

David Rea, Ph.D.

Curriculum Vitae

Updated January 10, 2023

dar421@lehigh.edu · <https://davidjrea.github.io>

ACADEMIC APPOINTMENTS

2021

Lehigh University

Assistant Professor, Dept. of Decision and Technology Analytics,
College of Business (Primary Appointment)

College of Health (Affiliated Faculty)

EDUCATION

2021

Ph.D., Business Administration, University of Cincinnati

Dept: Operations, Business Analytics, & Information Systems

Recipient of Lindner College of Business Outstanding Doctoral Student Research Award

2015

MS, Mathematical Sciences, Clemson University

Dept: Mathematical Sciences

2012

BA, Mathematics, Economics, Wittenberg University

Dept: Mathematics, Economics

RESEARCH AREA

My research focuses on translating data into decisions, including research questions on

- (1) the fair allocation of scarce resources
- (2) capacity allocation under uncertain customer demand.

Motivated by organizational partnerships, I have primarily focused on problems in health-care and social welfare service systems.

PUBLICATIONS & WORKING PAPERS

Published

Rea, David, Craig Froehle, Suzanne Masterson, Brian Stettler, Greg Fermann, Arthur Pancioli, "Unequal but Fair: Incorporating Distributive Justice in Operational Allocation Models," *Production and Operations Management*, 30(7), 2304-2320.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/poms.13369>

Dixon, Mike, **David Rea**, Liana Victorino, Craig Froehle, "Perceived Justice and Fairness in Managing Waiting Lines," *Research Handbook on Services Management*, edited by Mark Davis, Edward Elgar Publishing, 2022, pp. 117-128.

<https://www.e-elgar.com/shop/usd/research-handbook-on-services-management-9781800375642.html>

<https://doi.org/10.4337/9781800375659.00016>

Manuscripts in Preparation & Under Review

Lane, Bennett, **David Rea**, Adam Gottula, Andrew Cathers, Ryan Ziegler, Andrew Latimer, Kyle Danielson, Brent Theiling, Craig Froehle, William Hinckley, "Association of geographic distance and hospital characteristics with use of interhospital transfer by air: A multi-center retrospective study", *Under Review at American Journal of Emergency Medicine*

Rea, David, Leonardo Lozano, Craig Froehle, "Equality and Equity: Fairness Functions for Allocation Algorithms"

Rea, David, "Arrival Forecasting During Demand Surges: A Multi-Site Study of Emergency Departments,"

Mike Lyons, **Rea, David**, Parastu Kasaie, Mike Ward, Rachel Ancova, David Kelton, "The Opportunity Costs of HIV Screening in the Emergency Department"

Ye, Han, **David Rea**, Raymond Fan, David Peng, "Profit Seeking in Interhospital Transfer Decisions", target: POMS Special Issue on Responsible Data Science

Ongoing Research

Saif Mir, **David Rea**, Zach Zacharia, "Impact of contextual factors on allocation of scarce supplies"

ACADEMIC SPEAKING

[Click or copy-paste the blue links below for recordings of available presentations](#)

Conference Presentations

- 2022
● Mir, Saif, **David Rea**, Zach Zacharia, "Impact of contextual factors on allocation of scarce supplies", DSI 2022 Annual Meeting, Houston, TX November 19th-21st
- 2022
● **Rea, David**, Leonardo Lozano, Craig Froehle, "The Equity-Equality Tradeoff in Multi-Stakeholder Routing Problems", POMS Annual Meeting, Virtual April 21st - 25th
- 2021
● **Rea, David** "Can You Automate 'Fair'," Center for Supply Chain Research at Lehigh Fall Forum, Lehigh University, Bethlehem, PA, November 5th
https://youtu.be/-126gg_9bv4
- 2021
● **Rea, David**, Leonardo Lozano, Craig Froehle, "Fair Allocation Decisions in Multi-stakeholder Healthcare Scenarios", INFORMS Annual meeting (Virtual), October 27th
<https://youtu.be/EFEhG7Ca6AA>
- 2020
● **Rea, David**, Leonardo Lozano, Craig Froehle, "Designing Fair Allocation Algorithms for Healthcare Gig Work," Decision Sciences Institute Annual Meeting (Virtual), November 23rd
<https://davidjrea.github.io/DSI2020-AlgorithmicJustice.html>

2020	<hr style="width: 100%; border: 0.5px solid black; margin-bottom: 5px;"/> <p>Rea, David, Craig Froehle, Suzanne Masterson, Brian Stettler, Greg Fermann, Arthur Pancioli, "Unequal but Fair: Incorporating Distributive Justice in Operational Allocation Models," Decision Sciences Institute Annual Meeting (Virtual), <i>Doctoral Research Showcase: Social and Healthcare Issues</i>, November 22nd https://davidjrea.github.io/DSI2020-UnequalButFair.html</p>
2020	<hr style="width: 100%; border: 0.5px solid black; margin-bottom: 5px;"/> <p>Rea, David, Craig Froehle, "Adapting Emergency Department Operations in Real-Time," INFORMS Annual Meeting (Virtual), November 8th https://davidjrea.github.io/INFORMS2020Talk.html</p>
2019	<hr style="width: 100%; border: 0.5px solid black; margin-bottom: 5px;"/> <p>Rea, David, Craig Froehle, "Accommodating Demand Surges via Proactive Staff-Planning in the Emergency Department," INFORMS Annual Meeting, Seattle, WA, October 20th.</p>
2019	<hr style="width: 100%; border: 0.5px solid black; margin-bottom: 5px;"/> <p>Green, Brittany, David Rea, "Coping with the Business Cycle as a Non-profit Organization", INFORMS Annual Meeting, Poster Session, Seattle, WA, October 22nd.</p>
2019	<hr style="width: 100%; border: 0.5px solid black; margin-bottom: 5px;"/> <p>Rea, David, Craig Froehle, Suzanne Masterson, Brian Stettler, Arthur Pancioli, "A Novel Approach to Fair Allocation of Physician Clinical Time Across Multiple Locations," Society for Academic Emergency Medicine, Poster Session, Las Vegas, NV, May 16th.</p>
2019	<hr style="width: 100%; border: 0.5px solid black; margin-bottom: 5px;"/> <p>Rea, David, Craig Froehle, Yichen Qin, "Managing Uncertainty via Distributional Demand Forecasting," INFORMS Healthcare, Boston, MA, July 29th.</p>
2019	<hr style="width: 100%; border: 0.5px solid black; margin-bottom: 5px;"/> <p>Rea, David, Craig Froehle, Suzanne Masterson, Brian Stettler, Greg Fermann, Arthur Pancioli, "Optimizing Fairness in a Multi-Site Emergency Department Staff Allocation Model," INFORMS Healthcare, Boston, MA, July 27th.</p>
2019	<hr style="width: 100%; border: 0.5px solid black; margin-bottom: 5px;"/> <p>Rea, David, Craig Froehle, Suzanne Masterson, Brian Stettler, Greg Fermann, Arthur Pancioli, "Ensuring Fairness in Physician Time Allocation: A Multi-Objective Optimization Approach," POMS Annual Meeting, Washington, DC, May 4th.</p>
2019	<hr style="width: 100%; border: 0.5px solid black; margin-bottom: 5px;"/> <p>Rea, David, Craig Froehle "Probabilistic Forecasting for Online Staffing Decisions in the Emergency Department," POMS Annual Meeting, Washington, DC, May 4th.</p>
2018	<hr style="width: 100%; border: 0.5px solid black; margin-bottom: 5px;"/> <p>Rea, David, Amir Babar, Craig Froehle "Allocating Clinical Capacity to Maximize Staff Satisfaction," POMS Annual Meeting, Houston, TX, May 4th.</p>
2017	<hr style="width: 100%; border: 0.5px solid black; margin-bottom: 5px;"/> <p>Rea, David, Craig Froehle "Improving Patient Transport Services through Crew Flexibility," INFORMS Annual Meeting, Houston, TX, October 22nd.</p>
2017	<hr style="width: 100%; border: 0.5px solid black; margin-bottom: 5px;"/> <p>Rea, David, Craig Froehle, Elizabeth Powell "Optimal Staffing, Scheduling and Dispatch Policies for Emergency Transport Services" POMS Annual Meeting, Seattle, WA, May 7th.</p>

Media & Other Speaking Engagements

2022	Magazine Article, "Healthcare, Food and Fairness" Lehigh Business Magazine, Issue No. 8, Fall 2022, Bethlehem, PA https://business.lehigh.edu/news/lehigh-business-magazine/issue-no-8-fall-2022/health-care-food-and-fairness
2021	Podcast, "Healthcare, Food and Fairness" ilLUMinate Podcast, Lehigh University Business Blog Bethlehem, PA December 1st. https://business.lehigh.edu/blog/2021/david-rea-health-care-food-and-fairness
2020	Presentation, "Who's Still Showing Up? Changes in Emergency Department Patient Population During the COVID-19 Pandemic," Emergency Medicine Research Interest Group, University of Cincinnati Cincinnati, OH, July 9th.
2019	Presentation, "Balancing Equity and Equality in the Allocation of Physician Clinical Time Across Multiple Emergency Department Facilities," Emergency Medicine Research Interest Group, University of Cincinnati Cincinnati, OH, May 8th.
2018	Panelist, "What to do with a degree in math?", Wittenberg University Springfield, OH, October 5th.
2018	Presentation, "Preliminary Results for Physician Clinical Hour Allocation Model," University of Cincinnati Emergency Medicine Research Interest Group, Cincinnati, OH, May 2nd.
2018	Presentation, "Balancing Equity and Equality in Time Allocation," Emergency Medicine Research Interest Group, University of Cincinnati Cincinnati, OH, April 10th.
2018	Poster, "Allocating Clinical Capacity Across Multiple Hospital Locations to Maximize Staff Satisfaction," Graduate Student Poster Expo, University of Cincinnati Cincinnati, OH, February 15th.
2017	Presentation, "Healthcare Analytics: Saving Lives and Lowering Costs," Departmental Colloquium Series, Wittenberg University Springfield, OH, April 3rd.
2017	Presentation, "Preliminary Results for University of Cincinnati Health Patient Transport System," Emergency Medicine Research Interest Group, University of Cincinnati Cincinnati, OH, May 3rd.
2017	Presentation, "University of Cincinnati Health Patient Transport System Simulation," Emergency Medicine Research Interest Group, Cincinnati, OH, University of Cincinnati March 8th.
2015	Masters Thesis Defense, "Can a CUSP Catastrophe Model Describe the US Economy?," Department of Mathematics Clemson University Clemson, SC, April 23rd.
2014	Presentation, "Dictionary Learning via Alternating Projection," Zentrum für Technomathematik Universität Bremen, Bremen, Germany, July 7th.

- 2012
● "The Effect of Climate Change and Climate Change Policy on Ohio's Economy," Wittenberg University Honors Thesis Defense, Springfield, OH, April 21st.
- 2010
● "Tracking Student Improvement for On-the-Rise," Center for Civic and Urban Engagement Internship Presentation, Springfield, OH, August.

RESEARCH APPOINTMENTS

- 2016
2021 Doctoral Researcher, Departments of Emergency Medicine & Operations, Business Analytics, and Information Systems, University of Cincinnati, Chairs: Arthur Pancioli, MD & Craig Froehle, PhD
- 2016
● Consultant, GE Aviation, "Optimal Inventory Segmentation and Fixed Day Supply," Supervisor: Uday Rao, PhD
- 2015
● Research Assistant, Operations, Business Analytics, and Information Systems, University of Cincinnati, "Identifying the Structure of the Bitcoin Community on Twitter Using a Stochastic Block Model," Supervisors: Yichen Qin, PhD & Zhe Shan PhD
- 2014
● Research Assistant, Zentrum für Technomathematik Universität Bremen, "Dictionary Learning via Alternating Projection," Supervisor: Emily Kang, PhD

TEACHING EXPERIENCE

Lehigh University

- Instructor Supply, Cost, and Risk Management *(Fall 2021)*
- Instructor Intro to Supply Chain Operations Management *(Spring 2022 (×2))*
(Fall 2022 (×2))

University of Cincinnati

- Instructor Introduction to Business Analytics *(Summer 2019)*
- Co-Instructor Services Management *(Fall 2018)*
- TA Statistical Methods *(Fall 2015)*
- TA Statistical Models *(Spring 2016)*

Clemson University

- Instructor Introduction to Mathematical Analysis *(Fall 2014, Spring 2015 (×2))*
- TA Precalculus Laboratory *(Fall 2013, Spring 2014(×2))*

Wittenberg University

- Co-Instructor Essential of Calculus *(Spring 2010, Fall 2011)*

Saint Martin DePorres High School

- Co-Instructor Algebra 1 *(2012-2013)*

Certifications

- Ohio-Non Tax Teaching Certificate

SERVICE

Professional Service

- 2023
● Secretary (elected), POMS College of Healthcare Operations
- 2022
● Ad-hoc reviewer: International Journal of Production and Operations Management, Annals of Operations Research, Health Care Management Science (×3), POMS College of Behavioral Operations Management Junior Scholar Competition
- 2022
● Session Organizer & Chair, “Designing Patient-Centric Systems (1)”, Production and Operations Management Society 2022 Annual Conference
- 2022
● Session Organizer & Chair, “Designing Patient-Centric Systems (2)”, Production and Operations Management Society 2022 Annual Conference
- 2022
● Session Organizer & Chair, “Designing Fair Service Systems (1)”, Production and Operations Management Society 2022 Annual Conference
- 2022
● Session Organizer & Chair, “Designing Fair Service Systems (2)”, Production and Operations Management Society 2022 Annual Conference
- 2020
● Conference Paper Reviewer, Decision Sciences Institute 2020 Annual Meeting (Virtual)
- 2020
● Organizer, OBAIS PhD Student Research Seminar, University of Cincinnati, Lindner College of Business
- 2019
● Session Organizer & Chair, “Managing Uncertain Patient Demand,” INFORMS Healthcare, Boston, MA, July 29th.
- 2019
● Session Organizer & Chair, “Implementing Data Driven Technology,” INFORMS Healthcare, Boston, MA, July 27th.
- 2019
● Session Organizer & Chair, “Human-Centric Healthcare Operations,” POMS Annual Meeting, Washington, DC, May 4th.
- 2019
● Session Organizer & Chair, “Data-Driven Decision-Making,” POMS Annual Meeting, Washington, DC, May 4th.
- 2019
● Mentor, “Grad-Undergrad Research Connections Program” University of Cincinnati, Cincinnati, OH,

Institutional Service

- 2022
● Lehigh New Faculty Orientation, *Faculty Panel Member*
- 2022
● Lehigh College of Health Strategy Conference, *Invited External Faculty*
- 2022
● Lehigh Accounting Faculty Search Committee, *External Member*

- 2021 Lehigh DATA Department Faculty Search, *Departmental Member*
- 2021 Lehigh AACSB Reaccreditation, *Untenured Faculty Panel*
- 2021 Lehigh Center for Supply Chain Research, *Faculty Support Member*

HONORS & MEMBERSHIPS

- 2019 Manufacturing & Service Operations Management
- 2019 Decision Science Institute
- 2017 Institute for Operations Research and the Management Sciences
- 2017 Production and Operations Management Society
- 2013-2021 Society for Industrial and Applied Mathematics

- 2022 Bert Trucksess Foundation Research Grant (\$5k), Lehigh University
- 2021 Lindner College of Business Outstanding Doctoral Student Research Award, University of Cincinnati
- 2016 Omega Rho, University of Cincinnati
- 2012 Mortar Board, Wittenberg University
- 2012 Phi Beta Kappa, Wittenberg University
- 2012 Departmental Honors in Economics, Wittenberg University
- 2012 University Honors, Wittenberg University
- 2012 Phi Eta Sigma, Wittenberg University

WORK EXPERIENCE

- 2012-2013 Apprentice Teacher, Saint Martin DePorres High School, Cleveland, OH
- 2010 Strengthening After Schools Program Summer Intern, Center for Civic and Urban Engagement, Springfield, OH

2009

- — Freedom School Servant Leader Intern, Children's Defense Fund, Cleveland, OH

SOFTWARE SKILLS

R, ARENA, STAN, Latex, Excel, Open Solver, Matlab, Python, GAMS, Minitab, AnyLogic, SAS