

# Özge Sürer

Northwestern University  
Department of Industrial Engineering and Management Sciences  
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## RESEARCH INTERESTS

Methodology: Statistical and Machine Learning, Computational Statistics, Predictive Models, Data Analytics  
Applications: Recommender Systems, Public Health, Physical-Statistical Modeling

## EDUCATION

### Northwestern University

*Ph.D. in Industrial Engineering and Management Sciences*

Advisors: Professors Daniel W. Apley, Edward C. Malthouse

Thesis: Predictive Models for Group-Structured Regression and Classification Problems

Major in *Applied Statistics & Statistical Learning*; Minors in *Analytics* and *Optimization*

Evanston, IL  
December 2020

### Boğaziçi University

*M.S. in Industrial Engineering*

Advisor: Professor İ. Kuban Altinel

Thesis: Event and Clock-Based Representations of Time in Mathematical Optimization

İstanbul, Turkey  
January 2014

### İstanbul Technical University

*B.S. in Industrial Engineering*

İstanbul, Turkey  
June 2011

## ACADEMIC & PROFESSIONAL EXPERIENCE

### Northwestern Argonne Institute of Science and Engineering

*Postdoctoral Research Fellow*

Supervisors: Matthew Plumlee, Stefan Wild

Topics: Bayesian statistical methodology and its applications in machine learning including Gaussian processes, tree models, and dimension reduction, computational statistical inference including multi-model emulators, uncertainty quantification for parameters, model calibrators, and model mixing

Evanston, IL  
January 2021 – Present

### United Airlines

*Statistics and Operations Research Intern*

Topics: Spill & recapture model for predicting the future demand, benchmark studies through data analysis

techniques and visualization, decomposition methods to more accurately and efficiently model spill and recapture

Chicago, IL  
June 2019 – September 2019

### Northwestern University

*Research Fellow, Spiegel Digital & Database Research Center*

Topics: Recommender systems in multisided platforms, data analytics

Evanston, IL  
September 2016 – September 2020

## TEACHING EXPERIENCE

### Northwestern University

*Instructor, Industrial Engineering and Management Sciences Department*

- IEMS 303 Statistics (Undergraduate level)

Class size: 29, Instructor overall effectiveness: 5.35/6.00

Topics: Foundations of statistics and statistical computing for data analysis, descriptive statistics and statistical inference

Teaching project: Implemented a project titled “Confidence in Learning Statistics with R Programming Language” as a participant of the Searle Center Teaching-As-Research program

*Teaching Assistant, Industrial Engineering and Management Sciences Department*

- IEMS 202 Probability (Undergraduate level)
- IEMS 303 Statistics (Undergraduate level)

Winter 2017, Spring 2018

Fall 2016/2018, Winter 2019, Spring 2020

*Teaching Assistant, Master of Science in Analytics*

- MSIA 421 Data Mining

Winter 2018

*Bootcamp Instructor, Industrial Engineering and Management Sciences Department*

- Statistics (Ph.D. level)

Fall 2016

- [1] **Özge Sürer**, Daniel W. Apley, Edward C. Malthouse. Coefficient tree regression: Fast, accurate and interpretable predictive modeling. *Machine Learning* (accepted), 2021.<sup>1</sup>
- [2] **Özge Sürer**, Daniel W. Apley, Edward C. Malthouse. Coefficient tree regression for generalized linear models. *Statistical Analysis and Data Mining: The ASA Data Science Journal*, 14, 407–429, 2021. ([link](#))
- [3] Haoxiang Yang, **Özge Sürer**, Daniel Duque, David P. Morton, Bismark Singh, Spencer Fox, Remy Pasco, Kelly Pierce, Paul Rathouz, Zhanwei Du, Michael Pignone, Mark E. Escott, Stephen I. Adler, S. Clairborne Johnston, Lauren Ancel Meyers. Design of COVID-19 staged alert systems to ensure healthcare capacity with minimal closures. *Nature Communications*, 12, 3767, 2021. ([link](#))
- [4] Seda Yanik, **Özge Sürer**, Başar Öztayşi. Designing sustainable energy regions using genetic algorithms and location-allocation approach. *Energy*, 161–172, 2016. ([link](#))

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PEER-REVIEWED CONFERENCE PROCEEDINGS

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- [5] **Özge Sürer**, Matthew Plumlee. Calibration using emulation of filtered simulation results. *Winter Simulation Conference* (accepted), 2021.<sup>1</sup>
- [6] **Özge Sürer**, Robin Burke, Edward C. Malthouse. Multistakeholder recommendation with provider constraints. *Proceedings of the 12th ACM Conference on Recommender Systems*, 54–62, 2018. ([link](#))
- [7] **Özge Sürer**. Improving similarity measures using ontological data. *Proceedings of the 11th ACM Conference on Recommender Systems*, 416–420, 2017. ([link](#))

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UNDER REVIEW & IN PREPARATION

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- [8] Paul J. Rathouz, Victoria Valencia, Patrick Chang, David P. Morton, Haoxiang Yang, **Özge Sürer**, Spencer J. Fox, Elizabeth C. Matsui, Alex B. Haynes, Lauren A. Meyers. Survival analysis methods for analysis of hospitalization data: Application to COVID-19 patient hospitalization experience. Under revision. ([link](#))
- [9] **Özge Sürer**, Daniel W. Apley, Edward C. Malthouse. Discovering structure in longitudinal data. In preparation.<sup>1</sup>

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TECHNICAL REPORTS

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- [1] Nazlican Arslan, **Özge Sürer**, David P. Morton, Haoxiang Yang, Michael Lachmann, Spencer Woody, Spencer J. Fox, Lauren Ancel Meyers. COVID-19 alert stages, healthcare projections and mortality patterns in Austin, Texas. Technical Report, 2021. ([link](#))
- [2] Haoxiang Yang, Michael Lachmann, **Özge Sürer**, Spencer J. Fox, David P. Morton, Lauren Ancel Meyers. Projecting need for a COVID-19 alternate care site (ACS) in Austin. Technical Report, 2021. ([link](#))
- [3] Haoxiang Yang, Daniel Duque, **Özge Sürer**, David P. Morton, Remy Pasco, Kelly Pierce, Spencer Fox, Lauren Ancel Meyers. Staged strategy to avoid hospital surge and preventable mortality, while reducing the economic burden of social distancing measures. Technical Report, 2020. ([link](#))

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BOOK CHAPTERS

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- [1] **Özge Sürer**, Sezi Çevik Onar, İlker Topçu. Innovation strategy evaluation process using fuzzy cognitive mapping. *Intelligent Techniques in Engineering Management*, 107–128, 2015. ([link](#))
- [2] Başar Öztayşi, **Özge Sürer**. Supply chain performance measurement using a SCOR based fuzzy VIKOR approach. *Supply Chain Management Under Fuzziness*, 199–224, 2014. ([link](#))

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<sup>1</sup>Available upon request.

## PRESENTATIONS & INVITED TALKS

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- [1] (*upcoming*) SIAM Conference on Uncertainty Quantification, Atlanta, GA (April, 2022). *A sequential approach to calibration of a computationally intensive model.*
- [2] (*upcoming*) SIAM Conference on Parallel Processing for Scientific Computing, Seattle, WA (February, 2022). *Calibration of a computationally intensive model with parallel computing aspects.*
- [3] (*upcoming*) Winter Simulation Conference, Phoenix, AZ (December, 2021). *Calibration using emulation of filtered simulation results.*
- [4] (*upcoming*) INFORMS Annual Meeting, Anaheim, CA (October, 2021). *Calibration using emulation of filtered simulation results.*
- [5] (*upcoming*) INFORMS Workshop on Data Mining and Decision Analytics, Anaheim, CA (October, 2021). *Discovering group structure in longitudinal data.*
- [6] INFORMS Annual Meeting, Seattle, WA (October, 2019). *Coefficient tree regression for discovering structure in generalized linear models.*
- [7] INFORMS Annual Meeting, Seattle, WA (October, 2019). *Discovering structure in longitudinal data via coefficient tree regression.*
- [8] INFORMS Annual Meeting, Phoenix, AZ (November, 2018). *Coefficient tree regression for discovering hidden structure.*
- [9] The 12th ACM Conference on Recommender Systems, Vancouver, Canada (October, 2018). *Multistakeholder recommendation with provider constraints.*
- [10] The Midwest Machine Learning Symposium, Chicago, IL (June, 2018). *Coefficient tree regression for discovering hidden structure.*
- [11] The 11th ACM Conference on Recommender Systems, Como, Italy (August, 2017). *Improving similarity measures using ontological data.*
- [12] The 34th National Conference for Operations Research and Industrial Engineering, Bursa, Turkey (June, 2014). *Event and clock-based representations in mathematical optimization.*
- [13] The 26th European Conference on Operational Research, Rome, Italy (July, 2013). *Simulated annealing algorithm with variable cluster number and comparison with k-means algorithm.*
- [14] The 25th European Conference on Operational Research, Vilnius, Lithuania (July, 2012). *A multi-criteria based evaluation of innovation strategy selection.*

## MENTORING EXPERIENCE

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### Doctoral student

*Bayesian Analysis of Nuclear Dynamics Collaboration, Summer Fellow*

- Yuriy Volkotrub June–September 2021  
*Building a statistical method for quantifying the uncertainty in a physics model*

### Undergraduate students

*Northwestern University, Industrial Engineering and Management Sciences Department*

- Justin Chen June–September 2021  
*Integration of visualization and diagnostics modules to the Python package `surmise`*
- Huangda Shang (co-supervised with D. Morton) September 2020–March 2021  
*Alternative solutions of COVID-19 staged alert systems via derivative-free optimization methods*
- Aneesh Kudaravalli, Katherine Johns, Margot Dupeyroux,  
Robert Wong, Yun Hwan Choi (co-supervised with D. Morton) September–December 2020  
*Investigation of different trigger metrics for COVID-19 staged alert systems*
- Achyut Kasi, Cindy Sanchez (co-supervised with D. Morton) June–September 2020  
*Development of a module to produce graphs and reports automatically for the COVID-19 staged alert system*

## AWARDS & HONORS

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- Walter P. Murphy Fellowship for outstanding first year Ph.D. students at Northwestern, Evanston, IL 2015–2016
- Scientific and Technological Research Council of Turkey Scholarship, Turkey 2011–2015
- Council of Higher Education Undergraduate Scholarship, Turkey 2006–2011

## SERVICE & PROFESSIONAL ACTIVITIES

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- **Organizer**, SIAM Conference on Parallel Processing for Scientific Computing, Workshop, Seattle, WA February, 2022  
(upcoming) *Statistical Methods for Uncertainty Quantification and Parallel Computing*
- **Session chair**, INFORMS Annual Meeting, Anaheim, CA October, 2021  
(upcoming) *Data-driven Modeling in Uncertainty Quantification*
- **Session chair**, INFORMS Annual Meeting, Seattle, WA October, 2019  
*Interpretable Predictive Models*
- **Session chair**, INFORMS Annual Meeting, Phoenix, AZ November, 2018  
*Intriguing Tweaks in Data Science I*
- **Participant**, INFORMS Doctoral Student Colloquium, Houston, TX October, 2017
- **Participant**, ACM Summer School on Recommender Systems, Como, Italy August, 2017
- **Organizer**, Global Conference on Engineering and Technology Management, İstanbul, Turkey June, 2014
- **Session chair**, Global Conference on Healthcare Systems Engineering, İstanbul, Turkey August, 2014  
*Health Economics*
- **Session chair**, European Conference on Operational Research, Rome, Italy July, 2013  
*Artificial Intelligence–Fuzzy Systems*

## OPEN-SOURCE SOFTWARE

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- **surmise**, v0.1.1 released July 2021 [read the docs](#), [project page](#)  
Python package designed to provide a surrogate model interface for calibration, uncertainty quantification, and sensitivity analysis.
- **CTR**, released September 2020 [vignette](#), [project page](#)  
R package for the application of coefficient tree regression (CTR).
- **COVID-19 Staged Alert System**, released May 2020 [project page](#)  
Python code for finding the best COVID-19 staged strategy.