Meserret Karaca

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Research Interests

Data analytics, including methodological and applied aspects, with an emphasis on developing computationally efficient algorithms particularly on the big multivariate asynchronous temporal data.

Systems monitoring, with a purpose of developing domain-free and scalable algorithms on discrete sequential processes, particularly on streaming data.

Applications of data analytics in the prediction of anomaly in smart systems and the demand of store items during disasters.

Education

2018– exp. 2022	**Doctor of Philosophy in Industrial Engineering**. University of Florida, FL Dissertation title: Pattern Mining and Anomaly Detection on Multivariate Temporal Data *Advisors:* Dr. Michelle Alvarado, Dr. Panos Pardalos
2016–2018	**Doctor of Philosophy in Operations Management(completed 42 credits)**. The University of Alabama, AL *Advisor:* Dr. Mesut Yavuz
2013–2016	**Master of Science in Industrial Engineering**. Özyeğin University, İstanbul, Turkey *Advisors:* Dr. Burcu Balçık, Dr. O. Örsan Özener
2012–2013	**Scientific Preperation in Industrial Engineering**. Özyeğin University, İstanbul, Turkey
2006–2011	**Bachelor of Science in Mathematics**. Fatih University, İstanbul, Turkey

Work Experience

June 2021 –present	**Bayer Crop Science, MO**. Position: Data Scientist Coop *Supervisor:* Shrikant Jarugumilli

Publications

Appeared and In Press Refereed Journals

- **Karaca M.**, Alvarado, M. M., Gahrooei, M. R., Bihorac, A., Pardalos, P. M. (2022). Frequent pattern mining from multivariate time series data. Expert Systems with Applications, Volume 194, https://doi.org/10.1016/j.eswa.2021.116435.
- Magee, E., **Karaca, M.**, Lawrence, A., Escoto, E., and Alvarado, M. (2019) "Machine Learning Applied to Walk-In Demand Prediction for University Counseling Center." University of Florida Journal of Undergraduate Research, 21(1): 1-11.

Submitted To Refereed Journals
- Alvarado, M., Basinger, K., Lahijanian, B., **Karaca M.**, and Alvarado, D. "An Empirical Study of Video Length Preferences for Gen-Z Engineering Students in a Flipped Classroom." (2021) Submitted to Advances in Engineering Education, in revision

Manuscripts In Preparation
- An SGT-based Method for Monitoring Discrete Sequence Processes (joint work with Chitta Ranjan, Michelle Alvarado, and Mostafa Reisi-Gahrooei)
- Data-driven Analysis of the Economic Impacts of Disasters (joint work Christa Court, Mostafa Reisi-Gahrooei, Joao Pedro Ferreira, Sungeun Yoon)

Conference Proceedings
- Alvarado, M., Basinger, K., Alvarado, D., Lahijanian, B., Buzard, B., **Karaca, M.** "Strategies for Flipped Classroom Video Development: Educating Generation Z Engineering Students." In Proceedings of the 2020 ASEE Annual Conference, Virtual Conference, June 21-25, 2020.
- Lahijanian, B., Basinger, K., **Karaca, M.**, Alvarado, D., Buzard, B., and Alvarado, M."Flipped Classroom Video Engagement for Generation Z Engineering Students." In Proceedings of the 2020 IISE Annual Conference and Expo, New Orleans, LA, Oct. 31-Nov. 3, 2020.

━━━━━ Selected Honors & Awards

- Honorable Mention in Poster Competition in QPRC, July 2021.
- NSF sponsorship for participation in QPRC, July 2021.
- ISE Graduate Student Award – Teaching, April 2021
- Researcher. "Human trafficking demand reduction strategies through network analytics and simulation modeling", Jan 2020 – May 2021, UF Foundation, Seed Grant, $10,000 (Karaca: $4,000).
- Best Teaching Assistant Award at Özyeğin University, İstanbul, Turkey, 2016
- TÜBİTAK (The Scientific & Technological Research Council of Turkey) 2205 Undergraduate Scholarship Program, 2006 – 2011

━━━━━ Presentations

1. An SGT-based Method for Monitoring Discrete Sequence Processes, INFORMS 2021 Annual Meeting
2. Poster Presentation: An SGT-based Method for Monitoring Discrete Sequence Processes, QPRC 2021
3. Poster Presentation: An SGT-based Method for Monitoring Discrete Sequence Processes, IISE 2021 Annual Conference
4. Frequent Pattern Mining from Multivariate Time Series Data, INFORMS 2020 Annual Meeting
5. Advance Technology Usage to Combat Labor Trafficking in Florida, International Human Trafficking and Social Justice Conference, 2020
6. Frequent Pattern Mining from Multivariate Time Series Data, INFORMS 2019 Annual Meeting, Seattle, WA
7. Frequent Pattern Mining from Multivariate Time Series Data, INFORMS Healthcare 2019, MIT Sloan School of Management, Cambridge, MA
8. Frequent Pattern Mining from Multivariate Time Series Data, IISE 2019 Annual Conference, Orlando, FL
9. Coordinated Inventory Planning for Humanitarian Relief Agencies, YAEM 2016, İzmir, Turkey

Teaching Experiences

Teaching and Research Assistant, University of Florida, FL, 2018-present
- **Instructor:**
  - ESI4611: Advance Data Analytics - EIN6905: Data Analytics for Social Good, Number of Students: 10, Spring 2022
  - ESI4357: Web Based Decision Support Systems, Summer 2020, Number of Students: 23, Evaluation Score: 4.44/5
  - ESI4357: Web Based Decision Support Systems, Spring 2020, Number of Students: 62, Evaluation Score: 4.53/5
- **Recitation Leader and Grader:** Data Analytics, Systems Simulation

Teaching and Research Assistant, The University of Alabama, AL, 2016-2018
- **Recitation Leader and Grader:** Computer Simulation, Introduction to Operations Management

Özyeğin University, İstanbul, Turkey, 2012-2016
- **Recitation Leader and Grader:** Operations Research, Mathematical Programming, Logistics Management, Statistics

Service to Profession

- Reviewer for:
  - IEEE Transactions on Automation Science and Engineering
  - Journal of Global Optimization
  - Energy Systems
  - Operations Research Forum

Professional Memberships

- Institute of Industrial and Systems Engineers (IISE)
  Institute for Operations Research and the Management Sciences (INFORMS)

Graduate Course Works

University of Florida	Linear Programming, Fundamental Mathematical Programming, Stochastic Processes, Applied Probability and Statistics, Machine Learning, Advance Data Structures, Data Analytics and System Monitoring, High Dimensional Data Analysis
The University of Alabama	Linear Programming, Supply Chain Modeling and Analysis, Inventory Management, Operations Scheduling Problems, Integer Programming, Production Management Models, Game Theory, System Simulation, Mathematical Statistics, Statistical Data Management, Applied Design of Experiments
Özyeğin University	Linear Programming, Supply Chain Management, Integer Programming, Stochastic Models, Production Operations Management, Game Theory, Advanced Simulation, Design and Operations of Transportation Networks
MIT Zaragoza Logistics Center	(Through PhD Summer Academy) Location Modelling, Dynamic Programming, Networks in Supply Chain Management, Tactical Planning Models

Computer Skills

Programming Languages	C, C++, Python, MATLAB
Optimization	CPLEX
Simulation	ARENA, Simio

Languages

English (advanced), Turkish (native)

Interests

Hobbies:	Running, video editing, reading (philosophy, psychology), skateboarding, percussion
Volunteer Activities:	Secretary of North Central Florida Human Trafficking Task Force, United Way Emerging Leaders United member