INFORMS Health Applications Society

Fall 2019 Newsletter

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Inside the Newsletter

Message from the President.......................................................... Page 2
Remarks from President-elect Mark Van Oyen.......................... Page 3
2019 Bonder Scholarship for Applied Operations Research in Health Services............. Page 5
2019 Pierskalla Award................................................................ Page 6
2019 HAS Student Paper Competition........................................ Page 7
HAS Highlights at 2019 INFORMS Annual Meeting....................... Page 8
Research Spotlight: Hadi El-Amine.............................................. Page 9
Research Spotlight: Sze-chuan Suen........................................... Page 10
HAS Officers.............................................................................. Page 11
Message from the President

Dear HAS Community,

Serving as the HAS President this year has been an amazing experience, one which I enjoyed greatly and learned a lot from. Now it is time to pass the torch on to the capable hands of Mark Van Oyen as our 2020 President. I am also excited to welcome new board members in 2020, who will bring fresh new perspectives.

As I am reflecting upon this year, I will say that our society is excellent health, with many new ideas and boundless energy; our members always provide their time and expertise to support the society; and our membership is strong and steady. There have been several new exciting initiatives this past year, and I know that this will continue under Mark’s leadership.

First, my heartfelt thanks go to Sanjay and Panna Mehrotra for their generous endowment, which enables the society to recognize mid-career researchers who have made significant contributions to the practice of health applications through OR/MS modeling and methodologies. The winner of the very first Sanjay and Panna Mehrotra Research Excellence Award will be announced at the 2020 HAS Business Meeting! I want to also express my thanks to Diwakar Gupta and Sanjay Mehrotra, for generously agreeing to serve as the founding Department Co-editors for the new healthcare department at Naval Research Logistics. The society is sponsoring this new department, and will be appointing the department editors on a regular basis from among HAS members. The Strategic Initiatives with Academic Journals Committee, comprised of Tinglong Dai (chair), Oguzhan Alagoz, Nicos Savva, and Sze-Chuan Suen, has been instrumental in this development, and I want to thank them for their service.

As we are getting ready to transition to the 2020 Board, please join me in extending a huge thank you to our outgoing Board Member and Past President, Lisa Maillart, whose leadership has left the society in excellent health. I am sure the board will continue to rely on Lisa for advice and suggestions. I also want to thank our Secretary, Jackie Griffin, and Treasurer, Mariel Lavieri, for significant contributions to the society over the years. I am pleased that Hui Zhao will be returning in her role as the Communications & Outreach Coordinator; Council Members, Jagpreet Chhatwal, Anahita Khojandi, and Osman Ozaltin, will be returning for their second year; and we will be welcoming Hadi El-Amine as our Secretary and Sze Sze-Chuan Suen as our Treasurer. We have two outstanding candidates for the Vice President position, Timothy Chan and Maria Mayorga, and our elections will be held soon. We will also be seeking nominations for the 2020 Student Liaison positions soon.

I want to finish this letter by expressing my excitement for the direction the society will be taking under Mark’s leadership. As always, your comments and suggestions are most welcome.

Warmly,

Ebru Bish
Associate Professor
Grado Department of Industrial and Systems Engineering
Virginia Tech
HAS is Maturing and Adjusting to Rapid Change:  
Remarks from President-elect Mark Van Oyen

The next year promises to again be an exciting one for HAS with many challenges and opportunities before us. Looking forward to next year and serving our wonderful society as President, it gives me confidence to see the passion that so many members have for research and practice in our area. Our society has been stable in size for several years, suggesting that we are maturing. I am convinced from the content of our recent research that we are indeed maturing, and that is positive. We continue to see great interest in healthcare from young researchers, which brightens our outlook. It also strikes me that our society is maturing in terms of our footprint in addressing the many dimensions of healthcare. We will continue to see our journal outlets evolving and improving. Part of this is the opening up of opportunities with additional journals. For example, journals like Naval Research Logistics, Service Science, and INFORMS Journal on Computing are more intentionally welcoming healthcare applications research. Given the dazzling array of topics and research methods being addressed by HAS member and those outside our community, I believe this poses some challenges as well. Those who are attempting to implement their research in healthcare delivery improvement (especially from outside the organization) often learn just how difficult it is and how many barriers must be overcome. Despite this, many of us encounter reviewers who make implementation a prerequisite for publication. Yet, implementation is not a requirement in most other domains. With the huge barriers to implementation in healthcare, why should that be a prerequisite? Sometimes, even those doing healthcare policy are asked for proof of implementation, which is often not possible. On the theoretical side, some are pursuing cutting-edge methodological work that promises to benefit healthcare or medical decision making. Compared to most application research, such researchers will find it difficult to tie the research as intimately to the details of the application, as is usually the case with a large amount of theoretical content. I have always found that addressing messy applications in healthcare enlightens me to ways in which existing theory and methods must be extended. So, I see a very healthy interplay between caring about solving real world problems while also caring about methodological advancements in our field. As a society, I think we will have to get better at appreciating and evaluating the variety of different approaches that are legitimate and useful in their own right; otherwise, the research will be narrowed and focused to meet the needs of the reviewing process with decreased attention to the needs of society.

For those of us in the United States, and potentially other countries as well, there is great uncertainty surrounding what agendas and policies for healthcare will prevail in the context of great political tension and polarization. No matter what happens, we can be sure that the needs for care improvement will continue and our society can contribute in many ways, including work specifically on policy. Fortunately, for many of us, research and application work driving increase quality, reduced cost/waste, and improved patient outcomes is essential no matter how the politics and policies play out.

I hope that you were able to attend the annual conference in Seattle and that it has left you with good memories, new insights, and new acquaintances and friends. To our chagrin, some of us found registering in time for our first session and locating the “other” building hosting most HAS sessions were some of the larger challenges (yes, I was one of them).

I knew that there was a lot of variety within HAS, because Hui Zhao and I co-organized the cluster. Even...
so, I find it hard to get my mind around the vast range of methods used and problems we address. It is not possible to catch a large fraction of the action with 70 HAS sessions and over 325 talks. I was delighted that our “Meet the Editors” session brought insights from, alphabetically by journal, David Dobrzykowski (DS), Greg Zoric (HCMS), Paul Brooks (IJOCS), Stefan Scholtes (Man. Sci.), Morris Cohen (MSOM), Sanjay Mehrotra (NRL), Ozlem Ergun (OR), and Andrew Schaefer (Serv. Sci.). These journals and many others such as IIE Trans. on Healthcare Systems Engr. and POM offer a broad portfolio of publication options for us. In the session, we saw some daylight between the journals in terms of the qualities each journal emphasizes.

In addition to special sessions for the Pierskalla Award finalists and Bonder Scholars, we introduced a lightning round for Students and Post-docs on the job market that was organized by Anahita Khojandi and Hadi El-Amine. While it will take some time for search committees to be aware of this opportunity, I hope this will be a valuable opportunity for HAS like it has been for the QSR society. Personally, I enjoyed the distinguished lectures and the panel session Machine Learning for Healthcare. It was great to hear perspectives from some of our leaders.

This past year has been an interesting one for HAS with multiple issues to address and new initiatives to kick off. I have appreciated and relied upon a truly kind, professional, and mutually supportive group on the HAS board and the council members that help us with focused tasks by special assignment. Every single member of the team has been wonderful. I am so grateful to have been closely assisted in learning the VP role by President Ebru Bish and Board Member and Past President, Lisa Maillart. So much has happened this year under Ebru that I expect next year may focus on maintaining and nurturing the initiatives and activities that have been created and seeded in recent years.

I look forward to your participation in HAS. I also welcome your input about needs and opportunities to advance HAS in 2020. Please consider contributing your ideas, suggestions, time, energy, and work to help keep HAS strong and useful to all of us and to posterity.

Cheers!

-Mark Van Oyen

Professor of Industrial and Operations Engineering

University of Michigan
2019 Bonder Scholarship for Applied Operations Research in Health Services

As announced at the HAS business meeting, the 2019 Bonder Scholarship was awarded to David Middlebrath from Rice University for his research on “Optimizing Waitlist Composition from the Transplant Center’s Perspective.” Mildebrath’s research advisor is Andrew Schaefer.

Many thanks to this year’s award committee chair, Elisa Long.

**About the Bonder Scholarship:** The purpose of the Bonder Scholarship for Applied Operations Research in Health Services is to promote the development and application of operations research analyses to health care design, delivery, and operations. The scholarship provides funding of $5,000 to support the development of promising new researchers in healthcare operations research.
2019 Pierskalla Award

As announced at the HAS business meeting, the 2019 Pierskalla Best Paper award goes to Arielle Anderer, Hamsa Bastani, John Silberholz for their paper, “Adaptive Clinical Trial Designs with Surrogates: When Should We Bother?”. 

The runner-up and finalists were:
- Zhijin Zhou, Yingfei Wang, Hamed Mamani, David G. Coffey, “How Do Tumor Cytogenetics Inform Cancer Treatments? Dynamic Risk Stratification and Precision Medicine Using Multi-Armed Bandits” (runner-up)
- Baris Ata, Yichuan Ding, and Stefanos Zenios, “Achievable Region-Based Approach for Kidney Allocation Policy Design with Endogenous Patient Choice” (finalist)
- Sze-Chuan Suen, Diana M. Negoescu, and Joel Goh. “Design of Incentive Programs for Optimal Medication Adherence” (finalist)

Congratulations to the winners and all the finalists for this important achievement! Many thanks to co-chairs Pengyi Shi and Jonathan Helm and to all of the judges involved.

About the Pierskalla Best Paper Award: The Pierskalla Award recognizes research excellence in the field of health care management science. The award includes a $1,000 honorarium for the best paper presented in a Health Applications Section sponsored session at the annual INFORMS conference. The award is named after Dr. William Pierskalla to recognize his contribution and dedication to improving health services delivery through operations research. Dr. Pierskalla is a Distinguished Professor Emeritus at the Anderson School at UCLA and the Ronald A. Rosenfeld Professor Emeritus, The Wharton School, University of Pennsylvania, and serves as an editor on numerous operations research journals.
2019 HAS Student Paper Competition

As announced at the INFORMS Healthcare conference, the 2019 HAS Student Paper Competition winner was Shasha Han, from the National University of Singapore. The second place prize was awarded to Hussein El Hajj from Virginia Tech.

Other finalists include Michael Fairley (Stanford University), Shujing Sun (University of Rochester), and Yunchao Xu (New York University).

Many thanks to this year's award committee co-chairs, Timothy Chan and Nicos Savva.
HAS Highlights at 2019 INFORMS Annual Meeting

Once again the HAS community was very active at the recent 2019 INFORMS Annual Meeting, with 72 sponsored sessions including over 325 presentations. These include multiple joint session with other societies including MSOM, Minority Issues, Applied Probability, Analytics, Data Mining, and Practice, among others. Some highlights from the event included panels focused on “Machine Learning for Healthcare” and “Meet the Editors for Healthcare Research”. Additionally, we had three HAS Distinguished Speaker sessions that included presentation by Turgay Ayer, Mohsen Bayati, Dimitri Bertsimas, Ebru Bish, Wallace Hopp, and Martin Puterman.
Research Spotlight: Hadi El-Amine

Hadi El-Amine, Assistant Professor of Systems Engineering and Operations Research at George Mason University is interested in stochastic modeling, optimization, and decision making under uncertainty, and generally in research that lies at the interface between Operations Research and Machine Learning. His recent work uses combinatorial and robust optimization to devise efficient and accurate machine learning algorithms for clustering and prediction based on high-dimensional data. The applications of his research are mainly in the areas of healthcare resource allocation for heterogeneous populations.

In a recent collaboration with the George Washington University Transplant Center, he is working on the design of personalized immunosuppressive treatments for kidney transplant recipients. This large-scale problem involves determining, under imperfect testing and limited budget, which markers, among thousands, require screening so as to maximize success rates of personalized treatment plans. The work not only incorporates potential treatment side effects such as toxicity, but also accounts for fairness towards specific population attributes, leading to less bias against certain subgroups.

In another recently NSF-funded project, he studies the evolution of illicit organ trafficking networks. Organ trafficking exhibits several notable differences from other more well-known trafficking networks, such as human and drug trafficking. Properties that are unique to organ trafficking include significantly higher profit per transaction and necessary involvement of highly skilled, often high-profile actors (physicians, lab technicians, etc.) and access to specific facilities/equipment. The work utilizes a combination of integer programming and agent-based simulation models in order to understand and predict how such networks start and evolve, in addition to the kinds of interventions that are required to optimally disrupt them.

Beyond the realm of healthcare, Hadi is interested in the computational efficiency in multivariate adversarial risk analysis models. These models pertain to decision making when there are intelligent opponents and uncertain outcomes. This research is on the intersection of statistical risk analysis and game theory and traditionally results in problems that are prohibitively hard to solve. The goal of this work is to develop sampling-based heuristic algorithms that converge to the true optimal decision in reasonable time.

Hadi’s work on robust blood screening, done in collaboration with the American Red Cross, was recognized through the Bonder Scholarship, was a Pierskalla Award finalist, and received second place in the IISE Pritsker Doctoral Dissertation Award.
Sze-chuan Suen is an assistant professor in the Daniel J. Epstein Department of Industrial and Systems Engineering at the University of Southern California. She received her PhD in the department of Management Science and Engineering from Stanford University in 2016. Her research interests include developing applied mathematical models to identify epidemiological trends and evaluate health policies to support informed decision-making. Her work in health policy modeling draws from a variety of techniques, including simulation, dynamic systems modeling, Markov decision processes, cost-effectiveness analysis, and decision analysis. Her previous work has examined the optimal management of tuberculosis, HIV, as well as chronic diseases. She has been a recipient of the INFORMS Pierskalla Best Paper Award and a finalist in the Junior Faculty Forum Paper Competition.

In her recent work, Sze is focusing on how to improve health systems to account for patient behavior. One such project focuses on designing optimal incentives to encourage patients to adhere to long antibiotic regimens given limited resources. These programs may be justified given the large negative externalities associated with drug non-adherence (transmission and development of anti-bacterial resistance). She is currently working with partners in Asia to better characterize patient utility functions with respect to tuberculosis medication adherence and incentives. In another current work, she is examining how HIV transmission patterns can influence disease spread and subvert or enhance health policy efforts. Together with researchers in public health and the Los Angeles County Department of Public Health, she is developing techniques to optimize resource allocation for HIV prevention using tools from simulation and optimization.
Health Applications Society Officers

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Ebru Bish (Past President)
Sze-chuan Suen (Treasurer)
Hadi El-Amine (Secretary)
Hui Zhao (Communications & Outreach Coordinator)
Jagpreet Chhatwal (Council Member)
Anahita Khojandi (Council Member)
Osman Ozaltin (Council Member)
TBD (Student Liaison)
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Ebru Bish (President)
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Lisa Maillart (Past President)
Mariel Lavieri (Treasurer)
Jacqueline Griffin (Secretary)
Hui Zhao (Communications & Outreach Coordinator)
Jagpreet Chhatwal (Council Member)
Anahita Khojandi (Council Member)
Osman Ozaltin (Council Member)
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