

OR/MS TOMORROW

SPRING/SUMMER 2016

Letter from the Lead Editor 2
Featured Interview with Dr. Mokhtar (Mo) Bazaraa 3
Featured Research 5
Student Chapter Spotlight - Penn State INFORMS Student Chapter 6
Undergrad Student Research Spotlight 11
Journal Articles of Interest 12
Upcoming Conferences 16
Editorial Staff 18

Letter from the Lead Editor

Dear Readers,

I am very grateful to announce the Spring/Summer 2016 Issue of OR/MS Tomorrow. As the lead editor for this issue, I want to thank the current editorial team for continuing to provide our readers content that we believe will be interesting to our audience – the future leaders in Operations Research, Management Science, and Analytics.

In the fourth thematic OR/MS Tomorrow issue on Retail Analytics, we provide a better glimpse into the field through from expert commentary from Dr. Mokhtar Bazaraa and applied research being performed at the IBM T.J. Watson Research Center. Moreover, we highlight what could entail the Future of Retail Analytics. We round out this issue by highlighting our community in the student chapter spotlight, society spotlight, and undergraduate student research spotlight. We also highlight some future conferences that you might want to attend that are related to our theme.

Lastly, I hope you enjoy the content. Please feel free to share any feedback by emailing our team at (orms_tomorrow@mail.informs.org)



Matthew A. Lanham

Featured Interview with Dr. Mokhtar (Mo) Bazaraa

Edited by: Matthew Lanham

Q: Tell me a bit about your career in ORMS?

A: I left Georgia Tech probably sometime around end of 1981. I was a full tenured professor then and I went to work for a trucking company. Then I worked for Sabre. After that I came back to Georgia Tech, but not as a professor then, I was managing the Logistics Institute at Georgia Tech. Then I went and worked for a freight forwarding company, “Agility.” Then I came here to Predictix/ LogicBlox.

Q: When you were a professor, what was your primary research area?

A: It was OR/Optimization and Nonlinear programming. I was quite high on nonlinear programming, networks, linear programming, and sometimes in the context of supply chain. My main area of research was simply nonlinear programming.

Q: Speaking of nonlinear programming, many ORMS students have used your linear and nonlinear programming textbooks in their classes. What do you think are probably the most useful aspects of those books if they wanted to use that material in industry?

A: As you know, most people use some batch software, whether it's Gurobi, CPLEX, or what you have, or some nonlinear packages, but I tend to think that hopefully those folks can learn from those books how to approach a problem, or even a theorem, what makes sense, what are you trying to get out of it, what is the geometry? I think this is very important, not on its own, but to get appreciation of how you approach a problem. The work I do now, mostly is modeling.

How to model a problem and to model it in the right way that is efficient and can represent as much of the reality as possible, but in the meantime give you a tractable solution. To me, a specific algorithm or specific theorem is not as important at all. In fact, I don’t ever use any of that [from textbook] in any capacity, but it’s really more about how to approach a problem, how to model it, and come up with the best possible representation.

Q What motivated you to pursue industry?

A: When I was at Georgia Tech, there was a small company called Burnham, which was a trucking company that had 24-25 distribution centers providing transportation and distribution services to many companies especially those in the hi-tech business. I thought they were really ahead of the times then.

Burnham's CEO came to Georgia Tech and he wanted someone to help him with analysis of their business and how to optimize their bids. He talked with me and a few other people and said he wanted to work with me and my colleague, Dr. Dave Fyffe. Dave and I worked together as consultants for Burnham.

One of the first things we worked on with bids was that Burnham did to get the IBM line haul transportation and distribution business. When I examined the problem, it became clear to me that we can formulate it as a linear program, get a significant advantage against the competition, and meanwhile achieve desirable revenue per mile. When we applied the LP to price Burnham's services, the company was awarded most of the line haul transportation from IBM and from other customers. We really "killed" the competition. This is when Ray Crowley, the Burnham CEO went after me to join the company. He said jokingly, "How about joining us and getting an honest job!" I decided to take him up on the offer. I had proved myself in academia, what the hell, I'm still young, so I took a risk and that's how it all started. So I left Georgia Tech and first

decided to just take a sabbatical for a year. I had a lot of fun actually. I really liked working on practical kinds of problems although my research was quite theoretical, but it was clear this was something I really enjoyed.

Q: You are currently EVP at Predictix/LogicBlox. What is different about your company than others providing retailers analytical solutions?

A: First of all there are not many sectors that deal in the shear scale that retailers encounter. In manufacturing and healthcare or other domains, the problems can be large, but in retail where there are 10-100k SKUs, 100-1000s of stores, where you're often modeling at the daily level as opposed to the weekly level because for replenishment, transportation, supply chain, you are concerned with things like - I want to leave this DC on Tuesday and arrive at the store on Wednesday or Thursday so approximately things at the monthly or weekly level is not good enough. You can imagine the problem sizes become large very quickly. For example, a small company can lead to optimization problems with 800M decision variables, and for a large retailer many billions. I think that was the main difference and what attracted me here.

Most companies are not approaching these problems in the way we are. For example, looking at the network flow. They tend to say if I want to replenish from a DC to a store, if the inventory at a store is below a certain level then you apply a simple order quantity to do it, but the problem is you kind of have silos that ignore replenishment activities at other stores, where there might be conflicts, or other issues. You can make a big difference by attacking these problems using OR and large-scale optimization.

Q: What do you think the future of retail analytics will entail?

A: I think there are several aspects. One, which is not an area I'm focused on, is the forecasting and demand planning. It is very important because it feeds the optimization model.

In that domain, machine learning is very attractive. Although I must admit the problems become highly non-linear, non-convex, so scale becomes an issue quickly. The concept of machine learning becomes very attractive, where you can project demand for products you do not even have history for. Using the products attributes is a very good area that we'll see continued growth.

Omni-channel is another domain that is very interesting. For example, a customer may order online and pick up in the store, order in one store for pickup in another store, or the other possible scenarios. Incorporating this sort of flexibility within inventory models is very attractive

Lastly, tackling the scale of problems such as replenishment, allocation, assortment is important. The retail field is quite rich in the problems where OR can be employed. Whether you are looking at the demand side, supply side, or optimization. Adding in the scale of these problems makes the future work in retail analytics very attractive.

Q: What benefits or opportunities do you feel you gained over the years being a member of INFORMS?

A: I always enjoyed networking with old friends at conferences and seeing what is the latest and greatest that people are working on was. Also, I really enjoyed going to the practice conferences because you really get to see how people apply the OR techniques to the many different fields.

When I was at Sabre, we were doing early work on revenue management and that won the Lancaster Prize. Sabre actually won that award twice, maybe two years apart. The paper on the

French National Railroad won the award once. The other time was with Barry Smith on airline revenue management. American Airlines was the real pioneer and that area has grown into a field of its own.

Featured Research

To determine the best location for a store, the optimum mix of merchandise, placement of products or services and even which stores to close or refashion, predictive and prescriptive analytics are playing a major role in retail decision-making. For industry and academicians, retail operations have, hence, emerged as an important area for research in the recent years.

For OR/MS researchers, this translates into topics such as shelf-space allocation, promotions, pricing, staffing and scheduling, assortment planning, and so on. While there are problems faced at the upstream stages, from a retail standpoint, much of the work has been focused on the downstream since businesses seek to leverage their sales channels to the extent possible.

In this issue, we feature the work of Pavithra Harsha, Shivaram Subramanian, and Markus Ettl, at the IBM T.J. Watson Research Center. The paper entitled, “A Practical Price Optimization Approach for Omni-channel Retailing” is focused on modeling location-specific cross-channel demand interactions and development of Omni-channel pricing solutions that are used by several retail chains today.

With most retailers maintaining ecommerce and in-store channels, they are having to take a note of a customer’s shopping behavior that entails navigation through multiple channels (mobile, desktop, brick and mortar, or even social networks) before making a purchase. An Omni-channel approach seeks a unified customer experience along all these touch points to convert browsing to actual sales. The authors argue that the current retail practices of pricing channels are not able to achieve the desired coordination between channels. The integrated pricing optimization formulation that is proposed in this paper is set to tackle competition and sales goals while coordinating prices across channels and store locations. A non-linear, non-convex, NP-hard model is formulated and solved. The model/solution was implemented across three major retail chains (results discussed in the paper) and the exercise saw major profit gains.

Some methodological and computational highlights are:

- Temporal variations in demand accounted for by giving the pricing problem a multi-period treatment. No significant increase in run time of the model was noted.

- Practical value of global optimality was demonstrated instead of the common practice of using heuristics that lead to inefficient local optima. Application produced stable and predictable responses from a user perspective.

- Algorithms could support re-optimization one or more times a day or near real-time. Retailers could significantly benefit as the market attributes dynamically change that require quick response.

“In November 2015, this work was formally recognized by IBM as one of the major accomplishments in 2015 by the research division.”

The article can be read here: http://www.optimization-online.org/DB_HTML/2016/01/5307.html.

Student Chapter Spotlight - Penn State INFORMS Student Chapter

After being dormant for a semester, the Penn State student chapter of the Institute for Operations Research and the Management Sciences (INFORMS) was reactivated in Fall 2014. Since then, the chapter has been working hard to expand and improve engagement with students and industry.

The chapter is open to all students with an interest in operations research (OR)/management science (MS) and topics related to analytics. The chapter currently consists of 30 Ph.D., 15 M.S. and 10 undergraduate students. In Spring 2015, the chapter launched its new website, with the goal of providing its members and potential sponsors an accessible way to learn more about the chapter and its planned activities.

The chapter hosts several events during the year. Between Spring 2015 and 2016 the chapter held a total of 12 major events geared towards graduate and undergraduate students from industrial and manufacturing engineering, mechanical engineering, statistics, supply chain and economics. These events ranged from research seminars and industry presentations to informal picnics. Each

semester, the chapter kicks off by welcoming new students, during which they learn about INFORMS and activities planned for the semester.



Figure 1: Lizbeth Benson kick-starting the workshop



Figure 2: Mr. Shell giving a hands-on workshop on CPLEX

The chapter held two workshops between Fall 2015 and 2016. An “Introduction to R” workshop was held in November 2015. The chapter invited Lizbeth Benson, co-founder of the We R group at Penn State, to give the workshop. We R is an interdisciplinary group of individuals who use or want to learn R for science.

The second workshop was held in March 2016. Martin Shell, a client solution professional in IBM’s Decision Optimization Group gave a hands-on workshop on CPLEX. Martin is a member of the INFORMS Edelman Academy as well as a Certified Analytics Professional.

The chapter invited two industry representatives to talk about how OR and analytics is used in their day-to-day operations and what they look for in potential new hires. Ronald Dravenstott, a senior operations research modeler at Geisinger Health System, gave a presentation titled “Improving the Care and Delivery Process through Operations Research and Predictive Analytics.” Two of Penn State’s alumni – Kalpesh Munot and Rahul Gandhi – gave a

presentation on “Consulting 101.” It was the first-ever session held by Deloitte targeted for Penn State industrial engineers. More than 80 students attended the information session, making it the largest attended event of the year for the chapter. The seminars were followed by informal discussions and dinner.



Figure 3: Kalpesh Munot talking about what is consulting

Continuing the tradition from previous years, the chapter sent 10 members to attend the INFORMS Annual Meeting in Philadelphia from Nov 1-4, 2015. The chapter secured partial funding for its members towards conference registration, lodging and travel reimbursement.

INFORMS also hosted a research presentation about healthcare analytics in February 2016. Yi-Shan Sung, a doctoral candidate in industrial engineering at Penn State presented her research on health care analytics and network analytics.

The chapter officers also attended the Fall Engineering Reverse Career Fair 2015. The event gives employers the opportunity to meet representatives from student organizations, research centers and diversity programs in the College of Engineering and College of Earth and Mineral Sciences at Penn State.

Besides these events, the chapter organized a networking dinner and a spring picnic, at which chapter members could meet their peers and professors from the department in an informal setting.

The picnic was held in April 2016, in collaboration with Industrial Engineering Graduate Association (IEGA). The event concluded by awarding two of our previous officers, Angela Garza and Hamza Adeinat, with the “Penn State Student Chapter Moving Spirit Award” for their outstanding contribution to the chapter in previous years.

Chapter President Deepak Agrawal was recently elected as the student chapter representative on the INFORMS Subdivision Council for 2016-17. As one of the student chapter representatives, Agrawal acts as a liaison between more than 60 student chapters and INFORMS committees, and facilitates policy development.

The student chapter plans to use the INFORMS Speaker Program to invite distinguished researchers to supplement Penn State IME Department’s weekly OR and Industrial Engineering Colloquium series.



Figure 4: Some of our members and alumni at the INFORMS conference in Philadelphia

The chapter has also been collaborating with IEGA to hold student mixers in the coming year. The chapter plans to host student seminar series to encourage students from different research areas to learn more about INFORMS, and to learn about different applications of OR and analytics.

Undergrad Student Research Spotlight

Name of Project: Optimizing load allocation for an electric utility provider to meet forecasted demand
Students: Julie Mulvaney-Kemp, Will Strauss, Lukas Rees
Academic Affiliation: Department of Electrical and Systems Engineering, Washington University

Unexpected and rapid changes in the market is a trend that is more than well-known to people from all walks of life. Energy products, in particular, are some of the most unpredictable goods involved in the markets, and the deregulation of utilities in a numerous arenas have exposed end-users to market risk. A group of undergraduate students from the Department of Electrical and Systems Engineering at Washington University decided to put their educational skills towards studying energy which is an important issue to consumers, utilities, and politicians alike.

'The ability to estimate future electricity costs can help consumers and politicians form a more informed plan for the future. In order to manage energy costs, electricity production should mirror demand or have the ability to be stored for later use.'

(Excerpt from the paper)

Being interested in the energy sector, and having prior experience in mathematical modeling, the students, Julie, Will and Lukas chose to investigate two issues relevant to energy security.

- Short-Term Electricity Demand Forecasting
- Optimal Power Plant Scheduling.

During the demand forecasting phase, the students used a double-seasonal holt-winters forecasting method to use a scaled energy demand dataset to approximate future electricity demand for a regional electric utility provider, Kansas City Power and Light (KCPL), an electric utility serving 800,000 customers in 47 counties in Missouri and Kansas.. The Holt-Winters forecasting method is essentially a means of performing an Exponential Smoothing. What this entails is a statistical technique for detecting significant changes in data by ignoring the fluctuations irrelevant to the purpose at hand. In exponential smoothing, older data is given progressively-less relative weight whereas newer data is given progressively-greater weight. While the standard model has been used

successfully in seasonal forecasting, the researchers from Washington University used an extended model that accounts for two seasonal patterns. The group used R (the statistical software) for this purpose.

The next phase involved using a binary integer programming (BIP) model to find the optimal solution to the unit commitment problem. The model determined when power plants should be turned on in order to meet the expected demand and minimize cost. The model output the cost, when plants should be starting (most plants require multiple time intervals to power up), and when the plants should actually be running. The Excel Solver was used in tandem with Frontline Solvers to perform the Binary Integer Programming.

Once the optimal allocation was determined, the group ran a series of analyses including modeling both day-ahead and week-ahead scenarios of running the plants with the goal of minimizing costs for the provider while also meeting demand constraints and operational constraints of the plants. Due to high price variability and KCPL's future plans to increase the amount of electricity it generates from natural gas, the researchers decided to see how changing fuel prices affected the use of the different plants. From the optimal and near-optimal solutions of the various plant-scheduling scenarios, they noted that the overall prices of electricity per kilowatt hour in their model was below the current price of electricity for Missouri consumers. While the group of researchers faced difficulties along the way with regards to computational intractability and unavailability of exact data, the model they developed is robust enough to account for adjustment to changing fuel prices.

The project, performed as a part of their Capstone Design Project, under the supervision of Professors Jason Trobaugh and Zachary Feinstein gave the students an excellent opportunity to be engaged in highly motivating and educational research that prepared them for the next stage of their careers. Will and Lukas now work for Epic in Madison, WI while Julie works for Brain and Company in Houston, TX.

Journal Articles of Interest

Retailer's Rationale to Refuse Consumer Returns in Supply Chains

Lu Hsiao, Ying-Ju Chen
Journal: Naval Research Logistics

This review highlights the article "Retailer's Rationale to Refuse Consumer Returns in Supply Chains" by Hsiao and Chen. While there are still some retailers who insist on "no return" policy, the authors investigate an economic rationale for these seemingly unreasonable strategies. By

comparing “with return” and “no return” policies using equilibrium characterization, the profit is compared from the retailer’s, manufacturer’s, and consumer’s point of view. The results show that even if the manufacturer has a lower salvage value than the retailer, channel returns should still be offered. According to the results, consumer and channel returns should be offered only when the product reliability is moderate and the valuation of the low segment is moderate. Without consumer returns, the product quality unambiguously increases when the product reliability is enhanced. Based on the outcomes of the research, even online sellers can revise their return policies that consumers, retailers, and manufacturers can benefit from.

Hsiao, L., & Chen, Y. J. (2015). Retailer's rationale to refuse consumer returns in supply chains. Naval Research Logistics (NRL), 62(8), 686-701.

Robust optimization of the 0–1 knapsack problem: Balancing risk and return in assortment optimization

Robert P. Rooderkerk, Harald J. van Heerde
Journal: European Journal of Operational Research

The next article we highlight comes from Dr. Robert Rooderkerk, Assistant Professor of Empirical Research Methods at the Rotterdam School of Management, along with his collaborator Professor Harald J. van Heerde at Massey University. They offer a heuristic-based approach to optimize a retailer’s assortment that considers both expected profit as well as the assortment’s corresponding risk. They show that their approximations yield optimal assortments to the robust assortment optimization problem, which makes it practical to a retailer because they often necessitate a real-time solution over large data sets.

They show that assortment generation is challenging because complete enumeration of all assortments is computationally impractical, thus having the ability to achieve an approximation of the near-optimal assortment planning problem is very advantageous to retailers. Research to date to investigate the tradeoff of risk in assortment optimization has been both theoretical (Cardozo and Smith Jr, 1983; Devinney and Stewart 1988) and computationally numerical (Rusmevichientong and Topaloglu, 2012). As suggested by (Kouvelis, Chambers et al., 2006) empirical investigations of this problem are still lacking. Rooderkerk and Van Heerde (2016) strive to fill this gap by focusing on the special case of the 0-1 knapsack problem, with the aim of maximizing the total expected benefit of all products in the knapsack (e.g. assortment). This focus is different than most that focus directly on maximizing sales or profit alone, as they account for the uncertainty in each item’s marginal benefit.

They accomplish this by providing the retailer an Efficient Frontier visualization that would help aid the retailer in gauging how risk averse they want to be. The practical advantages here for the retailer is most likely the retailer does not know how risk averse they are before inspecting the visualization trade-off among risk and reward. After discussion with internal stakeholders, a transparent decision could be made. Once those risk-return parameters are specified, assortments can be analyzed. We imagine such an approach could indeed be understood by retail decision-makers and actually used in practice, which is the other reason we recommend this piece to our readers.

When we asked Dr. Rooderkerk what make's assortment optimization so interesting to him, he told us, "What interests me most about assortment optimization is that it requires a multidisciplinary perspective: psychology and marketing for a profound understanding of how consumers interact with assortments, statistics, and econometrics to model that interaction, and OR to optimize the assortment given the revealed interaction." As we discussed the complexities of analytics in retail, he stated "It is fascinating to see how an assortment is more than the sum of its parts; the competition between two SKUs depends on the presence of other SKUs and the individual shelf assignments together imply a certain layout that affects consumer perceptions of variety and complexity of the assortment. It is challenging to model these higher-order interactions, let alone optimize assortments in their presence."

It was clear to us that Professor Rooderkerk has a passion for Retail Analytics - especially assortment optimization, and we look forward to his future contributions in this domain.

Rooderkerk, R. P. & H. J. Van Heerde (2016). "Robust optimization of the 0–1 knapsack problem: Balancing risk and return in assortment optimization." European Journal of Operational Research 250(3): 842-854.

Escaping your Comfort Zone: A Graph-Based Recommender System for Finding Novel Recommendations among Relevant Items

Kyogu Lee, Kibeom Lee
Journal: Expert Systems and Applications

Recommendation systems are, today, an important facet of any player in the e-commerce industry. From offering news articles to on-line newspaper readers to offering customers of an on-line retailer suggestions on what they might like to buy, recommender systems are highly influential in the field of business analytics. In this paper, Kibeom Lee and Dr. Kyogu Lee discuss some potential issues in current recommender systems such as the fact that they suffer from popularity bias (leading to

recommendations composed of popular items). The researchers identified the need to determine recommendations that are more likely to be unknown to the user while still being relevant. The concepts of Shannon's entropy and linked items in a graph were used to generate the proposed recommendation system. While evaluating their algorithm (GraphRec) and testing it against a state-of-the-art Matrix Factorization algorithm (MF), the authors noted that there is indeed a trade-off between novelty and relevance when it comes to identifying recommendations. However, the study also showed that when both these criteria were combined, the GraphRec algorithm consistently outperformed the MF algorithm in recommending simultaneously novel and relevant items.

Lee, K., & Lee, K. (2015). Escaping your comfort zone: A graph-based recommender system for finding novel recommendations among relevant items. Expert Systems with Applications, 42(10), 4851-4858.

A Demand Estimation Procedure for Retail Assortment Optimization with Results from Implementations

Marshall Fisher, **Ramnath Vaidyanathan**
Journal: Management Science

The final article we highlight is in the field of assortment planning. A retailer's assortment is the type, combination, and quantity of products it carries based on customer demand and preferences that are to be observed in the future. This paper considers the problem of selecting a certain assortment of stock keeping units for each store managed by a retailer. These units have peculiarities and attributes that contribute toward estimation of demand of any potential stock keeping unit by application of maximum likelihood estimation to sales history. Several heuristics are proposed for picking the most profit maximizing, subject to shelf space bound, assortment. The model and approach are applied to three real cases of snack cakes, tires, and automotive appearance chemicals. The application led to successful implementation, validation, and sales increases of 5.8% and 3.6% for tires and appearance chemicals, respectively. These were noted to be significant improvements "relative to typical retailer annual comparable store revenue increases".

As pointed out by the authors, contribution of this paper to the current literature in this space is three fold: (i) Estimation of the impact of assortment localization on revenue, (ii) Forecast of demand of stock keeping units not previously carried by the retailer through historic sales data of products currently carried, and (iii) Demonstrated usage of a new demand model that fits situations in which certain products present themselves are better substitutes for a given product than others.

Fisher, M., & Vaidyanathan, R. (2014). A demand estimation procedure for retail assortment optimization with results from implementations. Management Science, 60(10), 2401-2415.

Upcoming Conferences

INFORMS Conference on Business Analytics & Operations Research
Sunday April 10 2016 – Tuesday April 12 2016
Orlando, Florida
http://meetings2.informs.org/wordpress/analytics2016/

Analytics 2016 is highly relevant to this semester's issue of ORMS Tomorrow with its focus on applying techniques from business analytics and operations research to problems in industry. One highlight of this event is the annual Franz Edeleman Competition, in which corporations, non-profits, and government organizations compete to present the cutting-edge OR solutions which they have developed to solve real-world problems. This years' finalists include UPS, the New York City Police Department, and the Chilean Professional Soccer Association. The conference also features an Early Career Connection event specifically for young professionals, as well as the opportunity to take INFORMS' Certified Analytics Professional (CAP) exam.

Revenue Management & Pricing Section Conference
Thursday June 16 2016 – Friday June 17 2016
New York University, New York
https://www.informs.org/Community/revenue-mgt/Conferences
The Revenue Management & Pricing Section's annual conference seeks to educate both academics and practitioners in pricing analytics and revenue management. It features the award ceremony for the Practice Award, which recognizes excellent applications of revenue management and pricing. To learn more about this section, check out this issue's Society Spotlight.

Marketing Science Conference
Thursday June 16 2016 – Saturday June 18 2016
Shanghai, China
http://www.fdsm.fudan.edu.cn/marketingscience2016/call_for_paper.html
This conference is hosted by INFORMS' Society for Marketing Science and examines marketing science through the lenses of practitioners and scholars alike. Last year's conference had over 700 participants and featured nearly 600 research presentations. Seventeen concurrent sessions spanned a broad array of topics including advertising, market measurement, internet research, social and mobile marketing, and decision neuroscience.

2016 INFORMS International
Sunday June 12 2016 – Wednesday June 15 2016
Waikoloa Village, Hawaii
http://meetings2.informs.org/wordpress/2016international/
INFORMS' annual international meeting is brimming with opportunities on a wide range of topics. At press time, the complete schedule is yet to be announced, but highlights include a plenary talk by

Dr. Gang Yu, whose C.V. boasts roles such as VP of Supply Chain Operations at Amazon, VP of Procurement at Dell, and founding the leading ecommerce company in China. He has also been honored as a winner of the Franz Edelman Management Science Achievement Award, among many other honors.

Editorial Staff

Editor-In-Chief
OR/MS Tomorrow



Sara Nourazari

Lead Editor
Spring/Summer 2016 Issue



Matthew Lanham

Co-Editors



Siddhartha Nambiar



Shivani Shukla



Emily Elizabeth Riederer



Bismark Singh

Editorial Board



Probal Mojumder



Mohammad Moshref Javadi