Özge Sürer

Northwestern University, Department of Industrial Engineering and Management Sciences
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Education

Northwestern University — Evanston, IL
Ph.D. candidate in Industrial Engineering and Management Sciences — *Anticipated June 2020*
Advisors: 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*
Center for the Integration of Research, Teaching and Learning (CIRTL) Scholar — *June 2019*

Boğaziçi University — İstanbul, Turkey
M.S. in Industrial Engineering — *January 2014*
Advisor: İ. Kuban Altinel
Thesis: Event and Clock-Based Representations of Time in Mathematical Optimization

İstanbul Technical University — İstanbul, Turkey
B.S. in Industrial Engineering — *June 2011*

Research Interests

I am broadly interested in applied statistical learning and predictive models for data science. More specifically, I have been working on the design of fast, accurate, and interpretable predictive models for 1) linear regression, 2) generalized linear models, and 3) longitudinal datasets, and their interdisciplinary applications.

Professional Experience

United Airlines — Chicago, IL
Statistics and Operations Research Intern — *June 2019 – September 2019*

- Supported the spill & recapture project in benchmark studies through data analysis techniques and visualization
- Contributed to the calibration of the model to understand drivers of errors and ways to make the model more accurate and faster
- Created a tool in Python to explain the performance of forecasting models through model evaluation metrics and visual diagnostics
- Proposed a new approach for the existing column generation method to more accurately and efficiently model spill and recapture

Research Experience

Northwestern University — Evanston, IL
Graduate Research Fellow, Spiegel Digital & Database Research Center — *September 2016 – Present*

- Integrated ontological information into the similarity metrics to improve the accuracy of predictive models, and demonstrated the results with a real-world example of TV set-top-box viewing data
- Developed a new model to optimize recommender systems, and conducted a study on multi-sided platforms using the data provided by ShopRunner, a U.S.-based multi-sided platform
- Conducted an analysis of local news subscriber behaviors using years of subscriber and click-stream reading data from local media companies to understand and predict subscriber retention

Research Assistant, Industrial Engineering and Management Sciences Department — *September 2015 – Present*

- Developed new methods to discover the group structure from high-dimensional data to address various problems such as interpretability, accuracy and computational efficiency in big-data environments
- Built an R package for the new methods that can be used as a visualization tool to provide insight into the regression dependencies by implementing computational features from both linear regression and regression trees
- Achieved an order-of-magnitude decrease in computational time compared to the popular regularized regression methods
- Extended the new approach to generalized linear models to discover the group structure from the data, and derived special cases, such as logistic and Poisson regressions
- Proposed a new approach to discover the group structure when the data have a spatial and/or temporal component, as in the case of longitudinal data

Teaching Experience

Northwestern University Evanston, IL

Instructor, Industrial Engineering and Management Sciences Department *Spring 2019*

- IEMS 303 Statistics (Undergraduate level)
  - Class size: 29, Instructor overall effectiveness: 5.35/6.00
  - Sole instructor for the course, which focuses on the foundations of statistics and statistical computing for data analysis and their applications, and covers descriptive statistics and statistical inference
  - Implemented a teaching project, titled "Confidence in Learning Statistics with R Programming Language"

Teaching Assistant, Industrial Engineering and Management Sciences Department

- IEMS 202 Probability (Undergraduate level) Winter 2017, Spring 2018
- IEMS 303 Statistics (Undergraduate level) Fall 2016/2018/2019, Winter 2019/2020
- MSIA 421 Data Mining (Master of Science in Analytics) Winter 2018

Grader, Industrial Engineering and Management Sciences Department

- MEM 407 Decision Tools for Managers (Master of Engineering Management) Fall 2017, Winter 2018

Bootcamp Instructor, Industrial Engineering and Management Sciences Department

- Statistics (Ph.D. level) Fall 2016

Under Review/In Preparation

- **Özge Sürer**, Daniel W. Apley, Edward C. Malthouse. Coefficient tree regression: Fast, accurate and interpretable predictive modeling. Submitted.
- **Özge Sürer**, Daniel W. Apley, Edward C. Malthouse. Coefficient tree regression for discovering structure in generalized linear models. In preparation.
- **Özge Sürer**, Daniel W. Apley, Edward C. Malthouse. Discovering structure in longitudinal data via coefficient tree regression. In preparation.

Conference Proceedings

- **Özge Sürer**, Robin Burke, Edward C. Malthouse. Multistakeholder recommendation with provider constraints. *Proceedings of the 12th ACM Conference on Recommender Systems*, 54–62, 2018 (Acceptance rate: 18%).
- **Özge Sürer**. Improving similarity measures using ontological data. *Proceedings of the 11th ACM Conference on Recommender Systems*, 416–420, 2017 (Acceptance rate: 16.4%).

Journal Publications

- Seda Yanik, **Özge Sürer**, Başar Öztayşi. Designing sustainable energy regions using genetic algorithms and location-allocation approach. *Energy*, 161–172. 2016.

Book Chapters

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

Presentations & Invited Talks

- **Özge Sürer**, Daniel W. Apley, Edward C. Malthouse. Coefficient tree regression for discovering structure in generalized linear models. *INFORMS Annual Meeting*, Seattle, WA, 2019.
- **Özge Sürer**, Daniel W. Apley, Edward C. Malthouse. Discovering structure in longitudinal data via coefficient tree regression. *INFORMS Annual Meeting*, Seattle, WA, 2019.
- **Özge Sürer**, Daniel W. Apley, Edward C. Malthouse. Coefficient tree regression for discovering hidden structure. *INFORMS Annual Meeting*, Phoenix, AZ, 2018.
- **Özge Sürer**, Daniel W. Apley, Edward C. Malthouse. Coefficient tree regression for discovering hidden structure. *The Midwest Machine Learning Symposium*, Chicago, IL, 2018.
- **Özge Sürer**, Robin Burke, Edward C. Malthouse. Multistakeholder recommendation with provider constraints. *The 12th ACM Conference on Recommender Systems*, Vancouver, Canada, 2018.

- **Özge Sürer**. Improving similarity measures using ontological data. *The 11th ACM Recommender Systems Doctoral Symposium*, Como, Italy, 2017.
- Gökalp Erbeyoğlu, **Özge Sürer**, Evren Güney, İ. Kuban Altinel, Necati Aras, Bora Çekyay, Gönenç Yücel. Influence maximization in social networks. *The 35th National Conference for Operations Research and Industrial Engineering*, Ankara, Turkey, 2015.
- **Özge Sürer**, İ. Kuban Altinel. Event and clock-based representations in mathematical optimization. *The 34th National Conference for Operations Research and Industrial Engineering*, Bursa, Turkey, 2014.
- **Özge Sürer**. Simulated annealing algorithm with variable cluster number and comparison with k -means algorithm. *The 26th European Conference on Operational Research*, Rome, Italy, 2013.
- **Özge Sürer**, Sezi Çevik Onar, İlker Topçu. A multi-criteria based evaluation of innovation strategy selection. *The 25th European Conference on Operational Research*, Vilnius, Lithuania, 2012.

Awards & Honors

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

Service & Professional Activities

- Session chair for Interpretable Predictive Models track, INFORMS, Seattle, WA, October 20–23, 2019
- Session chair for Intriguing Tweaks in Data Science I track, INFORMS, Phoenix, AZ, November 4–7, 2018
- Participant, INFORMS Doctoral Student Colloquium, Houston, TX, October 22–25, 2017
- Participant, The ACM Summer School on Recommender Systems, Como, Italy, August 21–25, 2017
- Conference organizing committee member, Global Conference on Engineering and Technology Management, İstanbul, Turkey, June 23–26, 2014
- Session chair for Health Economics track, Global Conference on Healthcare Systems Engineering, İstanbul, Turkey, August, 5–8, 2014
- Session chair for Artificial Intelligence, Fuzzy Systems track, EURO 2013, Rome, Italy, July 1–4, 2013

Software Development

- R "CTR" package: For the application of coefficient tree regression (CTR)