

# Decision Analysis Newsletter

**informs**

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**We Will Never Forget**

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## Inside:

From the Chair .....	1	DA Affinity Group .....	5	DAS Survey Results .....	7
2001 DAS Awards .....	2	New Publications .....	5	Evening with Jason Alexander .....	8
David E. Bell .....	3	The DA Journal .....	6	New Positions .....	8
From the Editor .....	4	DA Education Foundation .....	6	New Opportunities .....	8, 9
DAS Officers .....	4	DAS Council .....	7	Upcoming Conferences .....	10

## From the Chair



L. Robin Keller

I enjoyed seeing many of you in Miami at the Fall INFORMS conference. I enjoyed hearing about everyone's decision analysis ventures (and other adventures!).

Join me in congratulating our new Council members *John Butler* and *Kara Morgan*. Thanks to our outgoing council members, *Vicki Bier* and *David Lowell*.

Congratulations to our award winners, Ramsey Medalist *David E. Bell*, Publications award winners *John*

*Hammond, Ralph Keeney, and Howard Raiffa*, for their book Smart Choices. The Practice award winner is *Eric Johnson*, and finalists are *Phil Beccue* and *Gary Boyd* with *Greg St. Pierre*. The Student publication award winner is *Manel Baucells*, for his paper with *Lloyd Shapley*, and the honorable mention awardee is *Richard M. Anderson* for his student paper with *Benjamin F. Hobbs*.

Thanks to all the people working on society activities and on strategic planning for our society's future.

### News on our publications:

*Bob Clemen* and *Don Kleinmuntz*, co-editors of the new *Decision Analysis* journal strongly encourage everyone to submit papers now! Newsletter editor *Jim Felli* will soon complete his term. Thanks to Jim for all the humor and interesting articles in the newsletter. Welcome to *Jayavel Sounderpandian* who has been appointed as the new newsletter editor.

### News on conferences:

Contact *Greg Parnell*, chair of the DA Society Conference Task Force, if you would be interested in organizing a stand-alone society meeting, probably during a Spring or Summer time-period. (Also, contact him right now if you'd like to present a paper at the Edinburgh IFORS conference this July, abstracts are due in December.)

*Don Kleinmuntz* will be presenting a talk at the INFORMS Practice conference in Montreal in Spring 2002. He will be the DA Society liaison for the practice conference, so contact

*continued on page 10*



*"Readiness, mobilization and logistics -- that's what it's all about." -- Santa.*

# 2001 Decision Analysis Society Awards



Detlof von Winterfeldt presents **Eric Johnson** (R) with the practice award for "Life-Cycle Strategy Analysis."



Detlof von Winterfeldt presents **Phil Beccue** (L) with a practice honorable mention for "Choosing a Development Strategy for a New Product at Amgen."



Ralph Keeney presents **David E. Bell** (L) with the Ramsey Medal for distinguished contributions to the field of decision analysis.



John Butler presents **Manel Baucells** (L) with the student paper award for "Multiperson Utility," (co-author, Lloyd S. Shapley).



John Butler presents **Richard M. Anderson** (R) with a student paper honorable mention for "Using a Bayesian Approach to Quantify Scale Compatibility Bias" (co-author, Benjamin F. Hobbs).



**Ralph Keeney** (L) accepts the publication award from Vicki Bier on behalf of himself, **John Hammond** and **Howard Raiffa** for Smart Choices. The three co-authors accepted plaques and contributed their monetary awards to the DAS.

**Not Shown:**  
*Gary Boyd and Greg St. Pierre received a practice honorable mention for "Risk Assessment and Management for Chemical Weapons Disposal."*

## Six Questions for Ramsey Winner, David E. Bell

**DASN:** What brought you to the field of decision analysis?

**DEB:** I was in my college library doing some course work and , being bored, started reading some of the books on the shelf behind me. One was Howard Raiffa's Decision Analysis. I thought it was really great. After looking through it I turned to the back cover and read about Howard Raiffa "Frank P. Ramsey Professor of Managerial Economics". I remember speculating, idly, and only in the "small world" sense, whether I would ever meet this Howard Raiffa. I came from Oxford to MIT for graduate work not at all inspired by that moment. I applied to MIT (my only application) because I discovered that for two years it was experimenting by not charging the application fee for foreign applicants. The fee at the time was probably about \$20. At MIT I met the young Ralph Keeney, then an Assistant Professor. Being both single, we spent many an evening together. He would describe his research into multiattribute theory and I got hooked. He also took me with him (on the back of his motor-bike) to Harvard to attend the decision analysis seminar there. That's where I first met Howard Raiffa.



David E. Bell

**DASN:** Which one was the most satisfying aspect of decision analysis, in theory or practice? Why?

**DEB:** To me, decision analysis is simply a fact of life. You don't have to justify the axioms and implications to me, they just are a truism, a tautology. Indeed I would say that most of my research could be described as a search for reasons why the rest of the world doesn't necessarily share my view.

**DASN:** What do you think are the greatest lessons you've learned during your study and practice of decision analysis?

**DEB:** Perhaps the greatest lesson was the result of my studying psychological aspects of decision making. As a result, I have pretty much learned not to get upset if I make a wrong decision or fail to get the outcome I had wanted. I recognize these as psychological reactions, not information about my decision making capabilities. My life has been pretty calm since.

**DASN:** What do you perceive as the major threats/opportunities facing those of us already involved in the field of decision analysis?

**DEB:** The main threat is that the advances we have made become co-opted by other fields. I recently read the work of an economist who was recycling (though I assume he doesn't realize it) work done by Robert Schlaifer 30 years ago. Behavioral Economists and Nonlinear Utility Theorists are increasingly attending separate conferences and publishing papers in differing journals. Decision Analysis needs to stay in the mainstream and not become a niche discipline. Someone should have won the Nobel Prize for Economics for insights into Decision Analysis but it looks like that won't happen.

**DASN:** What advice would you offer to students and new professionals looking at decision analysis as a field of study?

**DEB:** Decision Analysis needs to be implemented more than it has. I admire the fields like medicine where it has become a basic tool of the modern analyst. We know a tremendous amount about the theory of decision analysis but very little about the practice of it. Ron Howard asked me (again) recently if I used a utility function to make my own financial decisions. I don't. Something is wrong with this picture. A great Ph.D. thesis would be to force luminary decision analysts to assess their own utility functions, make a real decision and see how they like it. What insights that could generate!

**DASN:** Where will you go from here?

**DEB:** The Ramsey Medal is more or less a lifetime achievement award so I suppose I should quit while I'm ahead. But the truth is I have only ever worked on decision analysis because I loved to do it. You can't stop me. At MIT I was financed by Jeremy Shapiro's grant to study integer programming. And indeed my Ph.D. thesis was on integer programming. But my Master's was on utility theory. At IIASA I was in a group led by George Dantzig, but worked on utility stuff anyway. I've been at the Harvard Business School for 25 years teaching things like marketing and, for the last ten years, retailing, all the while writing and thinking about utility. A lot of the decision analysis research I have completed has been done at weekends, at nights, on planes and on beaches. It has been a hobby almost. It will continue to be a passion.

## From the Editor

Jim Felli

Howdy, all. This is my last column as newsletter editor, so I suppose it has to be good. Well, I'll try...

First off, thanks to the eleven people who correctly identified last issue's mystery pic as Burgess Merideth from the Twilight Zone episode "Time enough at last." The new puzzle is on page 11.

Looking back over the last two years, it's been an honor and a pleasure to serve as the editor of this newsletter. As a consequence of this position, I've had a unique opportunity to keep abreast of the goings on of the Decision Analysis Society, witness the birth of a new journal and interact with people I'd have otherwise nervously avoided. It has been an enriching experience for me and, I hope, a fun ride for you. If there is one worthwhile thing I've learned in this appointment, it's this: nobody bit me. What do I mean by that? As editor, I was charged to talk to *everyone*, from fresh young graduate students to the real heavy hitters in the DA arena. I was terrified. But you know what? It turned out to be fun. Our society is teeming with people who sincerely care about decision making, from psychological and behavioral foundations to industrial applications, and enjoy helping out their colleagues, young and old, freely offering advice and encouragement. My advice to you all is to take advantage of this. Talk to people. Collaborate. Socialize. That's how we'll keep our society thriving.

Looking forward, Jayavel Sounderbandian will be your new editor (insert fanfare here) as of next issue. I hope that you'll send him whatever you can contribute, because an editor is never truly alive unless he has too much to read! As for me, I've cleverly hidden a picture on this page that expresses my feelings for our society and all of you, my fellow DAers.



Incoming DASN editor,  
Jayavel Sounderbandian



"Live long, and prosper." -- Mr. Spock.

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## Decision Analysis Affinity Group

C. Thomas Spradlin and David C. Skinner

The Decision Analysis Affinity Group (DAAG) was founded in 1995 as a volunteer organization to foster the discipline of decision analysis (DA) in industry, to provide benefit to the companies making use of the methodology, and to further the expertise, development, and careers of the industrial practitioners. The hallmark of the group has been a collegial atmosphere of open interchange and energetic participation. Our experience suggests that those objectives can also be promoted by the judicious inclusion of experts from outside the industrial practice of DA, and the purpose of this article is to lay out the guidelines for participation of all parties in DAAG.



C. Thomas Spradlin

Historically, membership in DAAG has been loosely defined by the list of those recently notified of annual meetings, augmented by any additional persons who actually attended. Decision Strategies, Inc. has agreed to maintain this list. The "membership list" of DAAG will continue to be basically those attendance lists.

Starting with the 2002 conference, attendance will be open to all persons, subject to enrollment limits. All attendees are expected to comport themselves in accordance with several rules of conduct. There shall be no overt marketing of consulting services, and there shall be no overt attempts at recruit-

ing. Attendees are expected to participate in the conference to a reasonable level, not simply to attend and take away, leaving nothing behind. Finally, attendees are expected to refrain from discussing prices or any other subject that may be interpreted as a restraint of trade with attendees from competitor companies.

The host of the annual conference and Decision Strategies, Inc. share two responsibilities. First, they jointly decide to whom to send explicit notification of the conference in addition to the attendance list from the previous year. Second, they share the responsibility to limit and/or decline enrollment to any party, whether because of enrollment limits, a history of non-participation, or past unacceptable recruiting or marketing practices. However, such a denial will be based on past or anticipated behavior and participation, not on the affiliation of the applicant.

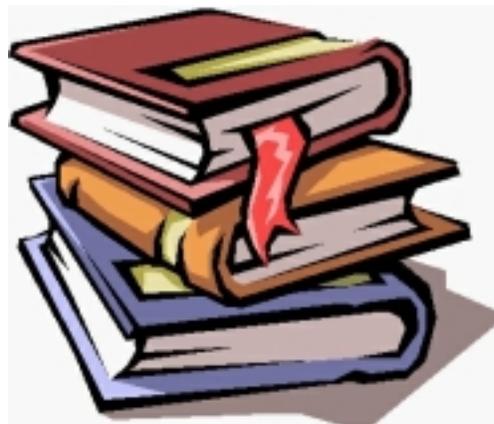


David C. Skinner

## New Decision Analysis Publications

### Decision Analysis for the Professional

SmartOrg, Inc. announces the 3<sup>rd</sup> edition of Decision Analysis for the Professional by Peter McNamee, Ph.D. and John Celona, JD. The book provides easy to follow explanations of the decision analysis process and its application to corporate decision making. For more information on this book, contact Don Creswell at [dcreswell@smartorg.com](mailto:dcreswell@smartorg.com).



### Rational Choice: Models to Improve Judgment

An almost complete draft of Rex Brown's introductory decision analysis text, Rational Choice: Models to Improve Judgment, is now available on-line at <http://mason.gmu.edu/~rbrown>. The available text is student-ready and has had teaching notes removed. For more information, contact Rex at [rbrown@gmu.edu](mailto:rbrown@gmu.edu).

## The DA Journal

Bob Clemen and Don Kleinmuntz

Decision Analysis is up and running! Following our initial call for papers this summer, we have received a number of submissions, several of which are already in the review process. This is a good start, but we want to emphasize that it is only a start, and that the journal will succeed only if we can quickly generate a substantial and consistent flow of submissions. You can help in two ways.

First and foremost, we encourage you to submit your own work as soon as you can. If you have questions about whether your ideas are appropriate for *Decision Analysis* or how to position the paper, please contact either Bob or Don (contact information below). They can help you think about these issues.

Second, you can help by spreading the word about *Decision Analysis*. As you encounter individuals who are working on projects that might be appropriate for the journal, we hope you will tell them about the journal, be sure they know the journal's URL (<http://da.pubs.informs.org/>), and encourage them to submit their papers. If you plan to attend a non-INFORMS conference, please communicate with Bob or Don before you go. They can provide you with up-to-date materials and information to use in promoting Decision Analysis at the conference.

Thanks again for all of the support. Please send us your best work!

**Don't forget to make your contribution(s) for the next issue of DASN!**

## Decision Analysis Education Foundation



Dave Reiter

Making good decisions is an essential life skill, but few people are taught to make choices well. As a result, people in all walks of life miss major opportunities to enhance their lives and the lives of others. Worse, some people's poor choices lead to serious troubles.

The Decision Education Foundation (DEF) is a new nonprofit organization dedicated to helping people better their lives through improved decision-making. The founders of the organization include academics, consultants, researchers, teachers, students, and community leaders. The group seeks to share key insights from decision analysis to enhance the quality of personal decision-making for everyone. The Board of Directors, led by President Ron Howard, is committed to a long-term vision in which decision training is recognized as an essential component of a well-rounded education.

The DEF will concentrate initially on American youth through the high school years, and include their parents and teachers. Initial programs will center on projects that promise to provide immediate benefits and visibility,

paying special attention to high-risk youth. The three initial programs organized by the DEF are:

**Character-Based Education.** Santa Clara University's Markkula Center for Applied Ethics provides a "Character-Based Literacy" language arts program for over one hundred alternative schools in the San Francisco Bay Area. The DEF will create a series of decision-centric material for this program and provide training and support to its teachers.

**Aspire Public Schools.** Aspire Public Schools is a non-profit organization that creates charter schools in California. Its first high school opened this fall to serve East Palo Alto, a low-income community. The DEF is helping Aspire to create an "Advisory" curriculum, which addresses important life-skill topics outside the conventional high school subject areas.

**Decision-Making Course for Gifted Teenagers.** The DEF will create its own course for gifted high school students and deliver it in summer 2002. We plan to incorporate this course within existing programs that serve gifted teens.

Together, these programs provide the DEF with an opportunity to work with at-risk youth, low-income youth, and gifted youth. One of the goals of the initial programs is to gain experience via observation and teaching in a variety of classroom settings that will provide a fertile base for further development. Although the initial programs are centered in the San Francisco Bay Area, the DEF's vision for scope of influence is broader; we hope to introduce decision education to as wide and diverse an audience as possible.

The DEF is not the first group to teach decision-analytic concepts to teenagers. We follow in the footsteps of ef-

*continued on page 10*

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## DAS Survey Results



Robin Dillon

As hopefully most of you know, we surveyed our membership in the spring with an on-line form to find out how you felt as members, and I would like to thank the 143 people who responded. In general, many people appreciated the opportunity to provide feedback to the society, a few questioned what constitutes DA, and several people felt that the web-site was not updated often enough.

More specific results included why people were members of the Decision Analysis Society: 30% consider the most important reason for joining DAS to receive the journals and other publications, 45% to attend conferences/meetings/other forums to hear/discuss/present current developments and new ideas in DA, 3% for job search opportunities, 17% for networking opportunities, and 5% for other reasons.

80% live in the United States, 12% are students, and 40% are academics (faculty). While we are excited that 75% are aware that we are starting the new "Decision Analysis" Journal, 18% have never visited the DAS web-site and 50% are not subscribers to the DAList.

Regarding professional meetings: 30% have never attended an INFORMS meeting, 25% have attended 1-3, and 45% have attended more than three. Also, 41% think that the DAS should organize a separate meeting, 17% do not, and 42% are not sure, but only 14% say that it is highly likely that they would attend a separate meeting (probability greater than 0.75). If we had a separate meeting, 31% would like it at a university and 30% would like in at a conference hotel in a major city (similar to INFORMS). May was considered the best time (18%), followed by March (13%) and July (12%).

We hope to use this information to help improve the satisfaction of our current members and to attract new members. Of the respondents, 62% learned about the DAS from INFORMS, 20% from their advisor or other faculty in their academic department, and 12% from colleagues. And you identified that the most important benefit of a professional organization is as a forum for learning (56% felt this was very important). Therefore, we hope to focus on this by promoting the DA journal and getting everyone to submit manuscripts so that we can continue to learn from each other, and by continuing to explore the feasibility of a stand alone meeting. I hope you find this feedback interesting, and if I can explain the data further or you have additional comments to help us improve, please feel free to e-mail me at: *rld9@georgetown.edu*.

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**General DA question?  
Send it out to the DAS  
by emailing it to  
*DAList@fuqua.duke.edu***

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## My evening with Jason Alexander



Scott B. Cantor

This story is not immediately obvious to be about decision analysis, but it is about how we how we might turn mathematical insights into “magic” or entertainment. Let me explain.

This past October, I took my family to see a benefit concert featuring Jason Alexander. For those of you who have been living with their head in the sand and not watching television these past 10 years, Jason Alexander is known for his role as “George Castanza”, Jerry Seinfeld’s buddy.

Getting back to the story, Mr. Alexander gave quite a performance that evening, including singing and accompanying himself on the piano, telling jokes mimicking Woody Allen’s voice and routine, and performing magic — he even escaped from a strait jacket! After completing one magic trick, Mr. Alexander asked the audience for a volunteer — for someone who was good in math. All of a sudden, I noticed that my 2 arms were being held up — 2 of my children were sitting on either side of me holding my arms up! Even though

I was sitting in the 15<sup>th</sup> row, Mr. Alexander quickly spotted me as the lone person holding up any hands, and I walked quickly to the stage. We shook hands, I introduced myself, and then Mr. Alexander gave me a calculator.

Jason told me to choose a 4-digit number, with all digits different, and enter it into the calculator. He then asked me to choose another 4-digit number using the same digits as the original number, but all mixed up. He then told me to subtract the new number from the original number. I laughed and told him that I couldn’t do that without getting a negative result. He told me to try it all again, but to make sure I could do the subtraction. I did as he requested, and got an answer.



Jason then said for me to say aloud 3 of the 4 digits in the answer, and then point at him, at which time he would tell me the 4<sup>th</sup> digit in the result. I announced “5”, “1”, “3”, and waited. “0”, Jason responded — and he was right! The audience applauded.

I returned to my seat, borrowing a pen from my wife Lisa, and started to do some subtraction while the concert continued! Quite quickly I recognized how Mr. Alexander did the trick — it was based on a math trick I had learned in elementary school known as “casting out 9’s”. The difference

*continued on page 10*

## New Positions

**Dennis Buede** is now Director of the Graduate Systems Engineering Program (and Professor) at Stevens Institute of Technology in Hoboken, NJ. Dennis started this position during the summer and is having great success with his colleagues at Stevens in growing the off-campus systems engineering program and developing both additional research funding and new Ph.D. students. He was also made a Fellow of the International Council on Systems Engineering this past summer. He can be contacted at [dbuede@stevens-tech.edu](mailto:dbuede@stevens-tech.edu).

## New Opportunities

### UC Irvine

The University of California Irvine Graduate School of Management (GSM) is recruiting for one faculty position at the assistant professor level in Operations and Decision Technologies to begin in Fall 2002. GSM is committed to research and scholarship with teaching responsibilities in MBA and Ph.D. programs. A Ph.D. in a relevant discipline is required. Contact **Prof. Carlton Scott**, [chscott@uci.edu](mailto:chscott@uci.edu).

### NEC Research Institute

Position open for a postdoctoral research scientist investigating computational issues in ecommerce. The institute has as its mission basic research in computer science and physical sciences underlying future technologies relevant to NEC. The Institute has research programs in theory, machine learning, computer vision, multimedia, computational linguistics, web characterization and applications, and bioinformatics, as well as research activities in physical sciences. Contact **David M. Pennock**, [dpennock@research.nj.nec.com](mailto:dpennock@research.nj.nec.com).

## Even More New Opportunities!

### Darden Graduate School of Business Administration

Applications are invited for a tenure-track faculty position in the quantitative analysis area. The applicant would be expected to teach the first-year Quantitative Analysis course in our MBA program, and develop and teach electives in one or more of the areas: decision analysis, dynamic systems, electronic commerce, information technology, management science, negotiation, risk management, simulation, and stochastic systems. Contact **Professor Robert L. Carraway**, [CarrawayR@virginia.edu](mailto:CarrawayR@virginia.edu).

### Goizueta Business School

The Goizueta Business School of Emory University is seeking candidates for one or more faculty positions at any rank (either tenure-track or tenured) in the Decision & Information Analysis Area. Candidates should

have a Ph.D. in Operations Management, Decision Analysis or a closely related field, and a record of scholarship, professional achievement and successful teaching in MBA and executive MBA programs. Contact **Patrick Noonan**, [patrick\\_noonan@bus.emory.edu](mailto:patrick_noonan@bus.emory.edu).

### Naval Postgraduate School

The OR Department is recruiting for a tenure-track faculty position. Preferred research interests are in stochastic systems analysis including applied probability, decision analysis and dynamic-systems modeling. The position requires strong communication and human relations skills in order to teach effectively, as well as to collaborate on research projects with students, faculty and research sponsors. A Ph.D is required. Their website is <http://web.nps.navy.mil/~opnsrsch>. Contact **Richard Mastowski**, [rmmastow@nps.navy.mil](mailto:rmmastow@nps.navy.mil).

### Fair Isaac

Fair Isaac is seeking a mid-level and a senior-level decision analyst. Responsibilities include carrying out decision analysis applications in an industry of considerable size, complexity and sensitivity, and developing methodologies to make future applications better, faster, etc. Candidates should possess a M.S. or PhD in Management Science, Operations Research or equivalent. Industry experience in applying decision analysis to real-world problems required. Contact **Dr. Robert Fung** at [RobertFung@fairisaac.com](mailto:RobertFung@fairisaac.com).

### Unilever

Unilever is one of the worlds largest consumer goods companies selling home, personal care, and foods products in over 150 countries. The Safety and Environmental Assurance Centre (SEAC) is a central resource providing expertise and advice on all areas of safety and the environment to Unilever's global operation. Within SEAC, the Risk Analysis Unit has openings for for a probabilistic modeler (risk analyst) and two for decision analysts. Contact **Deborah Hale**, [s&swgc@srg.co.uk](mailto:s&swgc@srg.co.uk).

### Fuqua School of Business

Duke University has tenure-track openings for Decision Sciences faculty in the Fuqua School of Business. Will consider highly qualified entry-level candidates and experienced faculty with exceptional research records. Candidates should have strong potential for research innovation, excellence, and impact, with interest in both theory and application. Potential for teaching excellence with MBA, executive, and Ph.D. audiences is also very important. Recruiting website: <http://faculty.fuqua.duke.edu/recruiting>. Contact **Professor Robert Nau**, [rnau@mail.duke.edu](mailto:rnau@mail.duke.edu).

*Not so fast, old chum.  
Perhaps a multiattribute  
decision model would help  
identify the **best** one...*

*Holy-opportunity,  
Batman! Look at  
all these jobs to  
choose from!*



## Upcoming Conferences

*Association for Consumer Research*: May 16 to 18, 2002 Asia-Pacific Conference, Beijing, China. <http://home.ust.hk/~mkzwick/AsiaPacificACR2002.html>.

*Hawaii International Conference on Statistics and Related Fields*: June 5-9, 2002, Sheraton Waikiki Hotel, Honolulu Hawaii, USA. Submission deadline January 16, 2002. <http://www.statistics.hawaii.edu>.

*Bachelier Finance Society 2<sup>nd</sup> World Congress*: June 12-15, 2002, Crete, Greece. <http://www.ma.utexas.edu/Bachelier2002/>.

*16th Triennial Conference of the International Federation of Operational Research Societies*: July 8 - 12, 2002, University of Edinburgh, Scotland. <http://www.som.umd.umich.edu/ifors2002/index.htm>.

*Society for Medical Decision Making Annual meeting*: October 20-23, 2002, Baltimore, Maryland, USA. <http://www.smdm.org/>.

*INFORMS Annual Meeting*: November 17-20, 2002, San Jose, California, USA. Submission deadline Jan. 16, 2002. <http://www.informs.org/Conf/SanJose02/>.

*Behavioral Decision Research in Management Conference*: May 31 - June 1, 2002, University of Chicago Graduate School of Business, Chicago, Illinois, USA. Submission deadline Jan. 15, 2002. <http://www.uchicago.edu/conference/bdrm/>.

## *DAS policy is now to rent projectors for laptop computers at conferences.*

### **From the Chair**

*Continued from page 1*

him if you'd like to get involved in that conference.

*Jim Felli* and *Robin Dillon* are the DA Society cluster co-chairs for the Fall 2002 INFORMS conference in San Jose. Contact them if you'd like to be a session chair or be asked to give an invited paper.

### **News on DA Society membership and by-laws:**

*Robin Dillon* is the new chair of the Membership Task Force, with members, *Kara Morgan*, and *Jim Felli*. See the article by Robin on the membership survey results in this newsletter. Thanks to *Jennifer Meyer* for

chairing the Membership Task Force this past year. *Robin Dillon* is chairing a committee to revise our by-laws. Two main changes being considered are 1) allowing electronic voting via the web rather than only paper ballots and 2) changing the title of the DA Society from "Chair" to "President."

New officers traditionally took office at the end of the DA Society business meeting at the Spring conference. Since we don't have a Spring conference for the DA Society anymore, this Spring I will be passing a symbolic virtual gavel over to welcome incoming *Chair Elisabeth Paté-Cornell*. As past-chair, I will be the chair of the next DA Practice Award competition, so I hope you all start thinking now about making a submission!

### **Foundation**

*Continued from page 6*

forts led by Robin Gregory, Bob Clemen, Rex Brown, Howard Raiffa, Jonathan Baron, Baruch Fischhoff, Leon Mann, and Marilyn Jager Adams, among others. We will be inclusive: we encourage the participation of all interested parties. An important step towards this goal was a session sponsored by the Decision Analysis Society at November's INFORMS conference in Miami Beach: the panel discussion on "Pre-College Decision Analysis Education" chaired by Ron Howard.

The Decision Education Foundation pursues its mission on a nonprofit basis and relies on donations of time and money to achieve success. At the time of writing, thirty-two volunteers are actively supporting DEF activities. We thank the individuals and companies who have made generous donations to the DEF. In particular, we would like to thank the Strategic Decisions Group (SDG) for its continued financial and operational support. To find out more about DEF, please contact me at [reiter@stanford.edu](mailto:reiter@stanford.edu).

### **Jason Alexander**

*Continued from page 8*

between any number and another number based on a rearrangement of digits of the original number will always be a multiple of 9.

For example, if a, b, c, and d are numbers between 0 and 9 inclusive, then the four digit number "abcd" can be expressed as  $1000*a + 100*b + 10*c + d$ . The same number with digits reversed ("dcba"), is equal to  $1000*d + 100*c + 10*b + a$ . The difference of the two numbers is equal to  $999*a + 90*b - 990*c - 999*d$ . Because each term in the difference is multiplied by a multiple of 9, then it is obvious that the entire difference is also a multiple



*A few of the ever-congenial DAers attending the INFORMS International conference in Maui this summer. Hmm, howzabout we make a puzzle out of this picture to welcome Jayavel Sounderbandian as next issue's editor? Who can provide these folks' names in the proper order?*

of 9. And every elementary-school child knows that the sum of the digits of a multiple of 9 must also be a multiple of 9 as well. Thus, all Mr. Alexander would have to do is take the sum of the 3 digits said aloud, and determine what number would need to be added to the sum of the 3 given digits to achieve a multiple of 9. So, if I had said the digits “4”, “6”, and “7”, Mr. Alexander would mentally find the sum  $4 + 6 + 7$  to get 17, and the missing digit would be “1” (necessary to achieve 18). A neat little trick.

But as I discovered, a problem occurs if the 3 spoken digits already add up to a multiple of 9. (Just as actually happened!) In that case, it's a guess whether “0” or “9” is the missing digit.

For example,

$$9532 - 2953 = 6579$$

$$9532 - 3925 = 5607$$

In either case, I could have responded “6”, “5”, and “7”. In the top case, the missing digit is “9”. In the bottom case, the missing digit is “0”. I have tried out all the possible combinations, but I wouldn't be surprised if the guess between correctly answering “0” and “9” is a 50-50 proposition.

But perhaps Jason Alexander has already done the decision analysis. He has determined that the probability that his volunteer gives 3 digits whose sum is already a multiple of 9 is quite small — perhaps only 2% of cases. And even if he guesses wrong, he certainly

can get the answer right on the second try. So, the “sure thing” is not doing the math trick at all. The gamble is two possible outcomes: with probability 0.98, Mr. Alexander will be able to guess correctly on the first try, and with probability 0.02, Mr. Alexander will be able to guess correctly on the second try. I would guess that the expected utility of the gamble is far superior to the expected utility of the “do nothing” or “do no trick” strategy! Perhaps Jason Alexander used decision analysis to decide whether or not to perform this math trick!

I'm still surfing the web, to look for Jason Alexander's address. I want to be sure he knows that his trick isn't guaranteed to work all the time!



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