

David J. Eckman

CONTACT INFORMATION

2145 Sheridan Road
Tech C210
Evanston, IL 60208

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RESEARCH INTERESTS

Decision-making under uncertainty: optimization via simulation, stochastic optimization, simulation analysis methodology, discrete-event simulation

ACADEMIC APPOINTMENTS

Assistant Professor August 2021 to present
Department of Industrial and Systems Engineering, Texas A&M University

Postdoctoral Research Fellow July 2019 to July 2021
Department of Industrial Engineering & Management Sciences, Northwestern University

- Supervisors: Professors Matthew Plumlee and Barry L. Nelson
- Focus: Output analysis for optimization via simulation

EDUCATION

Cornell University

Ph.D., Operations Research, May 2019

- Dissertation: Reconsidering Ranking-and-Selection Guarantees
- Adviser: Professor Shane G. Henderson

M.S., Operations Research, May 2017

University of Pittsburgh

B.S., Industrial Engineering, April 2014

SUBMITTED JOURNAL PUBLICATIONS

Eckman, D. J., M. Plumlee, and B. L. Nelson. Plausible Screening Using Functional Properties for Simulations with Large Solution Spaces. Under review at *Operations Research*.

Eckman, D. J. and S. G. Henderson. Posterior-Based Stopping Rules for Bayesian Sequential Selection Procedures. Under review at *INFORMS Journal on Computing*.

REFEREED JOURNAL PUBLICATIONS

Eckman, D. J. and S. G. Henderson. Fixed-Confidence, Fixed-Tolerance Guarantees for Selection-of-the-Best Procedures. *ACM Transactions on Modeling and Computer Simulation*. Accepted.

Eckman, D. J. and S. G. Henderson. Reusing Search Data in Ranking and Selection: What Could Possibly Go Wrong? *ACM Transactions on Modeling and Computer Simulation*. 2018. 28(3):18:1–18:15.

Eckman, D., L. Maillart, and A. Schaefer. Optimal Pinging Frequencies in the Search for an Immobile Beacon. *IIE Transactions*. 2016. 48(6):489–500. Awarded Best Applications Paper in Operations Engineering & Analytics Issue.

SUBMITTED CONFERENCE PUBLICATIONS

Eckman, D. J., M. Plumlee, and B. L. Nelson. Flat Chance! Using Stochastic Gradient Estimators to Assess Plausible Optimality for Convex Functions. S. Kim, B. Feng, K. Smith, S. Masoud, Z. Zheng, C. Szabo and M. Loper, eds. *Proceedings of the 2021 Winter Simulation Conference*, December 12–16, 2021.

CONFERENCE
PUBLICATIONS

- Eckman, D. J., M. Plumlee, and B. L. Nelson. Revisiting Subset Selection. K.-H. Bae, B. Feng, S. Kim, S. Lazarova-Molnar, Z. Zheng, T. Roeder, and R. Thiesing, eds. In: *Proceedings of the 2020 Winter Simulation Conference*, (Piscataway, New Jersey: IEEE) 2972–2983.
- Eckman, D. J. and S. G. Henderson. Biased Gradient Estimators in Simulation Optimization. K.-H. Bae, B. Feng, S. Kim, S. Lazarova-Molnar, Z. Zheng, T. Roeder, and R. Thiesing, eds. In: *Proceedings of the 2020 Winter Simulation Conference*, (Piscataway, New Jersey: IEEE) 2935–2946.
- Eckman, D. J., S. G. Henderson, and R. Pasupathy. Redesigning a Testbed of Simulation-Optimization Problems and Solvers for Experimental Comparisons. N. Mustafee, K.-H. G. Bae, S. Lazarova-Molnar, M. Rabe, C. Szabo, P. Haas, and Y.-J. Son, eds. In: *Proceedings of the 2019 Winter Simulation Conference*, (Piscataway, New Jersey: IEEE) 3457–3467.
- Eckman, D. J. and M. B. Feng. Green Simulation Optimization Using Likelihood Ratio Estimators. M. Rabe, A. A. Juan, N. Mustafee, A. Skoogh, S. Jain, and B. Johansson, eds. In: *Proceedings of the 2018 Winter Simulation Conference*, (Piscataway, New Jersey: IEEE) 2049–2060. Awarded Best Student Paper by INFORMS Simulation Society.
- Eckman, D. J. and S. G. Henderson. Guarantees on the Probability of Good Selection. M. Rabe, A. A. Juan, N. Mustafee, A. Skoogh, S. Jain, and B. Johansson, eds. In: *Proceedings of the 2018 Winter Simulation Conference*, (Piscataway, New Jersey: IEEE) 351–365.
- Dong, N., D. J. Eckman, X. Zhao, M. Poloczek, and S. G. Henderson. Empirically Comparing the Finite-Time Performance of Simulation-Optimization Algorithms. W. K. V. Chan, A. D’Ambrogio, G. Zacharewicz, N. Mustafee, G. Wainer, and E. Page, eds. In: *Proceedings of the 2017 Winter Simulation Conference*, (Piscataway, New Jersey: IEEE) 2206–2217.
- Bountourelis, T., D. Eckman, L. Luangkesorn, A. Schaefer, S. G. Nabors, and G. Clermont. Sensitivity Analysis of an ICU Simulation Model. C. Laroque, J. Himmelspach, R. Pasupathy, O. Rose, and A. M. Uhrmacher, eds. In: *Proceedings of the 2012 Winter Simulation Conference*, (Piscataway, New Jersey: IEEE) 931–942.

CONFERENCE
TALKS

- Screening Simulated Solutions Using Stochastic Gradient Estimators. In: *2021 CORS Annual Conference*, June 7–10, 2021.
- Revisiting Subset Selection. In: *2020 Winter Simulation Conference*, December 14–18, 2020.
- Using Functional Properties to Screen Out Simulated Solutions in Large Decision Spaces. In: *2020 INFORMS Annual Meeting*, November 8–13, 2020.
- Redesigning a Testbed of Simulation-Optimization Problems and Solvers for Experimental Comparisons. In: *2019 Winter Simulation Conference*, December 8–11, 2019.
- Posterior-Based Stopping Rules for Bayesian Ranking-and-Selection Procedures. In: *2019 INFORMS Annual Meeting*, October 20–23, 2019.
- Green Simulation Optimization Using Likelihood Ratio Estimators. In: *2018 Winter Simulation Conference*, December 9–12, 2018.
- Guarantees on the Probability of Good Selection. In: *2018 Winter Simulation Conference*, December 9–12, 2018.
- Comparing Frequentist and Bayesian Fixed-Confidence Guarantees for Selection-of-the-Best Problems. In: *2018 INFORMS Annual Meeting*, November 4–7, 2018.
- Empirically Comparing the Finite-Time Performance of Simulation-Optimization Algorithms. In: *2017 Winter Simulation Conference*, December 3–6, 2017.

	Probably Approximately Correct (PAC) Selection in Simulation/Best-Arm Problems. In: <i>2017 INFORMS Annual Meeting</i> , October 22–25, 2017.
	Challenges in Applying Ranking and Selection after Search. In: <i>2016 INFORMS Annual Meeting</i> , November 13–16, 2016.
CONFERENCE POSTERS	Green Simulation Optimization Using Likelihood Ratio Estimators. In: <i>2018 Winter Simulation Conference</i> , December 9–12, 2018.
	Comparing Frequentist and Bayesian Fixed-Confidence Guarantees for Selection-of-the-Best Problems. In: <i>2018 Day of Statistics at Cornell University</i> , September 7, 2018.
	Challenges in Applying Ranking and Selection after Search. In: <i>2016 Winter Simulation Conference</i> , December 11–14, 2016.
TEACHING EXPERIENCE	Northwestern University <i>Instructor</i> <ul style="list-style-type: none"> • IEMS 201: Introduction to Statistics Fall 2020 Cornell University <i>Instructor</i> <ul style="list-style-type: none"> • ORIE 5582: Monte Carlo Methods for Financial Engineering Spring 2018, 2019 • ENGRD 2700: Basic Engineering Probability & Statistics Summer 2017 <i>Teaching Assistant</i> <ul style="list-style-type: none"> • ORIE 4580/5580/5581: Simulation Modeling and Analysis Fall 2017 University of Pittsburgh <i>Teaching Assistant</i> <ul style="list-style-type: none"> • IE 1082: Probabilistic Methods in Operations Research Spring 2013, 2014 • IE 1083: Simulation Modeling with Arena Fall 2012
PROFESSIONAL SERVICE	Referee Service: <ul style="list-style-type: none"> • <i>ACM Transactions on Modeling and Computer Simulation</i> • <i>European Journal of Operational Research</i> • <i>IISE Transactions</i> • <i>INFORMS Journal on Computing</i> • <i>Management Science</i> • <i>Naval Research Logistics</i> • <i>Operations Research</i> • <i>Statistical Analysis and Data Mining</i> • <i>Proceedings of the Winter Simulation Conference</i> Co-developer of SimOpt Testbed (https://github.com/simopt-admin/simopt/wiki)
PROFESSIONAL MEMBERSHIPS	Institute for Operations Research and Management Science (INFORMS), 2016–present Association for Computing Machinery (ACM), 2019–present Society for Industrial and Applied Mathematics (SIAM), 2012–2019
AWARDS	Cornell University, <ul style="list-style-type: none"> • Graduate-Voted Teaching Assistant of the Year, 2018 National Science Foundation <ul style="list-style-type: none"> • Graduate Research Fellowship Program (GRFP) Fellowship, 2015

Barry M. Goldwater Foundation

- Goldwater Scholar, 2013

University of Pittsburgh

- Outstanding Senior Award, 2013
- Co-op Student of the Year Finalist, 2013
- Allias/Holzman Fellowship, 2012–2013