

## RESEARCH INTERESTS

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Revenue Management, Consumer Choice and Behavior, Applied Game Theory, Queueing Theory and Applications, Healthcare Operations Management.

## EDUCATION

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Ph.D. Operations Management, Northwestern University, 2010.

M.S. Industrial Engineering, Koç University, Turkey, 2006.

B.S. Industrial Engineering, Middle East Technical University, Turkey, 2004.

## WORK EXPERIENCE

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Associate Professor, Operations & Business Analytics, University of Oregon, 2017 - Present.

- Robert J. and Leona M. DeArmond Research Scholar, University of Oregon, 2018- Present

Assistant Professor, Operations & Business Analytics, University of Oregon, 2010 - 2017.

## PUBLICATIONS

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1. Rationing Scarce Healthcare Capacity: A Study of the Ventilator Allocation Guidelines During the Covid-19 Pandemic in the United States, with D. Anderson, T. Aydınliyım, M. Bjarnadottir, and M. Anderson. *Production & Operations Management*, Forthcoming
2. Managing Service Systems via Disguised Queues: The Role of Customers' Retaliatory Behavior, single author. *Decision Sciences*, Vol: 52, No: 2, 2021.
3. What if Hotelling's Firms Offer Mass Customization? with A. Yazdani-Tabaei and M. Pangburn. *Decision Sciences*, Vol: 51, No: 2, 2020.
4. Skill Management in Large-scale Service Marketplaces, with G. Allon, and A. Bassamboo. *Production & Operations Management*, Vol: 26, No: 11, 2017
5. Mass Customization and Guardrails: 'You Can't Be All Things To All People' with M. Pangburn. *Production & Operations Management*, Vol: 26, No: 9, 2017.
6. Saving Seats for Strategic Customers, with M. A. Lariviere. *Operations Research*, Vol: 61, No: 6, 2013.
7. Large Scale Service Marketplaces: The Role of the Moderating Firm, with G. Allon, and A. Bassamboo. *Management Science*, Vol: 58, No: 10, 2012.
8. Dynamic Pricing and Scheduling in a Multi-Class Single-Server Queueing System, with F. Karaesmen, and E.L. Örmeci., *Queueing Systems*, Vol: 67, No: 4, 2011.
9. Effects of System Parameters on the Optimal Policy Structure in a Class of Queueing Control Problems, with F. Karaesmen, and E. L. Örmeci, *Queueing Systems*, Vol: 61, No: 4, 2009.
10. Structural Results on a Batch Acceptance Problem, with F. Karaesmen, and E. L. Örmeci, *Mathematical Methods of Operations Research*, Vol: 66, No: 2, 2007.

## SUBMITTED MANUSCRIPTS

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11. Implications of Innovative Engineering Design on Closed Loop Supply Chain Coordination: Incentives for Input Material Reduction vs. Enhanced Recycling, with T. Aydınliyım and N. Murthy. Invited for 3<sup>rd</sup> round review, *Production & Operations Management*.
12. Sample Boxes for Retail Products: Bundling Experience Goods to Leverage Consumer Uncertainty, with A. Yazdani-Tabaei and M. Pangburn. Invited for 3<sup>rd</sup> round review, *Manufacturing & Service Operations Management*.
13. Optimal Seller Induced Learning: Mixed or Separate Product Trials, with M. Jalili and M. Pangburn. Invited for 2<sup>nd</sup> round review, *European Journal of Operational Research*.
14. Impact of Ridesharing Platforms on Hospitals' Emergency Department Admissions, with S. Piri, M. Pangburn. Submitted to *Journal of Operations Management*.

## MANUSCRIPTS COMPLETED OR IN PREPARATION

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15. Economics of Introducing a Mobile Clinic as an Added or Exclusive Modality for Dialysis Service, with M. Jabbari and N. Murthy.
16. A Mathematical Model for a Patient-Centric Dialysis Network, with M. Jabbari and N. Murthy.
17. Design Of Returnless Refunds In Online Retailing, with A. Yazdani-Tabaei, M. Jalili and M. Pangburn.

## TEACHING EXPERIENCE

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*Sports Analytics*, University of Oregon: Spring 2021, Winter 2022, Spring 2022.  
*Business Analytics 1*, University of Oregon: Fall 2018, Fall 2019, Winter 2021, Spring 2021, Winter 2022.  
*Database Management Systems*, University of Oregon: Winter 2019.  
*Service Operations*, University of Oregon: Fall 2015, Fall 2016, Fall 2017.  
*Business Information Systems*, University of Oregon: Between Winter 2011 and Winter 2018 (Over 20 sections, including honor sections).  
*Non-linear Optimization (PhD level)*, University of Oregon: Winter 2015

## UNIVERSITY SERVICES

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*Coordinator*, Operations & Business Analytics Department Ph.D. Program (2013- 2020, 2021-).  
*Chair*, University of Oregon Academic Requirements Committee (2014- 2015, 2016-2017).  
*Chair*, University of Oregon Scholastic Review Committee (2022-2023).  
*Co-chair*, PhD Thesis Committee of Alireza Yazdani, University of Oregon (2017-2019).  
*Member*, PhD Thesis Committee of Mona Jabbari, University of Oregon (2019- 2021)  
*Member*, University of Oregon Scholastic Review Committee (2020-).  
*Member*, University of Oregon Academic Council (2014- 2015, 2016-2017, 2022-2023).  
*Member*, University of Oregon Academic Requirements Committee (2012- 2018, 2022-).  
*Member*, University of Oregon Scholarship Committee (2011-2013).  
*Institutional Representative*, PhD Thesis Committee of Dan Raies, University of Oregon (2019).

## PROFESSIONAL SERVICES

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*Track Chair*, Marketing & OM Interface, 2016 POMS Annual Meeting.

*Track Chair*, Service Systems and Operations, 2022 DSI Annual Meeting.

*Session Chair*, INFORMS Annual Conference, 2013 & 2015 & 2017.

*Session Chair*, POMS Annual Conference, 2013 & 2015 & 2018.

*Editorial Review Board*, Production & Operations Management (2015-Present).

*Editorial Review Board*, Decision Sciences (2020-Present).

*Reviewer*, Management Science, Operations Research, Manufacturing & Service Operations Management, Production & Operations Management, Naval Research Logistics, Decision Sciences Journal, Quarterly Journal of Operations Research.

## INVITED SEMINARS

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M&SOM Service SIG 2012 (New York, NY), June 2012

- Acceptance Rates: 20-25%. Discussant: Prof. Robert A. Shumsky, Dartmouth College.

Hong-Kong University Science and Technology, February 2010.

Wharton School of Business, University of Pennsylvania, February 2010.

University of Oregon, February 2010.

European School of Management and Technology, February 2010.

London Business School, February 2010.

Rotterdam School of Management, February 2010.

University of Michigan- Dearborn, January 2010.

## RECENT CONFERENCE PRESENTATIONS

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“Sample Boxes for Retail Products: Bundling Experience Goods to Leverage Consumer Uncertainty,”

- INFORMS Annual Meeting 2019 (Seattle, WA),
- POMS Annual Meeting 2019 (Washington, DC),
- M&SOM Annual Meeting 2018 (Dallas, TX).

“Optimal Seller Induced Learning: Joint or Decoupled Product Trials,”

- INFORMS Annual Meeting 2019 (Seattle, WA).
- POMS Annual Meeting 2019 (Washington, DC).

“Managing Service Systems via Disguised Queues: The Role of Strategic Customer Behavior,”

- INFORMS Annual Meeting 2018 (Phoenix, AZ).
- POMS Annual Meeting 2017 (Seattle, WA).

“Implications of Innovative Engineering Design on Closed Loop Supply Chain Coordination,”

- POMS Annual Meeting 2019 (Washington, DC).

“What if Hotelling’s Firms Offer Mass Customization?”

- INFORMS Annual Meeting 2018 (Phoenix, AZ),
- POMS Annual Meeting 2017 (Seattle, WA).

## GRANTS

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*Collaborating Faculty* with Principal Investigator, Nagesh N. Murthy on “*Jobs and Innovation Accelerator Challenge (JIAC-I) Grant*” for Clean-Tech Cluster in Oregon, Federal Granting Agency: Economic Development Agency, \$178,000, 2011.

## HONORS AND AWARDS

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*M&SOM Journal Meritorious Service Award*, 2015.

*INFORMS Future Academician Colloquium*, 2009 (San Diego, CA).

*Kellogg School of Management Graduate Fellowship*, 2006-2010.

*TÜBİTAK* (Turkish Scientific and Technical Research Association) *Graduate Fellowship*, 2005-2006.

*Koç University Graduate Fellowship*, 2004-2006.

## COMMUNITY SERVICE

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*Guest Lecturer*, Summer Academy To Inspire Learning (SAIL), University of Oregon. July 2014.

## MISCELLANEOUS

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Citizenship: Republic of Turkey and U.S.A

Marital Status: Married (with one daughter of 8 years old)

1. *Implications of Innovative Engineering Design on Closed Loop Supply Chain Coordination: Incentives for Input Material Reduction vs. Enhanced Recycling (with T. Aydınliyım and N. Murthy)*

Motivated by interactions with a major player in the aerospace industry, we consider the relationship between a supplier of specialty material forgings and a buyer that manufactures fabricated airplane components by extensively machining down these forgings as per complex design specifications. Due to high material removal costs, the buyer prefers these forgings to be as similar in geometry and size to the final component as possible, i.e., near-net-shape. The supplier, by default, does not have the capabilities to deliver such near-net-shape forgings as per technological constraints, but can utilize costly effort and/or invest in the required technologies to achieve forging size reduction. By taking into account uncertainty regarding the correspondence between supplier's effort and resulting output (i.e., reduction in forging size), and potential information asymmetry issues due to supplier's private information regarding costly effort, we assess the implications of two approaches our study firm considers for improving supply chain performance: (i) The buyer can partially subsidize the supplier to induce forging size reduction efforts, and/or (ii) the supply chain can facilitate a higher rate recycling of scrap material to reduce input material costs.

We find that the supplier's input reduction efforts and enhanced recycling across the supply chain interact in non-intuitive ways, thus inflicting a non-monotone effect on supply chain performance; in other words, an increased recycling rate may misalign incentives, and not reduce decentralization cost. We find that enhanced recycling deteriorates supply chain performance the most especially when the recycling rate is moderate, which suggests that our study firm should participate in a supply chain with either superb or insufficient recycling capabilities. Furthermore, when agency issues arise, we find that the buyer should subsidize supplier's forging size reduction efforts only when the recycling level is above a threshold, which helps improve supply chain performance. In contrast, when the recycling level is below the same threshold, the buyer bets on the possibility on contracting with an efficient supplier, (which, by itself, would be motivated to engage in input reduction) and withholds any compensation.

2. *Sample Boxes for Retail Products: Bundling Experience Goods to Leverage Consumer Uncertainty (with A. Yazdani-Tabaei and M. Pangburn)*

Consumers often try a few varieties of an experience product before establishing a shopping routine. In retailing, a sample box typically refers to a package of multiple trial-size varieties within a product category. Sample boxes potentially create value by helping consumers resolve their uncertainties regarding these varieties earlier and at a lower cost. In this paper, we study how firms and consumers share this added value under different market scenarios. Offering sample boxes is a common practice in retailing. This study is the first to address the pricing of sample boxes and show the optimality of offering credit towards a subsequent purchase. We derive the optimal pricing of sample boxes in product categories for which consumers make ongoing purchases over time. We thus extend the literature by proposing a framework that integrates sequential search and seller-induced learning. We analyze a firm's pricing decisions when consumers either purchase full-size options sequentially or bypass that process via a sample box. We use non-linear and dynamic programming to analyze the firm's problem and the consumer's search problem (in the absence of a sample box), respectively. As expected, the informational value of a sample box yields an optimal price premium relative to the prices of individual products. Despite this price premium, we show that the firm's expected profit may decrease since a sample box accelerates consumer learning, and thus may help consumers settle upon their outside option earlier. We establish that a firm can reverse the potential adverse profit impact of

selling sample boxes by introducing an optimally specified future credit. Contrasting the resulting expected profits, with and without the sample-box option, our results highlight that managers may be ill-advised to offer a sample box in the absence of the future-credit mechanism.

3. *Rationing Scarce Healthcare Capacity: A Study of the Ventilator Allocation Guidelines During the Covid-19 Pandemic in the United States (with D. Anderson, T. Aydınliyım, M. Bjarnadottir, and M. Anderson)*

In the United States, even though national guidelines for allocating scarce healthcare resources are lacking, 26 states, including New York State (NYS), have specific ventilator allocation guidelines to be invoked in case of a shortage. NYS developed these guidelines in 2015 as "pandemic influenza is a foreseeable threat, one that we cannot ignore." The primary objective of this study is to assess the existing procedures and priority rules in place for allocating/rationing scarce ventilator capacity and propose alternative (and improved) priority schemes. We first build machine learning models using inpatient records of Covid-19 patients admitted to New York-Presbyterian/Columbia University Irving Medical Center and an affiliated community health center to predict survival probabilities as well as ventilator length-of-use. Then, we use the resulting point estimators and their uncertainties as inputs for a multi-class priority queueing model with abandonments to assess three priority schemes: (i) SOFA-P, which most closely mimics the existing practice by prioritizing patients with sufficiently low Single Organ Failure Assessment (SOFA) scores, (ii) ISP, which assigns priority based on patient-level survival predictions, and (iii) ISP-LU, which takes into account survival predictions and resource use duration. Our findings highlight that our proposed priority scheme, ISP-LU, achieves a demonstrable improvement over the other two alternatives. Specifically, the expected number of survivals increases and death risk while waiting for ventilator use decreases. We also illustrate how priority schemes such as ISP with its sole focus on acute-phase survival odds may be discriminatory with respect to certain demographics and highlight that ISP-LU allocates scarce healthcare capacity in a more equitable way.

4. *Optimal Seller-Induced Learning: Mixed or Separate Product Trials (with M. Jalili, M. Pangburn)*

Many firms offer product trials to allow consumers the option to try products before purchasing. With a product trial, a consumer may find they like a product more than expected, thus stimulating a purchase, but the opposite may be equally likely. Understanding when product trials are profitable, and optimizing the trial structure and associated pricing decisions, is a complex challenge. Product trials are a form of seller-induced learning that we see commonly in practice, but how to structure those trials, and assessing their associated impacts on optimal pricing and segmentation, are issues that have not been previously addressed. For example, using the example of wine tastings, we can address when a seller should include both red and white varieties in a tasting, versus having separate tastings for each, and what are the pricing implications? Product trials can potentially be product specific (separate) or offered jointly across the seller's distinct products. We model and analyze the separate versus mixed trial structures, considering optimal fee-setting and product pricing decisions and the resulting consumer segmentation, in markets with heterogeneous consumers. By analyzing the relative profitability of separate and mixed trials, we have developed a deeper understanding of their distinct strengths. We prove that mixed trials are preferable to separate when customers' trials are more likely to lead to favorable product impressions, and when consumers have a low-to-moderate preference gap between the products. Our results stipulate when sellers should offer mixed tastings across product varieties, versus the alternative separate tastings, or potentially no tastings at all. We also analyze how product-trial fees should be set, as well as the impact of these trial alternatives on product pricing decisions.