

# David Rea

## Curriculum Vitae

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3493 Brookline Ave., Apt 3, Cincinnati, OH 45220

### EDUCATION

2021

PhD, Business Administration, University of Cincinnati  
Dept: Operations, Business Analytics, & Information Systems  
Expected Graduation: May 2021

2015

MS, Mathematical Sciences, Clemson University  
Dept: Mathematical Sciences

2012

BA, Mathematics, Economics, Wittenberg University  
Dept: Mathematics, Economics

### RESEARCH AREA

In my research, I study human-induced stochasticity in service systems. I develop data-driven interventions which mitigate the resulting stress on systems. Specifically, my focus has been placed on two broad issues in service systems:

- (1) Fair task allocation under variable individual needs and preferences
- (2) Real-time analytics for accommodating uncertain customer demand.

My active research falls under two primary contexts: *healthcare operations* and *food distribution networks*. The contributions to societal good motivate my interest in these topics.

### PUBLICATIONS & WORKING PAPERS

#### Manuscripts Under Review

**Rea, David**, Craig Froehle, Suzanne Masterson, Brian Stettler, Greg Fermann, Arthur Pancioli, "When Equal Isn't Fair: A Case Study of Service Employee Staffing," *3rd Round Review at Production and Operations Management*.

**Rea, David**, Craig Froehle, "Algorithmic Justice: Principled Compromises in Fair Decision Models," *Submitted to Management Science*

#### Manuscripts in Preparation

**Rea, David**, Craig Froehle, "Real-time Analytics for On-demand Services: A Literature Review and Framework," *Target: Production and Operations Management*.

Dixon, Mike, **David Rea**, Liana Victorino, Craig Froehle, "Perceived Justice and Fairness in Managing Waiting Lines," Book Chapter, *Research Handbook on Services Management*

#### Ongoing Research

**Rea, David**, Craig Froehle, "Before They Wait: Forecasting and Accommodating Demand Uncertainty in the Emergency Department," *Dissertation Research*

Green, Brittany, **David Rea**, Charles Hoffman, Craig Froehle, Andrew Beck, Carely Riley, "Estimating the Hunger Gap", *Hamilton County Food Distribution Working Group*

**Rea, David**, Brittany Green, Charles Hoffman, Craig Froehle, Andrew Beck, Carely Riley, "Injection and Redistribution: Coordinating Efforts to Close the Hunger Gap in Hamilton County", *Hamilton County Food Distribution Working Group*

**Rea, David**, Rachel Ancova, Chet Zalesky, Curry Woods, Bob Doerning, Caroline Freiermuth, "Where are the overdoses? The effect of COVID-19 on Opioid Presentations in the ED"

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

## ACADEMIC SPEAKING

### Invited Talks & Panels

- 2020  
● "Designing Fair Allocation Algorithms for Healthcare Gig Work," Decision Sciences Institute Annual Meeting (Virtual), November.
- 2020  
● "Adapting Emergency Department Operations In Real-Time," INFORMS Annual Meeting (Virtual), November.
- 2019  
● "Accommodation of Demand Surges in the Emergency Department via Proactive Staff-Planning," INFORMS Annual Meeting, Seattle, WA, October.
- 2019  
● "Coping with the Business Cycle as a Non-profit Organization" INFORMS Annual Meeting, Poster Session, Seattle, WA, October.
- 2019  
● "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.
- 2019  
● "Managing Uncertainty via Distributional Demand Forecasting," INFORMS Healthcare, Boston, MA, July 29th.
- 2019  
● "Optimizing Fairness in a Multi-Site Emergency Department Staff Allocation Model," INFORMS Healthcare, Boston, MA, July 27th.
- 2019  
● "Ensuring Fairness in Physician Time Allocation: A Multi-Objective Optimization Approach," POMS Annual Meeting, Washington, DC, May 4th.
- 2019  
● "Probabilistic Forecasting for Online Staffing Decisions in the Emergency Department," POMS Annual Meeting, Washington, DC, May 4th.
- 2018  
● Panelist, "What to do with a Degree in Math?", Wittenberg University Springfield, OH, October 5th.
- 2018  
● "Allocating Clinical Capacity to Maximize Staff Satisfaction," POMS Annual Meeting, Houston, TX, May 4th.
- 2017  
● "Improving Patient Transport Services through Crew Flexibility," INFORMS Annual Meeting, Houston, TX, November October 22nd.
- 2017  
● "Optimal Staffing, Scheduling and Dispatch Policies for Emergency Transport Services" POMS Annual Meeting, Seattle, WA, May 7th.

2017	Presentation, "Health-care Analytics: Saving Lives and Lowering Costs," Departmental Colloquium Series, Wittenberg University Springfield, OH, April 3rd.
<b>Other Speaking Engagements</b>	
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	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, "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-Present	Doctoral Researcher, Departments of Emergency Medicine & Operations, Business Analytics, and Information Systems, University of Cincinnati, Chairs: Arthur Pancioli, MD & Craig Froehle, PhD
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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

### University of Cincinnati

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

### Clemson University

Instructor	Introduction to Mathematical Analysis	<i>(Fall 2014, Spring 2015)</i>
TA	Precalculus Laboratory	<i>(Fall 2013, Spring 2014)</i>

### Wittenberg University

Co-Instructor	Essential of Calculus	<i>(Spring 2010, Fall 2011)</i>
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### Saint Martin DePorres High School

Co-Instructor	Algebra 1	<i>(2012-2013)</i>
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### Certifications

Ohio-Non Tax Teaching Certificate

## 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

## PROFESSIONAL SERVICE

2020	Conference Paper Reviewer, Decision Sciences Institute Annual Meeting
2020	Organizer, OBAIS PhD Student Research Seminar, University of Cincinnati, Lindner College of Business

2019	Session Chair, "Managing Uncertain Patient Demand," INFORMS Healthcare, Boston, MA, July 29th.
2019	Session Chair, "Implementing Data Driven Technology," INFORMS Healthcare, Boston, MA, July 27th.
2019	Session Chair, "Human-Centric Healthcare Operations," POMS Annual Meeting, Washington, DC, May 4th.
2019	Session Chair, "Data-Driven Decision-Making," POMS Annual Meeting, Washington, DC, May 4th.
2019	Mentor, "Grad-Undergrad Research Connections Program" University of Cincinnati, Cincinnati, OH,

## **HONORS & MEMBERSHIPS**

Since 2019	<b>Professional Societies</b>
	Manufacturing and Service Operations Management
Since 2019	Decision Science Institute
Since 2017	Institute for Operations Research and the Management Sciences
Since 2017	Production and Operations Management Society
Since 2013	Society for Industrial and Applied Mathematics

	<b>Awards and Honors Societies</b>
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

## **SOFTWARE SKILLS**

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