informs DECISION ANALYSIS SOCIETY

DECISION ANALYSIS TODAY

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The newsletter of the INFORMS Decision Analysis Society

Inside:

President's Letter

J. Eric Bickel

Dear DAS Members,

It is with a heavy heart that I write my final letter as president of the DAS. As my term began in 2014, we had just celebrated the 50th anniversary of decision analysis with a wonderful gala event in San Francisco. There, we honored Profs. Howard Raiffa and Ron Howard. Today, as my term approaches its end, we mourn Howard Raiffa's passing.

I only knew Howard from afar but was fortunate enough to spend time with him in San Francisco. I am thankful that the members of the DAS were able to show our appreciation for his many contributions.

I am not qualified to memorialize Howard Raiffa and entrust that solemn duty to his former students and close friends. I can only say that meeting him was an honor and I thank him for the kindness that he showed to me.

Howard's former student, and DAS Past-President, Jeff Keisler has written a wonderful memorial and included it in this newsletter. Jeff will also chair a session celebrating Howard's life at the INFORMS Annual Conference in Nashville (November 14, 1:30-3:00 P.M.). In addition, the current issue of *Decision Analysis* contains tributes to Howard by Ralph Keeney and David Bell.

As I review this issue of *Decision Analysis Today*, I am filled with gratitude and pride. So many people make the DAS a wonderful society! Please read the current issue carefully. Read about our great publications, our wonderful students, and all the ways that we are helping improve decision making around the world. Read about our award winners, including the 2016 Ramsey Medalist, Prof. Vicki Bier. Review the sessions at the upcoming DAS track in Nashville. Please read the position statements of the outstanding individuals that are running for DAS President and the DAS Council (and vote).

Most importantly, please join me in thanking the editorial team that puts this newsletter together, the DAS volunteers that chair our awards, the DAS officers that manage the society, and those that organize our conferences. There are dozens of people that make this society work and am grateful for their dedication and support.

It has been an honor to serve as DAS President and I look forward to seeing you in Nashville!

My warmest regards,

Eric Bickel

The University of Texas at Austin

Letter from the Editors

Debarun Bhattacharjya and Cameron MacKenzie

Dear reader,

We were deeply saddened at the passing in July of one of the founders and luminaries of decision analysis—Howard Raiffa. In a special column, Jeff Keisler reflects on Raiffa's monumental contributions to decision analysis as well as to other fields such as game theory, statistics, and negotiation. His passing reminds us that we are proud to be part of a community of people who are inter-connected through their professional backgrounds and interests as well as personal friendships; it also reminds us of the profound impact one can have on the world, and Raiffa's achievements will always remain an inspiration.

Just as elections are coming up in the United States, it is also time for the DAS elections. We have two excellent candidates for president: Karen Jenni and Gilberto Montibeller. Additionally, there are four candidates for DAS council: Mehmet Ayvaci, Saurabh Bansal, Heather Rosoff, and Matthias Seifert. You will find all the position statements and bios in this newsletter. Please be sure to vote (for all relevant elections!) – you will receive instructions from INFORMS in that regard soon.

The INFORMS Annual Meeting will be held from November 13-16 in Nashville. You will find the schedule for the DAS cluster in the newsletter, and we encourage you to make plans to attend the meeting if you have not done so already. Thank you to the co-chairs—Melissa Kenney, Andrea Cadenbach, Frank Koch, and Greg Hamm—for their efforts in putting together what promises to be an excellent conference. Also, congratulations to Vicki Bier, the recipient of the Ramsey Award! She will receive her award at INFORMS, as will the winners of the publication award (Amit Kothiyal, Vitalie Spinu, and Peter P. Wakker) and the student paper award (Qiushi Chen, Turgay Ayer, and Jagpreet Chhatwal).

We are excited to announce that Mavis Wang from Tsinghua University has joined the editorial team—she will be column co-editor for "DA Around the World" together with Matthias Seifert. The column features a review and several pictures of the INFORMS International Conference in Hawaii and the International Decision Conferencing Forum in Lisbon, Portugal. The "DA Practice" column by Larry Neal reprints a blog exploring new metrics for business originally written by Pat Leach. This newsletter also includes a wonderful summary of the recent Multi-criteria Decision Analysis / Decision Making Summer School held this past summer. Finally, the Society for Decision Professionals describes a recent webinar on the application of decision analysis in agriculture, and you can view a replay of the webinar as described in the column.

We thank all the column editors for their excellent contributions; the newsletter functions primarily due to their efforts. We welcome any suggestions about the newsletter—please feel free to send us a note if you have any ideas and thoughts for future issues.

Happy reading,

Cameron and Debarun

In Memoriam: Howard Raiffa

Jeff Keisler (jeff.keisler@umb.edu)

Howard Raiffa died peacefully on Friday, July 8, 2016 at the age of 92. Raiffa was the Frank Plumpton Ramsey Professor of Managerial Economics Emeritus at the Business School and the Kennedy School at Harvard University. He was both a towering intellect and a kind and good man, who inspired colleagues across many disciplines and organizations with his keen mind, ecumenical approach to academic research, and his generous spirit. Raiffa's intellectual and personal qualities persist in the many PhD students he advised (I was fortunate to be one) over his 40 years as a professor. Without him there would be no field of decision analysis as we know it. His work spanning over six decades continues to shape the field, through his mentorship of many leading researchers, and his own seminal publications.

Howard Raiffa
(1924 – 2016)

Along with his many honors in other fields, Raiffa was the first recipient of the Decision Analysis Society's Ramsey Medal, and was recently honored along with Ronald Howard at the celebration of the 50th Anniversary of the field of Decision Analysis, with the creation of the annual Raiffa-Howard Award.

Much has been written about his life and career. A list of tributes, biographical essays, and Raiffa's own writings is provided at the end of this essay. Within decision analysis, his impact is incalculable.

Raiffa had the mind of the mathematician and the heart of a coach. All his work aimed at helping people improve their performance, their lives, and the lives of others by incorporating better techniques. He referred to Decision Sciences as a comprehensive field which draws on a number of sub-fields and might aid decision makers and actors in all situations. Decision analysis is central to this vision.

As a student at the University of Michigan in the late 1940s, Raiffa focused on statistics and then became involved in game theory. In 1950, while analyzing the finitely repeated prisoner's dilemma game, he realized that for a player to decide what to do, it was necessary to assign subjective probabilities to the actions of the opponent. Of course, they were not called subjective probabilities at that time. In fact, to that point, there was no consideration of anything of the sort at all in game theory. This precursor to decision analysis provides a glimpse of Raiffa's creative process: he would think on a problem and from first principles find a simple new way of characterizing its key elements, and develop it from there, often drawing on something he had figured out in an adjacent field.

In the early 1950s, statisticians including Herman Chernoff, Herman Rubin, Bruno de Finetti, and Abraham Wald were pointing out philosophical weaknesses of classical statistics. Earlier thinkers such as Frank Knight and Frank Ramsey had already pointed toward approaches involving degrees of belief. Engaged in these discussions, Raiffa developed a convincing argument for Leonard Savage's formalization in which subjective beliefs are a necessary part of statistical inference. These beliefs could be treated perfectly well as probabilities and incorporated into calculations involving Bayes' rule.

Along with statistics, Raiffa continued his work in game theory through the 1950s, culminating in *Games and Decisions*, with R. Duncan Luce. While the book is still widely applauded as an updated and accessible treatment of John von Neumann and Oskar Morgenstern's work in the 1940s, one chapter in particular is essential to decision analysis. Individual decision making under uncertainty is conceived as a game against nature whose moves are random, so that utility functions are combined with probabilities in order to identify optimal strategies from the available "moves." Thus, while rational game players apply minimax decision rules, rational individual decision makers maximize expected utility. The writing has a sense of excitement that utilities and subjective probabilities are prescriptive necessities and not just arcane theoretical constructs, and that this approach could be valuable for real decision makers. This raised the question of how to obtain these inputs, setting in motion the search for reliable elicitation techniques (thereby spurring behavioral decision theory). Through the years, Raiffa was always cognizant of the gap between normative and descriptive approaches and saw prescriptive methods as the bridge.

Right after *Games and Decisions*, Raiffa took a joint appointment at Harvard University in the Statistics Department and the Business School. Raiffa had the highest esteem for Robert Schlaifer (the great R.O. Schlaifer, in Raiffa's words), with whom he developed the vision of taking basic ideas of decision tables, Bayes' rule and subjective probability into a rigorous Statistical Decision Theory which could offer better guidance for reaching inferences than could classical statistics.

Raiffa's notation and language for working with prior, preposterior, and posterior distributions of random variables enabled solutions for many decision problems—notably information acquisition decisions (based on value of information calculations) under many families of probability distributions, especially those from conjugate families. The results of this project appeared in *Introduction to Statistical Decision Theory* and *Applied Statistical Decision Theory*. The results here are still commonly used in decision analyses involving a mix of subjective and empirical data.

In explaining the ideas of statistical decision theory and decision making under uncertainty, Raiffa developed and formalized the decision tree (a variant of game trees). Decision trees turned out to be ideal for representing many real decision problems. As the statistical ideas were progressing, doctoral student C. Grayson Jackson was investigating problems faced by oil wildcatters. Raiffa worked with Jackson to use this as a realistic test case for a decision analysis involving decision trees, probabilities, and utilities. Although Raiffa's working style was independent and original, he was also open minded, and much of his work involves collaboration with partners from different backgrounds.

Encouraged by this success, Raiffa viewed decision theory transforming into a complete discipline of managerial economics. He taught a popular managerial course on decision making based on the decision making class, and he wrote *Decision Analysis: Introductory Lectures on Choice Under Uncertainty*. By this point he had some experience modeling decisions and had given much thought to the problems of how decision tree based analysis could work. Along with explaining decision trees, subjective probabilities and utilities, analysis, and so on, he also discussed the problems of elicitation (with some dialogues included—a device he would use again) and construction of the tree, and the process of interpretation of decision analytic results.

As *Decision Analysis* was widely adopted in courses, researchers and decision makers in fields from business to medicine to government took interest. In areas such as the latter, it quickly became clear that conflicting objectives were at play and Raiffa made initial progress on what to do about them. Fortuitously, Ralph Keeney was a student at MIT during the late 1960s and after encountering this work, he approached

Raiffa. Together they developed multi-attribute utility theory. In *Decisions with Multiple Objectives*, they formulated the mathematical approach, described potential methods for elicitation, calculation, and application to several problems, and illustrated the new methods in their study on the Mexico City Airport.

Around this time, Raiffa became a founder of Harvard's Kennedy School of Government and was also asked to represent the United States in the negotiations that created the International Institute for Applied Systems Analysis (IIASA), becoming its first director in 1972. This involved cooperating with stakeholders and governments who had vastly different interests. Naturally, he thought about how a rational party should act in such circumstances. He co-founded the Harvard Law School's Program on Negotiation in 1982 with Roger Fisher (whose *Getting to Yes* acknowledges a great debt to Raiffa). Shortly after, Raiffa's *Art and Science of Negotiation* mapped out problems, analytical techniques, and connections to applications, setting in motion the study of Negotiation as an applied technical discipline.

Through his career, Raiffa had a passion for clear exposition of important technical concepts in order to order to make them accessible and practical for a wide range of learners. His many classroom innovations included his much-loved set of audiographics (tapes, mimeographed scripts and examples, and spreadsheets) from which generations of Harvard students learned. He developed the first modern negotiation class in which students learned negotiations by actually negotiating. After his official retirement from Harvard 1994, he went on to teach and develop its freshman quantitative reasoning seminar—with a big dose of decision sciences. His 1999 book *Smart Choices* (with John Hammond and Keeney) explained the key ideas in decision analysis without the math, and brought those ideas—the PROACT method—to hundreds of thousands of readers.

Raiffa squared the circle in his last major book, *Negotiation Analysis: The Art and Science of Collaborative Decision Making*. Here, he considered the overall goal of using analysis to aid decisions. Whether there is one party involved in the decision or many, one objective or many, uncertainty or perfect information, the goal of the prescriptive analyst is to bring about better decisions. Any of these cases may require elicitation methods and mathematical representations of beliefs, values, and possible actions, and these largely are decision analytic. While in decision analysis, the main solution method is to roll back the decision tree, here, methods may or may not actually provide unique solutions, and the methods draw on a wider range of operations research techniques, such as integer programming. In this book and in some of his later autobiographical writing, Raiffa explained his vision of a decision science which in a sense generalizes decision analysis.

Raiffa's life's work brings together many fields, all of which he heavily influenced at the very least—game theory, statistics, statistical decision theory, behavioral decision theory, decision analysis, multi-attribute utility theory, and negotiation analysis. As a community, decision analysts looking at this body of work—the sophisticatedly interlinked machinery he created—can see where we are in the world because of him, where we fit, and what we owe him. We can identify problems Raiffa would have attacked if he had time, and which we can be confident are worth attacking because his sense of this was so perfect.

We are filled with gratitude for all of his work and his guidance, and offer our deepest condolences to his wife Estelle, his son Mark, his daughter Judy, and to his family and loved ones.

Resources

[Harvard Business School obituary](#)

[New York Times obituary](#)

[Washington Post obituary](#)

[INFORMS biography](#)

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Upcoming Conferences

October 5-October 6, 2016
European Decision Professionals Network
(EDPN) Conference
Copenhagen Business School
Copenhagen, Denmark
https://www.eiseverywhere.com/ehome/index.php?eventid=161908&

November 13-November 16, 2016
INFORMS Annual Meeting 2016
Music City Center & Omni Nashville
Nashville, Tennessee, USA
http://meetings2.informs.org/wordpress/nashville2016/

December 11-December 15, 2016
Society for Risk Analysis 2016 Annual Meeting
Sheraton San Diego
San Diego, California, USA
http://www.sra.org/events/sra-2016-annual-meeting

December 11-December 14, 2016
Winter Simulation Conference
Arlington, Virginia, USA
http://meetings2.informs.org/wordpress/wintersim2016/

February 23-February 27, 2017
The 6th International Conference on Operations
Research and Enterprise Systems
Porto, Portugal
http://www.icores.org/Home.aspx

April 2-April 4, 2017
INFORMS Conference on Business Analytics
and Operations Research
Las Vegas, Nevada, USA
http://meetings2.informs.org/wordpress/analytics2017

Nominations for DAS Positions

Candidates for President

Karen Jenni

Position Statement: The Decision Analysis Society and INFORMS have provided continuity and inspiration for me throughout my career as a decision analyst. I believe DAS has a particularly vital role to play right now, as our field evolves. We are transitioning from the founders to second and third generation decision scientists, from DA as a "specialty topic" studied deeply in a few academic programs to a wider reach in a range of academic programs, and from "concentrated" DA-focused consulting groups to a dispersed and diverse set of researchers and practitioners with both methodological and "subject-matter" interests. These transitions offer significant opportunities to expand the reach, contribution, and awareness of decision analysis. With that expansion it is even more critical that we continue to promote and recognize the traditions of excellence, collaboration, and camaraderie that mark the Society. I am honored to be able to offer my services in pursuit of these goals. I thank the Nominating Committee for the opportunity and the DAS members for considering me for the position as President-Elect.

I will have three primary areas of focus if elected: strengthen our core, increase our connections, and expand awareness of our field and contributions.

First, I want to acknowledge all the great work the DAS Council and leadership does simply as their ordinary business: keeping the second largest Society within INFORMS communicating and running smoothly, producing a great set of DAS sessions at the annual conference, recognizing outstanding practice, publications, and career contributions—none of these are trivial tasks, and all of them are part of the core of DAS. My goals here will be to continue the recent progress towards documenting and formalizing our current practices, and to increase our openness and welcoming of newer members, including students and those who have entered the field through less-traditional paths. If we can inspire new people to participate in DAS, we will continue to thrive in the future.

Current DAS leadership has highlighted their desire to foster more, better, and closer connections between the academic and practicing sides of our field. I share that desire and see many areas and ways in which we could connect better. For example: (a) within INFORMS, DAS is primarily "methods" focused, and many of our practitioners also participate in other applications-focused INFORMS Societies and Sections—we should continue and expand on our history of jointly sponsored talks and sessions; (b) there are several closely related professional societies with which we have a lot of overlapping interest and membership—including the Society of Decision Professionals (I currently sit on the Board of SDP), the Society of Risk Analysis, the Society for Medical Decision Making, and more—we should consider how to form closer relationships with those groups, through joint activities, co-located conferences, and so

forth; (c) the annual conference and bi-annual Advances conference provide great networking and social opportunities—we could make this a better experience for newer members by adding sessions or non-session activities aimed more specifically at those folks, perhaps leveraging INFORMS' new member breakfast and "isolated practitioner" events. All of these represent opportunities to identify great applications, and to identify interesting research questions and new areas of practice. The real challenge will be deciding what to do and engaging people in those activities. I'll be looking for ideas and help!

Finally, many of us are inspired by our work in part because of the positive impact we see it having. I think it is important to increase the visibility of our successes: both fundamental advances in understanding decision-making and practical successes in aiding decision-making. INFORMS recently highlighted a four new goals including one to "identify, recognize, and promote the work of our members to show the value their science and practice brings to society." Decision analysis research and applications often come with great stories and we should be a key part of these broader efforts to increase visibility—both contributing and leveraging the broader INFORMS efforts.

Biography: I joined the Science and Decisions Center at the U.S. Geological Survey in March of 2016. Previously, I studied math and computer science at Stanford, worked at Applied Decision Analysis, got my PhD in Engineering and Public Policy at Carnegie Mellon University, went back to ADA for a couple of years, moved over to more industry-specific decision consulting as a Principal at Geomatrix Consultants, and hung up my own "shingle" as Insight Decisions in 2005, focusing on decision analysis applications in the energy and environmental policy arenas. In addition to consulting work, I published a few papers, reviewed a few papers, and served for several years on the Geomatrix Board of Directors. Through this path one constant has been my involvement with INFORMS and DAS. It has provided a continuous community of interesting colleagues working on intellectually and organizationally challenging problems. DAS helped me stay connected to practice while I was in school, helped me keep up with research and advances while I was practicing, and helped me feel like part of a professional community while working as a sole practitioner. Over the years I have been a DAS newsletter columnist, a speaker, session chair, and cluster co-chair at INFORMS, and a DAS council member; I have chaired or served at least one time on every DAS Award Committee and I've made some great friends. It would be my pleasure and honor to serve the Society as President-elect, then President, then Past-President (Robin Keller said this was the best of the three positions—but you can't run for that one directly!).

Gilberto Montibeller

Position Statement: Dear colleagues, I am really honored to be nominated to run for Vice-President/President-Elect of our Decision Analysis Society.

Since I started my involvement with the DAS, almost a decade ago, I have always been very impressed by how our society provides an exciting and friendly environment for the exchange and development of ideas by researchers, practitioners, students, and junior and senior academics. The degree of commitment, enthusiasm, and energy shown by its members is something that I frankly admire.

So I always find a great pleasure in contributing to the society, which I have been

doing in several ways: as a session organizer in the DAS Cluster during the INFORMS annual meetings; as a member of the DAS Practice Award committee; as a member of the DAS Council; as a member of the editorial board of the *Decision Analysis* journal; and as a researcher publishing in the *Decision Analysis* journal.

The practical and scientific importance of Decision Analysis to the field of decision sciences is indisputable. In addition, our society has some key strengths that make us distinctive and strong. We are one of the largest societies in INFORMS, with a diverse membership of practitioners and academics, national and international members, senior and junior colleagues. Decision Analysis is indeed a truly multidisciplinary field and we embrace this conceptual diversity too: from developing axiomatic work to understanding behavioral aspects in eliciting judgments, from dealing with computational challenges to addressing socio-technical complexities.

For sure the most important thing that I learned in Decision Analysis, was Ralph Keeney's Value Focused Thinking. So here are my fundamental objectives for promoting the Decision Analysis Society if elected:

- **Further extend the links between academics and practitioners**. This will involve not only further developing connections with the Decision Analysis Affinity Group (DAAG) and the Society for Decision Professionals (SDP), but also more rigorous attempts of conceptualizing the practice of decision analysis, which can create research opportunities for academics and useful knowledge for practitioners. The divide between theory and practice is, in my view, rather artificial and my experience with the British Operational Research Society, which provides excellent links between practitioners and academics, will be valuable here.
- **Further increase the international diversity of our society**. I would like to explore my research connections in Britain, continental Europe, and Latin America to further increase the diversity of our community, bringing both new senior and junior members and increasing the gender balance. This has the dual benefit of promoting the fertilization of research ideas between Europe and the U.S. and bringing complex policy and decision problems to be analyzed (such as the challenging social and economic problems encountered in Latin America, for which Decision Analysis is of paramount value). Not to mention that such internationalization is a means to further growing the critical mass and influence of our society in INFORMS.
- **Extend the reach of our DAS conferences and INFORMS DAS Cluster**. This will encompass consolidating the Advances in Decision Analysis conference, for instance by bringing an even more international audience and, perhaps, hosting the conference in different continents in the future. Hosting joint conferences with sister societies, such as those dealing with risk analysis, multi-criteria analysis, or behavioral decision research, among others, is another exciting development. My involvement with several of these societies will facilitate such engagements. In addition, the further internationalization of the society could also help in making our INFORMS DAS Cluster even stronger than it is already.

I hope that my profile—as a full time academic who is often involved in practical applications and consultancy projects; as a researcher interested on the practical aspects of modelling; as a British-Brazilian who has worked in Latin America, Britain, Continental Europe, and the U.S.; as a scholar who enjoys teaching Decision Analysis to undergraduate, master, PhD students, and senior executives; and as a person who likes to engage with people and makes thing happen—could further contribute to the success and vitality of our society.

If elected it will be a pleasure to represent and promote the society nationally and internationally, coordinate all the activities related to the conferences, as well as develop new initiatives, such as the ones I mentioned above. I would like to continue the excellent work that Eric Bickel is doing as President and would be delighted to work closely with him, Jason Merrick, and Jeff Keisler.

I see the president's role as a facilitator, and would like to work closely with the officers and the council members—and will be open to ideas and suggestions from all members of the community—to develop and implement the strategies that make sure we continue having a strong, vibrant, and innovative society.

I hope you will decide to let me continue serving our society in this role.

Biography: I am a full Professor of Management Science at Loughborough University, and head of the Department of Management Science and Operations (one of the leading Management Science teams in Europe), and a Senior Visiting Fellow at the London School of Economics. I received my bachelors in electrical engineering from UFSC (Brazil), a masters in engineering economic analysis from UFSC and a doctorate in engineering economic analysis jointly from UFSC and the University of Strathclyde (UK). I then continued my studies as a post-doc fellow in management science at the University of Strathclyde. My main research interests are on the links between behavioral decision research and decision analytic modelling, and on the formal conceptualization of decision aiding practices.

I am area editor of the *Journal of Multi-Criteria Decision Analysis* and on the editorial boards of the INFORMS *Decision Analysis* and *European Journal of Decision Processes* journals. I have been publishing widely in in the field, in journals such as *Decision Analysis*, *Risk Analysis*, *European Journal of Operational Research*, among others. I have received several best publication awards, granted by the INFORMS Decision Analysis Society, the Society for Risk Analysis, and by the International Society on Multi-Criteria Decision Making.

I held visiting scholar positions at the Massachusetts Institute of Technology (MIT, U.S.), the International Institute for Applied Systems Analysis (IIASA, Austria), and the University of Southern California (U.S.). I was a visiting professor at CNRS Lamsade (Paris Dauphine University, France) and I am a visiting professor at the University of São Paulo (Brazil).

I have more than twenty years of experience in conducting decision analytic projects for private and public organizations, in Continental Europe, Britain, and South America. Client organizations include the World Health Organization (WHO), Food and Agriculture Organization of the United Nations (FAO), Babcock International, Itaipu Binational (Brazil and Paraguay), and the Brazilian Centre for SMEs (SEBRAE). Two of my main areas of applications are resource allocation against emerging threats, particularly health and terrorist ones, and multi-criteria health prioritizations. My hobbies are travelling, particularly riding my BMW motorcycle, and cooking Brazilian BBQs during the summer. I also support Brazil's soccer team, despite their embarrassing recent performances.

Candidates for DAS Council

Mehmet Ayvaci

Position Statement: It is an honor to be nominated to run for the DAS council. Since taking my first decision analysis course from Prof. Ron Howard at Stanford, I have always been amazed by the extent of opportunities in applications of decision theory in many areas. Working in consulting afterward, I found my passion in health-related decisions which then became my research and teaching interest. Over the years of collaboration with people from different disciplines and teaching to Masters and MBA students, I realized that the decision problems carrying the following characteristics will offer the most value to the decision makers: decisions that are relevant for individuals and organizations, decisions that are data-driven, and decisions that are made while consulting with domain experts. If I am elected to the office, I will work on

1. promoting the research and teaching of data-driven decision analytic methods
2. seeking opportunities for bringing the research community and healthcare organizations/practitioners together at the conferences DAS organizes or participates
3. strengthening the cross-society activities (such as with those involving health applications) to enrich the members' intellectual experience
4. developing activities and programs to attract PhD students to the society (and supporting those that already exist)

Biography: Mehmet Ayvaci is Assistant Professor of Information Systems and Operations Management in the Jindal School of Management at the University of Texas-Dallas. He earned his M.S. degree in Management Science & Engineering from Stanford University and a PhD degree in Industrial and Systems Engineering from the University of Wisconsin-Madison. Professor Ayvaci's areas of research broadly focus on clinical applications of decision theory and economics of health information/information sharing. Because of the interdisciplinary nature of his work, he has numerous publications in clinical and medical informatics journals on the broader subjects of cost-effectiveness, comparative effectiveness, medical decision making, and analytics in healthcare as well as publications in management and engineering journals. His research was recognized by Decision Analysis Society and Information Systems Society of INFORMS, and Workshop on Health Information Technology and Economics.

Saurabh Bansal

Position Statement: I am delighted to be nominated for the Decision Analysis Society Council, and would be honored to serve. I graduated from the doctoral program in Risk Analysis and Decision Making at The University of Texas at Austin in 2010. Since then I am housed at the Supply Chain Management department at The Pennsylvania State University. My transition is not unique. Indeed, this is a common experience of many young decision analysts graduating today: the number of institutions that specifically hire decision analysts has reduced; the course offerings on decision analysis at undergraduate and graduate level are also less common.

These changes provide us with both challenges and opportunities. The challenge is to continue to work on problems that are both appealing to us as decision analysts and contribute to our home departments. This is where the opportunity also exists: rich contextual areas with problems that motivate new theoretical developments in decision analysis and/or problems for which existing decision analytic approaches provide nuanced insights. In my own research, I have worked on production planning problems in which the production technology is new and its uncertainty must be estimated using expert-elicitation. I strongly believe that such domain-driven opportunities will make the DAS community more vibrant, and are a natural avenue for an organic growth in our membership. To this end, if elected, I plan to focus on three items.

- Create venues that provide a greater visibility to decision analysis applications in various domains and to application driven decision analytic theory. I am chairing a session at INFORMS 2016 showcasing examples of such works, and plan on continuing these efforts.
- Create new platforms such as discussion panels at INFORMS and ADA to discuss how decision analytic skills can be a part of curriculums in various disciplines.
- Reach out to researchers in other domains who use decision analysis tools and encourage them to become involved with DAS activities and developments.

Biography: Saurabh Bansal is an Assistant Professor of Supply Chain Management at Smeal College of Business at The Pennsylvania State University. He is also a faculty of the university-wide graduate program in Operations Research, and an affiliated faculty member for behavioral research lab at Smeal College of Business. His research focuses on (i) using experiments to describe how managers estimate, perceive, and react to business uncertainties, and (ii) using prescriptive models to suggest how they should react to these uncertainties. His recent research focuses on calibration of experts and the estimation of probability distributions using expert judgments, and the use of these distributions in solving operational problems at commercial firms in agribusinesses and in the electronic device industry.

Heather Rosoff

Position Statement: It is an honor to be invited to be a candidate for the DAS Council. DAS has played a significant role for me throughout my career and after "retiring" from my position as the *DA Today* newsletter editor, I would love to continue to have the opportunity to serve the community.

If elected to the DAS Council, I would seek to advance the visibility and reach of decision analytic methods and the DAS in the following ways:

(1) As a policy analyst by training, I am committed to bridging the gap between theory and practice. DAS has a great record of enabling the exchange of ideas and experiences among those engaged in Decision Analysis. I believe it is important for community members to share their lessons from research and applied experiences; however, equally important is communicating about what is most needed to further the appreciation of the value-added of our field. I think this dialogue is important to sustain and expand upon through new approaches for education, collaboration and communication among researchers and members of the public and private sectors.

(2) I would like to work with the editors of the *DA Today* newsletter to expand upon the existing material and format to enrich the shared research contributions among members within the field, improve upon endeavors for advising students and early career DAS members, and increase readership among those already within the community as well as draw new readers.

(3) Building on efforts to improve DAS membership, I would like to work on attracting new members unaware of the potential application of decision analysis to their respective fields of interest. A good start in this area would be to reach out to other INFORMS societies and encourage their members to take advantage of DAS conference sessions and networking events. Additionally, the Council might consider establishing additional forums, both Web-based and region specific to encourage ongoing communication and discussion of needs and emerging ideas.

Thank you again for your nomination.

Biography: Heather Rosoff is a Research Assistant Professor in the USC Sol Price School of Public Policy and Research Assistant Director for USC's National Center for Risk and Economic Analysis of Terrorism Events (CREATE). Her research focuses on using risk and decision analysis to study terrorism and homeland security. Her recent research has focused on evaluating the perceived risk relationships across disaster characteristics and predicting public behavioral responses to an event (including cyber events), and on studying the terrorist threat from the adversary perspective and integrating terrorist challenges and vulnerabilities into policy making. Rosoff received her PhD in public policy and MS in Systems, Safety and Security from the University of Southern California in 2009.

Matthias Seifert

Position Statement: Hello and thank you very much for nominating me as a candidate for this year's DAS Council elections! It would be my absolute pleasure to serve on this important committee and help the Decision Analysis Society in expanding its reach and impact. The Decision Analysis Society has been my academic home for quite a few years by now and, as such, I have been actively involved by serving on the editorial board of our Society's flagship journal (since 2010), by editing the "DA Around The World" column in our quarterly society newsletter (since 2010), and by contributing to several paper award and steering committees (2013, 2014, 2015).

The three topics that lie closest to my heart, if given the opportunity to be part of this committee, revolve around (1) improving the international outreach of DAS, (2) exploiting opportunities of collaboration between the Society and adjacent communities such as behavioral operations and behavioral economics and (3) improving the visibility/marketability of current doctoral students in our Society.

(1) International Outreach:

In my role as a column editor in *DA Today*, I have been committed to raising the awareness of local decision analysis communities around the globe. I have thereby had the chance to write about and interact with decision analysts in Sweden, Spain, Taiwan, Brazil, the UK, the Netherlands, Turkey, and Germany. During this process I have discovered that there are many exciting local DA networks, which, however, tend to be fairly decentralized and could therefore benefit from a better integration in the INFORMS DAS community. Hence, I believe that it would be a great opportunity to put the integration of local DA communities on the strategic agenda of the Society.

(2) Integration of DAS with adjacent fields

Due to the recent growth of adjacent academic fields such as Behavioral Operations and Behavioral Economics, I believe that there exists an opportunity to learn from each other in terms of the methodological approaches employed, topics researched, and practitioner insights generated, which could help the DA Society as a whole to evolve. I think this can particularly be achieved by organizing more joint sessions with these sub-communities at our INFORMS meetings as well as by exploring the possibility of establishing reciprocal agreements between INFORMS sub-communities, which allow us to showcase case studies and research projects that lie at the intersection of both fields on a regular basis (e.g.. in each society's newsletter).

(3) Improving the visibility/marketability of our doctoral students

In the last few years I have noticed an information gap between the doctoral candidates that form part of our Society and the schools that offer DA-related faculty positions. Having been on a number of faculty search committees myself, I know how difficult it is to identify suitable DA candidates, and I think a better job could be done by us to match institutions and students. This could, for example, be done by organizing specific career guidance sessions at INFORMS and/or dedicating some space in our newsletter to specifically introduce candidates on the market.

Biography: I am a German national and am currently working as a tenured Associate Professor of Decision Sciences in the Operations & Technology Department at IE Business School in Madrid, Spain since 2009. Before IE, I had been spending most of my academic life in the United Kingdom, where I was affiliated to the London Business School, the London School of Economics and Political Sciences as well as the University of Cambridge.

My research focuses on issues such as individual and group decision making under risk and uncertainty, managerial forecasting and multiattribute choice models. In the past I was fortunate to be a recipient of the EFMD/Emerald Outstanding Doctoral Research Award, the Toby Jackman Prize for the most outstanding dissertation in any discipline awarded by St Edmund's College, Cambridge University, as well as various other research awards granted by institutions in Germany, the United States, Spain and the United Kingdom. I currently serve on the editorial boards of and/or have published in journals such as the *Journal of Operations Management*, *Organizational Behavior and Human Decision Processes*, *Decision Analysis*, *Personality and Social Psychology Bulletin*, *Harvard Business Review*, and *MIT Sloan Management Review* among others.

My work has been featured by public media including Forbes India, Ideas for Leaders, CBS News, the Financial Times International ("Professor of the Week"), Psychology Today and others. More recently, I have been included in the 2016 list of the "Best 40 Under 40 Business School Professors" published by Poets & Quants.

INFORMS 2016 DAS Cluster

Decision Analysis Society Cluster at the 2016 INFORMS Meeting in Nashville, TN

The INFORMS 2016 Annual Meeting will be held in Nashville from November 13-16, 2016. The DAS Track will feature a wide range of sessions and talks focused on the practice and theory of decision analysis including portfolio decision analysis, decision analysis applications (e.g., environment, health, security, business, etc.), multi-criteria approaches, behavioral decision making, expert elicitation, and decision analysis in supply chain operations. The *Howard Raiffa: Celebration of His Life and Achievement, Decision Analysis Awards Session,* and *Decision Analysis Business Meeting* all on November 14 will be the highlight of the conference. We look forward to seeing you in Nashville!

-- DAS Conference Chairs: Melissa Kenney, Andrea Cadenbach, Frank Koch, and Greg Hamm.

Nashville, TN | November 13-16, 2016

Sunday, November 13

	Room TBD	Room TBD
8:00-9:30 A.M.	*Military Applications of Decision Analysis*; Chaired by Gregory Parnell, University of Arkansas (SA43)	*Applications of Decision Analysis to Natural Resource Management*; Chaired by Karen Jenni & Michael Runge, US Geological Survey (SA44)
11:00-12:30 P.M.	*Systems Engineering and Decision Analysis*, Chaired by Robert Bordley, Booz Allen Hamilton (SB43)	*Decision Analysis, Game Theory, and Homeland Security*; Chaired by Jun Zhuang & Jing Zhang, University at Buffalo SUNY (SB44)
1:30-3:00 P.M.	*Spatial Risk and Decision Analysis*; Chaired by Gilberto Montibeller, Loughborough University (SC43)	*Modeling of Uncertainty and Preference in Decision Analysis*; Chaired by Christopher Hadlock, The University of Texas at Austin & Robert Hammond, Chevron (SC44)
4:30-6:00 P.M.	*Values and Decision-Making*; Chaired by Johannes Siebert, University of Bayreuth (SD43)	*Robust Decision Analysis*; Chaired by Erin Baker, University of Massachusetts-Amherst (SD44)

Monday, November 14

	Room TBD	Room TBD
8:00-9:30 A.M.	*Decision Analysis, Game Theory, and Disaster Management I*; Chaired by Jun Zhuang & Jing Zhang, University at Buffalo SUNY (MA43)	*Environmental Decision Analysis*; Chaired by Melissa Kenney, University of Maryland (MA44)
11:00-12:30 P.M.	*Applied Decision Analysis*; Chaired by Saurabh Bansal, Penn State University (MB43)	*Panel: Advice from Award Winning Researchers*; Chaired by Andrea Hupman Cadenbach, University of Missouri-St. Louis (MB44)
1:30-3:00 P.M.	*Decision Analysis Arcade I*; Chaired by Joshua Woodruff, (MC43)	*Howard Raiffa: Celebration of His Life and Achievement*; Chaired by Jeffrey Keisler, University of Massachusetts-Boston (MC44)
4:30-6:00 P.M.	*DAS Awards Session*; Chaired by Eric Bickel, The University of Texas at Austin (MD44)	

Tuesday, November 15

	Room TBD	**Room TBD**
8:00-9:30 A.M.	*Data-Driven Decision Making*; Chaired by Hiba Baroud, Vanderbilt University (TA43)	*Investment Analysis and Financial Applications*; Chaired by Manel Baucells, University of Virginia Darden School of Business (TA44)
11:00-12:30 P.M.	*New Frontiers in Decision Analysis Practice and Theory*; Chaired by Franklyn Koch, Koch Decision Consulting & Melissa Kenney, University of Maryland (TB43)	*Graphical Methods*; Chaired by Jeffrey Keisler, University of Massachusetts-Boston Keisler (TB44)
1:30-3:00 P.M.	*Decision Making in Public Policy*; Chaired by Cameron MacKenzie, Iowa State University (TC43)	*Decisions, Sensitivity and Applications*; Chaired by Emanuele Borgonovo, Bocconi University (TC44)
4:30-6:00 P.M.	*Portfolio Decision Analysis*; Chaired by Janne Kettunen, The George Washington University (TD43)	*Applications of Multiattribute Preferences*; Chaired by Jay Simon, American University (TD44)

Wednesday, November 16

	Room TBD	**Room TBD**
8:00-9:30 A.M.	*Spreading Decision Competencies*; Chaired by Chris Spetzler, Decision Education Foundation (WA43)	*Environmental and Water Resources Decision Analysis*; Chaired by Fengwei Hung & Liang Chen, Johns Hopkins University (WA44)
11:00-12:30 P.M.	*Decision Making with Incentives*; Chaired by Andrea Hupman Cadenbach, University of Missouri-St. Louis (WB43)	*Behavioral Decision Analysis*; Chaired by Matthias Seifert, IE Business School (WB44)
12:45-2:15 P.M.	*Information Elicitation*; Chaired by Majid Karimi (WC43)	*Strategic Management Decision Making*; Chaired by Dharma Kwon, University of Illinois at U-C (WC44)
2:45-4:15 P.M.	*Decision Analysis, Game Theory, and Disaster Management II*; Chaired by Jun Zhuang & Jing Zhang, University at Buffalo SUNY (WD43)	*Advances In Risk Modeling Theory*: *Nonlinear Systems*; Chaired by Ghorbanmohammad Komaki & Behnam Malakooti, Case Western Reserve University (WD44)
4:30-6:00 P.M.	*Decision Analysis Arcade II*; Chaired by Alba Rojas, Virginia Tech (WE43)	*Perceptions, Behavior, and Decisions*; Chaired by Franklyn Koch, Koch Decision Consulting & Gregory Hamm, Stratelytics, LLC (WE44)

Award Announcements

Ramsey Award

The Frank P. Ramsey Medal is the highest award of the DAS. It was created to recognize distinguished contributions to the field of decision analysis. The medal is named in honor of Frank Plumpton Ramsey, a Cambridge University mathematician who was one of the pioneers of decision theory in the 20th century. His 1926 essay "Truth and Probability" (published posthumously in 1931) anticipated many of the developments in mathematical decision theory later made by John von Neumann and Oskar Morgenstern, Leonard J. Savage, and others.

For this award, decision analysis is defined as a prescriptive approach to provide insight for decision making based on axioms that are logically consistent with the axioms of von Neumann and Morgenstern and of Savage. Key constructs of decision analysis are utility to quantify one's preferences and probability to quantify the state of one's knowledge. There are overlapping aspects of decision analysis with other fields such as behavioral decision research, probabilistic risk analysis, and engineering and economic analyses.

Behavioral decision research addressing how people make decisions that has direct implications for improving the practice of decision analysis is a contribution to decision analysis. Models of uncertain possible consequences from scientific, engineering, and economic modeling that are useful for decision analysis are contributions.

Distinguished contributions to the field of decision analysis can be internal, such as theoretical or procedural advances in decision analysis, or external, such as developing or spreading decision analysis in new fields. Thus, the specific award criteria for evaluating potential Ramsey Medal recipients are a candidate's

- Theoretical, methodological, and procedural contributions to decision analysis
- Applications of decision analysis (including new uses and in new fields)
- Other contributions promoting decision analysis (e.g. educational and public awareness)
- Exceptional contributions to the DAS (e.g. service to society or journal)

A potential recipient need not meet all of the criteria, but contributions to each criterion are pertinent.

Prof. Vicki M. Bier has been selected to receive the 2016 Frank P. Ramsey Medal.

Prof. Bier has been and continues to be a consistent contributor and leader to the field of decision analysis, including serving in leadership positions in the Decision Analysis Society of INFORMS and in a variety of other leadership roles. She served on the Decision Analysis Society of INFORMS council from 1998 to 2001, and then as President-Elect, President, and Past President from 2008 to 2014, among many other contributions. Dr. Bier came to decision analysis by way of risk analysis. Her ability to bridge these two closely related fields has been to the great benefit of both. She is a Fellow of the Society of Risk Analysis, and received that organization's Award for Distinguished Achievement, as well as serving on its council and as Engineering Editor for its flagship journal. She has also served on numerous panels, working groups and committees promoting the broad and correct application of decision and risk modeling in important settings including nuclear safety and risk-benefit analyses.

Vicki Bier has spent most of her academic career at the University of Wisconsin, where she is currently Professor of Industrial and Systems Engineering and of Engineering Physics. She earned her B.S. in Mathematical Sciences from Stanford University in 1976 and her PhD in Operations Research from MIT in 1983.

Upon receiving her doctorate she joined Pickard, Lowe & Garrick, where she led risk analyses, particularly in the nuclear industry, building on earlier consulting experience with Arthur D. Little. Her efforts on Bayesian methods in risk assessment led to a number of innovative publications. In 1989, she joined the University of Wisconsin as an assistant professor. Since 1996, she has directed the Center for Human Performance and Risk Analysis. She became full professor in 2001, and she served as chair of the Industrial and Systems Engineering Department from 2011 until this year. In the course of her time at Wisconsin, she has also supervised sixteen doctoral dissertations (and counting), and her students are also making an impact on the field.

With the analytical mind and the practical mindset Prof. Bier brings to her research, she provides rigorous answers to problems of great societal importance and impact. Early in her career, she focused on nuclear safety and reliability modeling. More recently, she has focused on problems of security and counterterrorism. She has well over 100 research publications, including four books and edited volumes and more than 60 journal articles. Her highly cited work combines risk analysis and game theory with decision analytic modeling, and lays a theoretical foundation for decisions regarding the allocation of defensive resources. Her work has also focused on creating sound methods for eliciting and synthesizing judgments in challenging situations.

This award recognizes Prof. Vicki M. Bier's leadership, intellectual and practical contributions to decision analysis and closely related fields.

The Ramsey Medal award committee for 2016 was Jeff Keisler (Chair), Karen Jenni, Don Kleinmuntz, Jim Smith, and Detlof von Winterfeldt.

DAS Publication Award

On behalf of the Publication Award Committee, I am happy to announce the winner of this year's Publication Award for the best decision analysis paper or book published in 2014.

Publication Award Winner

"[Average Utility Maximization: A Preference Foundation](#)," Amit Kothiyal, Vitalie Spinu, and Peter P. Wakker, 2014, Vol 62, No 1, 207-218, *Operations Research*.

Please join me in congratulating Amit, Vitalie, and Peter. I also recommend that you go and read the paper. It is important work and represents the best in our field. This award includes an honorarium of $750 and a plaque. The award will be presented at the Decision Analysis Society's Awards Session at the INFORMS Annual Meeting to be held in Nashville, Tennessee, on November 14, 2016. The winners are invited to present their paper in that session.

I would also like to announce two finalist papers. These two papers are excellent as well and are worth the read.

Publication Award Finalists

"[The Wisdom of Select Crowds](#)," Albert E. Mannes, Jack B. Soll, and Richard P. Larrick, 2014, Vol 107, No 2, 276-299, *Journal of Personality and Social Psychology*.

"[CUT: A Multicriteria Approach for Concavifiable Preferences](#)," Nikolaos Argyris, Alec Morton, and Jose Rui Figueira, 2014, Vol 62, No 3, 633-642, *Operations Research*.

I would like to thank the members of the committee for their careful reading and deliberation. The members of the committee were Jim Smith, Kevin McCardle, Enrico Diecidue, Alec Morton, and Max Henrion. In total, we considered 29 papers, which were judged for significance, relevance, originality, and readability.

Sincerely,
Casey Lichtendahl
Publication Award Committee Chair

DAS Student Paper Award

The Student Paper Award is given annually to the best decision analysis paper by a student author, as judged by a panel of the Decision Analysis Society of INFORMS. Students who did not complete their PhD prior to May 1, 2015 were eligible for this year's competition.

The award is accompanied by a plaque and a $500 honorarium. The award will be presented and the winner will also be invited to present his or her paper at the DAS Awards Session at the INFORMS Annual Meeting to be held in Nashville, Tennessee, on November 14, 2016.

The publications committee for this year included Emanuele Borgonovo (Co-Chair), Robert Hammond (Co-Chair), Yael Grushka-Cockayne, Eric Johnson, Victor Jose, and Asa Palley. We received 20 submissions this year, all of which were of a really outstanding quality and award deserving.

It is our pleasure to congratulate the winners of this year's publication award:

"Optimal Liver Cancer Surveillance in Hepatitis C-Infected Population," by Qiushi Chen, Turgay Ayer and Jagpreet Chhatwal.

The publication award committee would also like to recognize two papers as finalists:

Venkata R. Prava, Robert T. Clemen, Benjamin F. Hobbs, Melissa A. Kenney, 2016: "Partition Dependence and Carryover Biases in Subjective Probability Assessment Surveys for Continuous Variables: Model-based Estimation and Correction," *Decision Analysis*, 13(1):51-67

and

Sasa Zorc, Ilia Tsetlin, 2016: "Be Patient Yet Firm: Offer Timing, Deadlines, and the Search for Alternatives"

We have been honored to serve as the 2016 co-chairs of the DAS Student Publication Award. We would also like to thank the distinguished committee members Yael Grushka-Cockayne, Eric Johnson, Victor Jose, and Asa Palley.

Sincerely,

2016 DAS Student Paper Award Committee Co-Chairs:
Emanuele Borgonovo
Full Professor, Bocconi University, Milan, Italy

Robert Hammond
Decision Analyst, Chevron

MCDA/M Summer School Summary

Danielle C. Morais (dcmorais@cdsid.org.br) and **Luciana H. Alencar** (alencarlh@gmail.com)

DAS in Recife throughout MCDA/M Summer School 2016

The 12th MCDA/M Summer School, an event first held 33 years ago, took place in Recife-Pernambuco, Brazil, from July 18-29, 2016.

The aim of such MCDA/M Summer Schools is to provide a forum on the state-of-the-art of multiple criteria methods, which includes among others, the Decision Analysis prescriptive approaches based on axioms that are logically consistent with the axioms of von Neumann and Morgenstern and of Savage in order to provide insight for decision making.

The scientific program of the summer school consisted of lectures from guest speakers and discussions of case studies in working groups (see http://cdsid.org.br/mc-summer-school2016/program/).

Along the event these PhD Students had 26 guest lectures (90 minutes each), 14 casework sessions (also 90 minutes each), and 5 different case studies. The topics covered:

- An Introduction to MCDA/MCDM (Danielle C. Morais and Roman Słowiński)
- Applications in real world problems (Adiel T. de Almeida)
- Value-Focused Thinking (Ralph Keeney)
- Problem Structuring (Ralph Keeney)
- Preference Modelling (Salvatore Greco)
- Outranking Methods (José Rui Figueira)
- MAVT/MAUT (Adiel T. de Almeida and Danielle C. Morais)
- Robust Ordinal Regression (Salvatore Greco)
- Decision Rule Approach (Roman Słowiński)
- MCDM Group Decision (Adiel T. de Almeida and Danielle C. Morais)
- Multi-objective Optimization (José Rui Figueira)
- Interactive Methods of Multi-objective Optimization (IMMO) (Murat Köksalan)
- Multi-objective Combinatorial Optimization (MOCO) (Matthias Ehrgott)
- Evolutionary Multi-objective Optimization (EMO) (Carlos M. Fonseca)
- Biases in Decision Making (Murat Köksalan)

- Fuzzy Modelling in MCDM Problems (Petr Ekel)
- Decision Deck (Milosz Kadzinski)
- "Meet the editor": Scientific writing and strategies of publications (Roman Słowiński)

To increase and exploit the entropy among participants and to enable them to take full advantage of opportunities to form strong networks, a student poster session was organized, which allowed the PhD students to advertise their work and interact with each other regarding their ongoing research. This session also saw to it that students could receive positive feedback both from experienced lecturers and student colleagues. During the first four days of the Summer School, 38 posters were presented.

All lectures were thought-provoking, attractively presented, well-attended, and highly appraised by students, so much so that the preference relation with respect to the lectures far exceeded the allure of the

attractions of and on the sun-bathed beach less than a stone's throw away from the venue! For such a noteworthy outcome, we are extremely grateful to all colleagues who contributed to ensuring the scientific program was so outstanding and received such high assessment ratings and spontaneous praise in feedback from participants. In first name alphabetical order, these colleagues were: Adiel T. de Almeida, Carlos M. Fonseca, Danielle C. Morais, José Rui Figueira, Martin J. Geiger, Matthias Ehrgott, Milosz Kadzinski, Murat Köksalan, Petr Ekel, Ralph L. Keeney, Roman Słowiński, Salvatore Greco, and Sandra Huber.

The guest lectures were complemented with five different case studies. This coursework led to really interesting and well-crafted group presentations at the end of the school.

During the weekend, a social activity and banquet were held on Sunday, July 24. We also made an excursion to the Brennand Factory and Studio and the Ricardo Brennand Institute. The Brennand Factory and Studio is an architectural ensemble and sculptural garden of great originality which exhibits a huge collection of ceramic art (a great variety of sculptures and paintings) produced by Francisco Brennand, an internationally renowned sculptor from Pernambuco. The Ricardo Brennand Institute is a museum where Summer School participants saw the world's largest collection of paintings by Frans Post, who was the first major artist to paint scenes of the colonial Brazil of the early-mid 17th century. This Institute holds a permanent collection of historic and artistic objects of various provenances and one of the largest collections of armory in the world, around 3,000 pieces. After the excursion, we held the banquet at Spettus Steak House (Boa Viagem), a traditional Brazilian Barbecue Restaurant. During the banquet, one of the most spectacular moments of the Summer School took place: all participants, without exception, became instant specialist dancers of samba and frevo to the sound of live music. It was the apogee of the integration of all participants and lecturers, really fantastic! (see photos and videos at http://cdsid.org.br/mc-summer-school2016/photos/).

Almost 90 students applied for the Summer School of whom 50 were selected and 46 registered. The participants came from 17 countries. 60% were from Europe (countries represented were Austria (3 delegates), Belgium (1), Finland (1), Germany (1), Hungary (1), Italy (3), Netherlands (4), Norway (1), Poland (1), Portugal (4), Spain(3), Turkey (3)), 27% from Brazil (12 delegates), 7% from Mexico (3 delegates), 4% from India (2 delegates), 2% from the U.S. (1 delegate). All participants received a certificate of completion stating the credits accomplished, signed by the Dean of Research and Post-

Graduate Program and the Director of the Post-Graduate Program of Management Engineering of the Federal University of Pernambuco.

On the occasion of this MCDA/M Summer School, we organized a parallel event (Seminar of Information and Decision System) held at the Federal University of Pernambuco (UFPE) where the Lecturers gave Plenary Sessions that were open to the general public. We would like to express our gratitude to all Lecturers for this extra effort that helped us greatly to obtain additional financial support for the Summer School. Our sincere gratitude is due to the Scientific Committee for the constant support to the organizing committee, since the very beginning, and, of course, to all those on the organizing committee. This Summer School would not have been possible without the support of many people. We are also very grateful to our sponsors, namely CAPES, CNPQ, FACEPE, PRONEX, INSID and the International Society on Multiple Criteria Decision Making (supporting the registration with accommodation of 14 students).

EDPN Conference Announcement

Kuno Huisman (kuno. huisman@asml.com)

Please join the European Decision Professionals Network (EDPN) conference in Copenhagen—Oct 5-6!

The two-day conference program consists of a mix of inspiring presentations and an interactive program.

The conference program is built on four main themes:

- How can we address "complexity." for example of the business environment?
- How can we keep clarity of thought in this world of overwhelming information?
- How do we properly take risks and uncertainties into account when making investment or strategic decisions?
- What support do executives need for truly effective and efficient decision making?

Speakers and participants with backgrounds in oil and gas, high tech, pharmaceutical, fast-moving consumer goods, and other industry sectors, as well as policymakers and scientists are invited to the conference.

We are pleased to announce that we have been able to secure the following speakers:

- Claus Due Ponsaing, Global Business Analysis, Lundbeck
- Melanie Kreye & Joana Geraldi, Assistant Professors, DTU Management Engineering
- Kuno Huisman, Head of Business Change and Decision Support, ASML
- Ada Rieker, former Statoil VP Exploration and Valuation and Founder of DecisionNodes AS
- Professor Joerg Rieskamp, Professor Economic Psychology, University of Basel
- Paul Rudenko, Innovation and R&D Planning Manager, Shell
- Michael Seewald, VP and Global Head of Real World Evidence, Novartis
- Florian Wagener, Associate Professor Mathematical Economics, Amsterdam School of Economics
- Bart Willigers, Economist Manager, BG Group

We are confident that these speakers and their presentations will stimulate a discussion and a type of interaction that is valuable to you. In addition, the conference is organized in collaboration with the Copenhagen Business School (CBS). A CBS speaker will be confirmed soon.

You may register for the conference online on: www.eiseverywhere.com/EDPN. We look forward to seeing you in Copenhagen!

Decision Analysis <u>September</u> 2016 Issue

Long-Term Care Insurance Decisions

Samuel E. Bodily and Bryan Furman

Abstract: The purchase of long-term care (LTC) insurance is a difficult lifetime choice made in the face of highly uncertain risks, including mortality, morbidity, timing and length of LTC, and portfolio investment risk. Many individuals do not know how to think about this decision properly and, in the face of too much anecdotal and too little objective information, will not proactively decide. We used Monte Carlo simulation modeling with detailed, experience-based distributions for LTC uncertainties and their correlations to project investment growth to death given alternative levels of LTC insurance. Using constant risk aversion, we calculate certainty equivalents for the resulting distributions of final holdings at death. Decisions were separated for male and female individuals and group and individual market insurance opportunities. Sensitivity analysis was conducted varying age, cost of coverage, starting investment amount, risk tolerance, return on portfolio investment, inflation, and length of LTC coverage. Optimality results suggest low levels of coverage or no insurance, with higher use of insurance only for individuals who are young, have low risk tolerance, low starting portfolio amounts, or combinations of these characteristics. While the contribution of this work is to assist individual decision making, it will also be informative to policy makers and insurance companies.

For more: <u>http://dx.doi.org/10.1287/deca.2016.0332</u>

Equilibrium Notions for Agents with Cumulative Prospect Theory Preferences

Kerim Keskin

Abstract: Relying on the experimental findings that actual choice behavior often violates the axioms of expected utility theory (EUT), we study non-EUT preferences in a noncooperative game-theoretic framework. In particular, agents' preferences are represented by the pair of functions suggested in cumulative prospect theory (CPT). Accordingly, three key aspects of CPT are incorporated: subjective probability weighting, loss aversion, and reference dependence. We introduce a correlated equilibrium and two mixed strategy equilibria for agents with CPT preferences. We prove the existence of equilibria for finite normal form games and investigate the sets of equilibria in some examples.

For more: <u>http://dx.doi.org/10.1287/deca.2016.0333</u>

On The Positive Expected Utility of Combination Wagers

Babatunde Buraimo, David Peel, and Rob Simmons

Abstract: We demonstrate that a utility maximizing individual with an everywhere concave utility function may optimally wager on two or more outcomes in an event even though the expected returns to a unit stake are negative on all outcomes except one.

For more: <u>http://dx.doi.org/10.1287/deca.2016.0334</u>

Remembering Howard Raiffa
Ralph L. Keeney

The Legacy of Howard Raiffa
David E. Bell

DECA Blog

Be sure to check out the *Decision Analysis* journal blog: **Decision Analysis Review** at
https://www.informs.org/IOL-Home/Blogs/DECA-Blogs/DECA-Review

http://pubsonline.informs.org/toc/deca/13/3

DA Around the World

Column Editors: Chen (Mavis) Wang and Matthias Seifert

In this column we introduce Decision Analysis communities around the world with the purpose of promoting their visibility and strengthening the ties between DA researchers and practitioners across borders. In the current issue, we would like to summarize two exciting events that took place during the summer break. The first one relates to the DA cluster at the 2016 International INFORMS meeting in Waikoloa Village, Hawaii, which was coordinated by Vicki Bier and John Celona. The second one is a wrap up of the International Decision Conferencing Forum (IDCF), which was hosted by Carlos Bana e Costa, Ana Vieira, Mónica Oliveira, and João Lourenço in Lisbon, Portugal. For any enquiries or follow-up information on these two events, please do not hesitate to contact the responsible organizers (contact details are provided below).

2016 INFORMS International Conference Review

The 2016 INFORMS International Conference was held from June 12-15 in Hawaii, a wonderful place with unparalleled scenic beauty and cultural heritage. About 1,000 researchers and practitioners were attracted to the conference and presented topics covering a full range of operations research and analytics.

Vicki Bier (University of Wisconsin-Madison) and John Celona (Decision Analysis Associates) coordinated the Decision Analysis cluster at the conference, which consisted of the following seven sessions.

- Foundations and Applications of Satiation Preferences (*Session chair*: Manel Baucells)
- Deterrence Analysis (Richard John)
- Decision Analysis Arcade (John Celona)
- Behavioral Decision making: Methods and Applications (Yitong Wang)
- Trade-offs in Prescriptive Applications of Decision Analysis (Jay Simon)
- Legal Applications of Decision Analysis (John Celona)
- Revisiting the Foundations of Decision Analysis (Salvatore Greco and Fabio Maccheroni)

"The cluster was held at a fabulous location, but was also a fabulous experience," Bier said. "First, it was truly international, with session chairs from Australia and Italy in addition to the U.S., and speakers and attendees from a number of other countries, especially in Asia. So, the event provided an excellent opportunity for international exchange.

"The cluster also covered an interesting and varied set of topics. For example, we had sessions on legal applications of decision analysis, on how to model satiation preferences in utility theory, and on foundations of decision analysis, among others. With seven sessions spread out over four days, the cluster was busy enough to give attendees a stimulating intellectual experience, but not so busy that they couldn't enjoy the sights in Hawaii and sample sessions from other clusters."

She also added, "I especially want to thank my cluster co-chair, John Celona of Decision Analysis Associates in California, for helping to organize the cluster, chairing a couple of sessions, and giving an interesting presentation on the use of decision analysis in litigation."

The following pictures show DAS members at the conference presentations and with the fabulous scenery in sunny and breezy Hawaii.

2016 International Decision Conferencing (IDCF) Review

The IDCF is a specialized conference that gathers academics, researchers, and consultants to discuss themes related to Decision Conferencing (DC), Process Consultation, and Decision Sciences, and to exchange experiences and learning acquired in the practice of decision aiding and negotiation in public, private, and not-for-profit organizations. The first meeting took place in London 1989 and has been held on an annual basis at different international locations ever since. During the present year, the IDCF took place in the Lutécia Hotel in Lisbon, Portugal and was hosted by faculty members of the Instituto Superior Técnico and CEG-IST in beautiful Lisbon, Portugal (for more information, please contact Carlos at carlosbana@tecnico.ulisboa.pt or Monica at monica.oliveira@tecnico.ulisboa.pt).

The meeting was attended by 21 participants from 7 countries, including the two invited keynote speakers Larry Phillips and Terry Bresnick as well as rapporteurs Gilberto Montibeller and Monica Oliveira. The remaining attendees included Mara Airoldi, Matthias Seifert, Roxane Lavoie, Malcolm Cree, Thomas Krafft, Andrea Borsoi, Ana Vieira, Carlos Bana e Costa, Joao Lourenco, Antonio Alvarenga, Isabel João, Liliana Freitas, Teresa Rodrigues, Joao Bana e Costa, Ricardo Mateus, Antonio Quintino, and Paulo Nicola.

The meeting started out with a pre-conference workshop on the FOCCUSSED Approach for Decision Making, which was organized by Terry Bresnick. Over the course of two days, the main topics of discussion covered recent developments of DC, technical issues associated with the DC method, a company update provided by Catalyze Ltd in the United Kingdom, an introduction to Terry's latest book on making DA accessible to mass audiences, intersections of DC and adjacent methods such as scenario planning or the DELPHI method, behavioural and practical issues emerging in decision conferences, a summary of recent DC applications, and a discussion surrounding the future of DC. The rapporteurs concluded the sessions by pointing out that DC remains a diverse, growing community which could benefit from strengthened efforts to further promote DA practice as "simple but not simplistic," to motivate the growth and alignment of the community by making DC resources available, to explore the usefulness of innovative technologies (e.g., online tools) in DA research and practice, and to further study specific behavioural issues emerging during the DC process.

The IDCF then ended with a general business meeting in which concrete measures for raising the general awareness of DC were explored as well as possible locations for the summer 2017 meeting. Some of the specific initiatives resulting from this year's IDCF including the design of a permanent DC website, the creation of a new Wikipedia website (https://en.wikipedia.org/wiki/Decision_conferencing), and the planning of a new international DC summer school.

The IDCF meeting also included a lot of exciting social events such as a guided city tour through the old parts of Lisbon from where breath-taking views over the river Tajo could be enjoyed. The final conference dinner was held at a traditional local restaurant, before attendees headed out to celebrate one of Lisbon's most important public holidays (The Feast of St Anthony). The following pictures provide a glimpse at what was a highly enjoyable and productive conference:

DA Practice

Column Editor: Larry Neal

The Triple Bottom Line

Greetings everyone. Hope you and your families are well.

If you follow this column, you know I have been raising a number of issues about analysis where things are difficult to measure, aren't allowed to be measured at all due to legal concerns, and the role of narratives in decision making.

With his permission, I am reprinting a blog post by good friend and colleague Pat Leach. Pat's missive deals with the concept of the triple bottom line. Financial, environmental, and societal metrics that when taken together present a perspective many constituents believe in. Pat presents a framework for managing this accounting.

While an analyst may hold a different view than what Pat presents, it behooves us to bring clarity to the decision opportunity, and there are times when the triple bottom line is relevant. Without belaboring the issue any longer, here's Pat's blog.

Metrics for a New Century

I believe most companies do good work—they solve problems of one kind or another, they make life better and more enjoyable. And many of them are learning how to do so in a way that does not place an undue burden on the biosphere—the thin layer of earth, water, and air in which all known life exists. They are discovering growth opportunities through sustainable business strategies.

In a previous post (http://www.decisionpoint.decisionstrategies.com/Blog/Blog51/The-NOC-worldview-vs-the-IOC-worldview--or-Homo-Sapiens-vs-Homo-Economicus), I suggested that we need new metrics to measure the value generated by corporations as viewed through the lens of sustainability. Discounting a pro forma cash flow to calculate NPV generates a very good proxy for the monetary value of that cash flow, but that accounts only for the financial capital given off by the corporation. There are several more dimensions that should be taken into account when assessing value.

First (as previously mentioned http://www.decisionpoint.decisionstrategies.com/Blog/Blog40/Redesigning-Capitalism), financial capital is just one of at least three types of capital; natural capital (primarily in the form of natural resources) and social capital (in the form of improved quality of life and longevity, of healthy societal systems, etc.) are also important and valuable. Unfortunately, the brand of capitalism currently employed globally accounts only for financial capital. Natural capital is taken for granted and assumed to be essentially infinite; if a critical resource gets used up, it is assumed that a suitable substitute will always be available. The capacity of the Earth to absorb our wastes is also considered to be infinite and free (as long as it's not in our back yard). Social capital is pretty much ignored; if it is accounted for at all, it is somehow translated into how such developments affect measures of financial capital. Any effective value measures should account for all three types of capital, not just one.

Second, most people's and most societies' value systems encompass far more than just the generation of financial wealth. If corporations' actions affected only the global financial system, I wouldn't have a problem with valuing them based solely on financial metrics. But industries around the world affect our lives, the lives of future generations, and our environment in a multitude of ways, along dimensions in which our value systems may or may not align with simply maximizing financial return. It is complex; there are trade-offs to be made requiring far more than an NPV calculation. Many enlightened companies understand this and are changing how they think about strategic planning.

As we transition from the labor-constrained economy of the past several hundred years to the resource-constrained economy of the current century, we need better metrics for measuring corporate value. As a public service, I am putting forward the following straw man for consideration and feedback. It is qualitative at this point, so I'm cheating a bit by describing this as a system of "metrics."

To put it in a nutshell, I suggest that we take the approach currently used by accountants when conducting a financial valuation of a business, and apply that same logic when assessing the total impact (and therefore the real value added or eroded) on society by corporations' activities. When valuing a business, an accountant looks not only at the pro forma cash flows and income statements, but also at the balance sheet—the list of assets and liabilities in the company's possession. A company that generates revenue simply by selling off its assets isn't really generating value. A company that takes on liabilities—say, by

going heavily into debt—and counts the proceeds as revenue would be violating generally accepted accounting principles (GAAP). If assets are eliminated or degraded and/or if liabilities are taken on, valuing a company requires judgment regarding whether the value generated on the Income Statement more than offsets the degradation of the Balance Sheet.

So let's consider the planet we live on to be our collective "balance sheet." It holds a wide variety of assets (air, water, iron, wood, food, etc.), and it comes with liabilities (toxins, diseases, dangerous animals, violent storms, etc.). If we take into consideration all three forms of capital—financial, natural, and social—the benefits generated by any activity that consumes natural resources would have to more than offset the fact that future generations are left with a depleted stock of resources (assets). Likewise, those benefits must also more than offset any liabilities incurred (environmental degradation, the generation of harmful waste products, loss of biodiversity, etc.). If the benefits generated exceed the negative impacts on the "natural balance sheet," the activity is valuable; if not, the activity erodes value and should not be undertaken. For example, we might be willing to accept a significant amount of environmental degradation in exchange for the prospect of eliminating a deadly disease; a higher-definition TV, on the other hand, might justify only a much smaller erosion of natural capital.

Social capital is more nebulous, but we should be able to agree on certain positives and negatives (e.g., societal stability, widespread health and longevity, freedom to live life as one chooses, and accountable government are positive; poverty, extreme disparity in quality-of-life, lawlessness, and mistrust between societal factions are negative). Once high-level objectives under the Social Capital heading are agreed, we can discuss the trade-offs qualitatively.

When attempting such an assessment, natural capital and social capital should not be discounted the way financial capital is. It makes sense to discount future cash flows because if I have cash today, I can invest it and have more cash tomorrow. Not so with resources like iron, natural gas or fish populations (which, once they're depleted beyond a certain point, never regenerate), or even clean air and clean water (which don't get used up, but which are every bit as important to have in the future as they are today). Regarding social capital, I hope we can agree that improving the social fabric of our current society at the expense of future generations is not an acceptable approach.

All of this of course begs the question: if we're not going to simply convert everything into present-day dollars (which is what the overly simplistic benefit-cost analysis does), how do we decide whether a certain set of benefits outweighs the loss of resources and the erosion of the quality of the biosphere? And even if we can agree on an equitable way to make these judgments, aren't we assuming we can foresee what the benefits, loss of resources, and environmental degradations will be?

Let's take the second issue first. No, we should not assume that we can predict what all the consequences of our actions *will* be. Rather, we should try to imagine what the consequences *could* be—how good, how bad, how severe, how mild. Once we have an idea of these ranges, then we need to consider the probabilities associated with them, whether there are potential scenarios we absolutely must avoid, whether there are contingency plans we might want to develop before proceeding, and whether there are options we might want to keep open for a while. Planning for flexibility is a very good way to deal with an uncertain future. Note that this isn't just the best way to think about technology advancement vs. environmental degradation issues; it's the best way to think about *any* complex issue. Note also that the fact that we aren't sure about potential second- and third-order effects of our actions is no excuse for pretending they don't exist and/or failing to consider them.

Regarding how to weigh benefits against "natural balance sheet" losses, I don't claim this will be easy. Assessing trade-offs between competing objectives never is. It requires thinking, not just calculating. The benefits associated with an activity may be highly uncertain, and human history is littered with examples of unintended negative consequences that resulted from well-intentioned initiatives. But that's no reason to dumb the valuation process down. Just because you're good at algebra, you don't try to turn everything into an algebra problem. Likewise, trying to shoehorn every complex issue facing humanity into an economic equation is folly. The world is a complex place, made more complex by human activities. Pretending that we can appropriately value projects, companies, and public initiatives using simple financial calculations is an exercise either in laziness or self-delusion. The only reasons we've got away with it so far are 1) we inherited an enormous natural balance sheet loaded with assets—far more than we thought we could ever consume—and 2) the time scale on which we pay for the environmental degradation liabilities we have generated was always believed to be far into the future. Neither of those situations is true today. Companies that realize this and adjust their thinking accordingly will be advantaged relative to those that don't.

When making these trade-offs, we're going to have to exercise judgment. The basis of that judgment should be to assess our industrial activities (as best as possible) from the perspective of whether they leave future generations better off or worse off, not just whether they generate an attractive discounted cash flow today. This is difficult. In a complex world, we cannot know for certain what the ultimate consequences of our actions will be. Experimentation will be important, so we should err on the side of allowing new ideas to be tested. There will also undoubtedly be fierce arguments about what constitutes "better." However, I prefer to think of these arguments as "discussions"—and discussion is good.

This is what the current move toward sustainable business practices is all about. Ultimately, we want to leave for future generations a financial, natural, and social environment that is at least as good as the one we enjoy. Modifying accounting's "income statement vs. balance sheet" approach to incorporate all three types of capital when valuing projects, corporations, and/or public works seems like a good start toward accomplishing this objective.

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As always, I welcome all feedback and ideas. You can contact me at lnealjr@larrynealjr.com.

Society for Decision Professionals

SDP Learning Exchange

The Society of Decision Professionals (SDP) and the DAS continued their collaboration this quarter by co-sponsoring a successful Learning Exchange Webinar in August 2016. The presentation featured the winner of **the 2015 INFORMS Franz Edelman Award** presented by Jack Kloeber, Kromite and SDP Fellow.

Bringing Decision Analytics to Agriculture R&D—Sygenta's Edelman Prize Winning Effort

This presentation focuses on the Decision Quality aspects of Syngenta's efforts to create R&D models to create more effective soybean breeding strategies. The replay of this webinar can be heard via this link: http://www.decisionprofessionals.com/articles/Bringing-Decision-Analytics-to-Agriculture-R-D

SDP webinar archives are posted in the library section of the SDP website at www.decisionprofessionals.com. The webinars are free and open to SDP members and non-members alike. We hope you can join us!

2017 DAAG Meeting (March 15-16 in New Orleans, USA)

The 2017 DAAG Logistics Committee, a part of the SDP Program Council, has selected New Orleans as the site for DAAG 2017. The conference will be held on March 16 & 17 and preceded by a workshop day on March 15. Call for papers will be announced soon.

2016 EDPN Conference (October 4-6 in Copenhagen, Denmark)

The 2016 conference of the European Decision Professionals Network (EDPN) will be held at the Copenhagen Business School in Denmark. EDPN provides a platform for Decision Professionals in both business and government who aim to promote and support high quality decision making within their own or their clients' organizations. EDPN is the first European network with a focus on decision making and the practical applications of Decision Analysis methodologies and the Decision Quality concept.

The goal of this conference is to strengthen the network of Decision Professionals across Europe. The conference will bring together practitioners and experts in decision analysis across industry, academia and government, giving you the unique opportunity to exchange your practical experience, knowledge, and latest insights in this field with other decision professionals. For more details and registration, visit: https://www.eiseverywhere.com/ehome/index.php?eventid=161908&.

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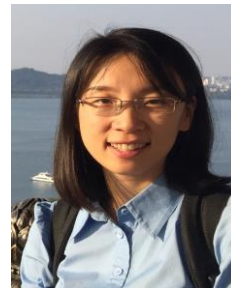florian.federspiel@incae.edu

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