

# 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 develop policies aimed at improving the human condition inside service systems that provide basic needs, primarily in healthcare and humanitarian contexts. Driven by data and enabled by community partnerships, I use a blend of predictive and prescriptive analytics to study operational problems in:

- (1) The fair allocation of resources under variable individual needs and preferences
- (2) Capacity allocation under uncertain customer demand

### PUBLICATIONS & WORKING PAPERS

#### Manuscripts Under Review

**Rea, David**, Craig Froehle, Suzanne Masterson, Brian Stettler, Greg Fermann, Arthur Pancioli, "Unequal but Fair: Incorporating Distributive Justice in Operational Allocation Models," *3rd Round Review at Production and Operations Management*.

**Rea, David**, Leonardo Lozano, Craig Froehle, "Algorithmic Justice: Fair Compensation through Principled Compromises," *Under Review at Management Science*

#### Manuscripts in Preparation

Green, Brittany, **David Rea**, Charles Hoffman, Chia-Chun Yang, Craig Froehle, Andrew Beck, Carely Riley, "Localized Forecasts of the Childhood Meal Gap", *Target: JAIS Special Issue on Data Science for Social Good*

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

Dixon, Mike, **David Rea**, Liana Victorino, Craig Froehle, "Perceived Justice and Fairness in Managing Waiting Lines," Book Chapter, Set to be published in *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*

**Rea, David**, Brittany Green, Charles Hoffman, Craig Froehle, Andrew Beck, Carely Riley,: "Injection and Redistribution: Coordinating Efforts to Close the Hunger Gap", *All Children Thrive Food Insecurity 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"

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

## ACADEMIC SPEAKING

### Upcoming Conference Presentations

- 2020  
"Designing Fair Allocation Algorithms for Healthcare Gig Work," Decision Sciences Institute Annual Meeting (Virtual), Session HM15  
**November 23rd 9:00am PST**
- 2020  
"Unequal but Fair: Incorporating Distributive Justice in Operational Allocation Models," Decision Sciences Institute Annual Meeting (Virtual), *Doctoral Research Showcase: Social and Healthcare Issues*, Session DRS5  
**November 22nd 3:00pm PST**
- 2020  
"Adapting Emergency Department Operations in Real-Time," INFORMS Annual Meeting (Virtual), Session SA09  
**November 8th 1:15pm EST,**

### Invited Talks & Panels

- 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.

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| 2017                              | "Improving Patient Transport Services through Crew Flexibility," IN-FORMS 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

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|--------------|--|
| 2016-Present | 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

### 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) |
| TA         | Precalculus Laboratory                | (Fall 2013, Spring 2014) |

### Wittenberg University

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

### Saint Martin DePorres High School

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

### Certifications

Ohio-Non Tax Teaching Certificate

## WORK EXPERIENCE

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|-----------|---|
| 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 |
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| 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**

|                               |   |
|-------------------------------|---|
| <b>Professional Societies</b> |   |
| Since 2019                    | 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                |

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| <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