183 -- Fixed shell crash when passing code with nested scopes](#). Python. Merged Nov. 11, 2020.
- Django. [Fixed #32177 -- Made execute_from_command_line\(\) use program name from the argv argument](#). Python. Merged Nov. 10, 2020.
- XLWings. [Remove comtypes requirement](#). Python. Merged Nov. 2, 2020.
- Comtypes. [BUILD: End bdist_wininst support in setup.py](#). Python. Merged July 28, 2020.
- NetworkX. [Add barycenter algorithm. Python](#). Merged May 2, 2019.
- Mypy. [Refs #5383: Document that aliasing dataclass fails](#). Python. Merged Aug. 2, 2018.
- NetworkX. [Show max iterations in non-convergence error for Katz centrality](#). Python. Merged Mar. 14, 2014.