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Copies of papers abstracted in the meeting program are available only from the authors. Requests for papers should be sent to the authors at the addresses shown in the program. Published annually prior to the meeting by the Institute for Operations Research and the Management Sciences. Individual issues of the program are available for \$20US per copy. Orders must be prepaid and sent to INFORMS, PO Box 632820, Baltimore, MD 21263.
NOTE:
All technical sessions are held at the
University of Buenos Aires Law School, Floors
1,2 and 3 . Check the Master Track Schedule
on pages $12-13$ for specific room locations.

BADGES REQUIRED FOR TECHNICAL SESSIONS

ALIO-INFORMS International Meeting 2010 badges must be worn to all sessions. Attendees without badges will be directed to the registration desk to register and pick up their badges. All attendees, including speakers and session chairs, must register and pay the registration fee.

## QUICK REFERENCE

including the
Master Track Schedule
Don't miss this handy reference. It's a separate flyer that came with your program. The Master Track Schedule is also printed on pages 12-13.


Conference Bag Sponsor


Monday Coffee Break Sponsor


## SUNDAY, JUNE 6

| 9:00am-7:00pm | Registration | Hall de los Pasos Perdidos |
| :--- | :--- | :--- |
| 9:00am-4:30pm | Exhibits | Hall de los Pasos Perdidos |
| 10:00am-11:30am | Technical Sessions (SA) | Floors 1, 2 \& 3 |
| 11:45am-1:15pm | Technical Sessions (SB) | Floors 1,2 \& 3 |
| 1:15pm-2:30pm | Lunch Break (on your own) |  |
| 2:30pm-4:00pm | Technical Sessions (SC) | Floors 1, 2 \& 3 |
| 4:00pm-4:30pm | Coffee Break | Hall de los Pasos Perdidos |
| 4:30pm-6:00pm | Technical Sessions (SD) | Floors 1, 2 \& 3 |
| 6:00pm-8:00pm | Welcome Reception | Hall de los Pasos Perdidos |

MONDAY, JUNE 7

| 8:00am-6:00pm | Registration |
| :--- | :--- |
| 8:30am-10:00am | Technical Sessions (MA) |
| 9:00am-4:30pm | Exhibits |
| 10:00am-10:30am | Coffee Break |
| 10:30am-11:20am | Welcome \& Plenary: Celso Ribeiro |
| 11:30am-1:00pm | Technical Sessions (MB) |
| 1:20pm-2:50pm | Technical Sessions (MC) |
| 3:00pm-3:50pm | Keynote:Sebastián Ceria |
| 3:00pm-3:50pm | Keynote: James Cochran |
| 3:50pm-4:20pm | Coffee Break |
| 4:20pm-5:50pm | Technical Sessions (MD) |

Hall de los Pasos Perdidos Floors 1, 2 \& 3
Hall de los Pasos Perdidos Hall de los Pasos Perdidos Salón de Actos
Floors 1, 2 \& 3
Floors 1, 2 \& 3
Aula Magna
Auditorio
Hall de los Pasos Perdidos
Floors 1, 2 \& 3

TUESDAY, JUNE 8

| 8:00am-6:00pm | Registration | Hall de los Pasos Perdidos |
| :--- | :--- | :--- |
| 8:30am-10:00am | Technical Sessions (TA) | Floors 1,2 \& 3 |
| 9:00am-4:30pm | Exhibits | Hall de los Pasos Perdidos |
| 10:00am-10:30am | Coffee Break | Hall de los Pasos Perdidos |
| 10:30am-11:20am | Plenary: David Simchi-Levi | Salón de Actos |
| 11:30am-1:00pm | Technical Sessions (TB) | Floors 1,2 \& 3 |
| 1:20pm-2:50pm | Technical Sessions (TC) | Floors 1,2 \& 3 |
| 3:00pm-3:50pm | Keynote: Paul Glasserman | Aula Magna |
| 3:00pm-3:50pm | Keynote: Ralph Keeney | Auditorio |
| 3:50pm-4:20pm | Coffee Break | Hall de los Pasos Perdidos |
| 4:20pm-5:50pm | Technical Sessions (TD) | Floors 1,2 \& 3 |
| 8:00pm-11:30pm | Señor Tango Dinner Show - advance payment tickets were required for |  |
|  | this event- see p.17 for information. |  |

WEDNESDAY, JUNE 9

| 8:00am-3:00pm | Registration | Hall de los Pasos Perdidos |
| :--- | :--- | :--- |
| 8:30am-10:00am | Technical Sessions (WA) | Floors 1,2 \& 3 |
| 9:00am-12:00pm | Exhibits | Hall de los Pasos Perdidos |
| 10:00am-10:30am | Coffee Break | Hall de los Pasos Perdidos |
| 10:30am-11:20am | Plenary-IFORS Lecture: Garrett van Ryzin | Salón de Actos |
| 11:30am-1:00pm | Technical Sessions (WB) | Floors 1, 2 \& 3 |
| 1:20pm-2:50pm | Technical Sessions (WC) | Floors 1, 2 \& 3 |
| 3:00pm-3:50pm | Keynote: Egon Balas | Aula Magna |
| 3:00pm-3:50pm | Keynote:Christopher Tang | Auditorio |
| 3:50pm-4:20pm | Coffee Break | Hall de los Pasos Perdidos |
| 4:20pm-5:50pm | Technical Sessions (WD) | Floors 1, 2 \& 3 |

## Bienvenidos - Welcome - Bemvindos ALIO/INFORMS Joint International Meeting

It is my pleasure to welcome all of you to Buenos Aires and to the ALIO/INFORMS Joint International Meeting. We are joining here for the first time CLAIO, the biannual Latin American Operations Research conference organized by ALIO, with the INFORMS International Meeting. We are also hosting the Teaching Effectiveness Colloquium and 7th ESICUP Meeting as meetings within a meeting.

Buenos Aires is an alive, dynamic, modern city. You will surely enjoy its environment, and the wide range of cultural and commercial choices offered: musical shows, theaters, any type of restaurant you can name, and a very vibrant nightlife.

I would like to take this opportunity to thank all authors for your contribution and participation. We have presentations that cover a wide range of subjects on basic research as well as report results on the practice of OR/MS. Special thanks goes to those very distinguished researchers that are honoring our conference giving Plenary and Keynote talks as well as Tutorials. Attending these talks is an extraordinary opportunity for all of us but mainly for Latin Americans.

A conference program such as this one, that includes more than 1000 presentations organized in more than 300 sessions, invited and contributed, could not have been put together without the work of many people. Members of the program committee, chairs of contributed and invited clusters, invited session chairs worked hard for this result. Among these, I would like to give a special mention to Celso Ribeiro who organized an extraordinary tutorials program, to Andrés Weintraub and Nelson Maculan, Plenary Co-Chairs and to Lorena Pradenas and Marita Urquhart, Publications Co-Chairs. I would like to also mention the enthusiastic contribution of several young cluster chairs, former students of our school, and now my colleagues, professors in Argentina and abroad. I am grateful also to professors and students of my research group for their permanent support.

And last, but not least, I have to recognize INFORMS meetings staff and SADIO staff for their hard work in organizing this meeting. To organize at such distance putting together two different organizational and country cultures has been a real challenge. Thanks also to our main sponsors: IBM, LINDO and the Ministerio of Ciencia, Tecnología e Innovación Productiva of Argentina.

We received submissions from people coming from more than 50 different countries. I am sure that the ALIO/INFORMS meeting will offer all of you a forum for rich intellectual exchange. But I hope you will also be able to take advantage of the opportunity to tour Buenos Aires and perhaps to spend a few days after or before the conference exploring some of the other beautiful cities and natural beauties of Argentina.

Again, welcome and enjoy the conference, Buenos Aires and Argentina!!


General and Program Chair

## SPEAKER GUIDELINES

## Audio-Visual Services

All session rooms will be equipped with LCD (computer) projectors, but please note that you must provide your own computer or pre-arrange to share with others in your session. Please note that overhead projectors will NOT be available. Please follow these guidelines to ensure a successful presentation.

- Bring your laptop to your session. We recommend that you pre-arrange with other speakers in your session to ensure that at least one of you brings a laptop from which you can project your talks.
- Bring your power supply cord with you.We recommend that you do not attempt to run your presentation off the laptop battery.
- You may need an adaptor to connect your computer to the local voltage (220) in Argentina.
- If your laptop is a Mac, you will need the appropriate adapter for the external video output.
- Arrive at your session at least 10 minutes before it begins. All presenters in a session should set up and test the connection to the projector before the session begins.
- We encourage speakers to put their presentations on a USB data stick as a backup.


## Presentation Guidelines

The room and location of your session are listed in the Technical Sessions section and in the Master Track Schedule. Please be on time for your session and check in with the session chair.

- Presentations are expected to be in English.
- Limit the presentation to key issues with a brief summary.
- Time your presentation to fit within your designated time span and allow some time for audience questions.
- You may bring copies of your paper or other handouts to distribute to the audience.
- No proceedings with complete papers are produced for this meeting. To obtain complete copies of any papers abstracted in the program, please contact the authors directly at the address supplied with each abstract.
- Presenters have the opportunity to submit their papers to special issues of Annals of Operations Research, Journal of Memetic Computing or ITOR. Go to the ALIO-INFORMS International Meeting website for information.


## Questions about the Program, Last-Minute Presentation Changes or Cancellations

Come to the ALIO-INFORMS Registration Desk if you have general questions about the meeting and/or questions about your own presentation.

## For Assistance During Your Session: Session Monitor Desks

Session Monitor Desks are located in several areas (see map for specific locations). If you have a problem in your session room related to AV needs or any other requests, go to the Session Monitor Desk in the area to ask for assistance.

## SESSION CHAIR GUIDELINES

The role of the Chair is to coordinate the smooth running of the session. The Chair:

- Begins and ends each session on time. This is very important. We have a very tight schedule and we need to free the rooms before 6:00pm for other events.
- Introduces each presentation (just the title of the paper and the name of the presenting author).
- Ensures that presentations are made in the order shown in the program. This allows for"session jumping." If a speaker cancels or does not attend, the original time schedule should be adhered to rather than sliding every talk forward.
- Completes the session attendance form (forms will be in the room).
- We ask Session Chairs to notify us about any lastminute changes or cancellations; these changes will be posted outside the meeting rooms.


## PUBLICATIONS

Several journals will be publishing special issues to include papers from the ALIOINFORMS Joint International Meeting.
ALIO-INFORMS authors are invited to submit papers for these special issues. The journals include:

- Annals of Operations Research
- Journal of Memetic Computing
- International Transactions in Operational Research
Complete details on submitting your paper to any of these journals can by found at the ALIO-INFORMS meeting website at http://meetings2.informs.org/buenosaires2010/ and follow the Publications link from the menu on the left.


## REGISTRATION \& GENERAL INFORMATION

## Messages

The best way for people to reach you is to contact you directly at your hotel. Please leave your hotel phone number with your colleagues and family members. Messages can be posted on a message board located near registration; you can contact colleagues attending the meeting using this message board. Please check the message board periodically to see if you have received a message.

## Badges Required for Technical Sessions

ALIO-INFORMS International badges must be worn to all sessions and events. Attendees without badges will be directed to the registration desk to register and pick up their badges. All attendees, including speakers and session chairs, must register and pay the registration fee.
Your registration fee includes admittance to the complete technical program. Also included are the Sunday evening Welcome Reception, and all morning and afternoon coffee breaks. No other meals are included.

## Internet

Free wireless Internet is available in some areas of the first floor of the Law School. Internet shops (Locutorios) can be found everywhere in Buenos Aires, and are very inexpensive.

## Lunch/Food

There is a restaurant on the ground floor of the Law School (Facultad de Derecho) where you can purchase a hot meal, sandwiches, coffee and soft drinks. The restaurant is open from Monday to Wednesday, all day. There are also vending machines near the restaurant; these are available all week, including Sunday. In addition, there are numerous coffee shops, fast food and restaurants in various price ranges located around the Law School (within 200-300 meters).

## MONDAY

## WELCOME \& PLENARY

## 10:30am-11:20am

Salón de Actos

## Optimization in Sports: Scheduling the Major Football League in Brazil

Celso Ribeiro
Professor
Universidade Federal Fluminense, Brazil
We survey the field of optimization in sports and, in particular, the use of mathematical programming and heuristic search methods to schedule professional sports leagues. We describe the integer program-ming-based system developed for scheduling the yearly national tournament of the major football league in Brazil and we report on the successful practical experience observed after two years running the system.


Celso Ribeiro is full
Professor at the Department of Computer Science of Universidade Federal Fluminense. He chaired the Departments of Electrical Engineering
(1983-1987) and
Computer Science (19931995) of the Catholic University of Rio de Janeiro. He has a bachelor degree in Electrical Engineering and a M.Sc. degree in Systems Engineering. He obtained his doctorate in Computer Science at the Ecole Nationale Supérieure des Télécommunications in 1983. His research is supported by the Brazilian Council of Scientific and Technological Development and by the Rio de Janeiro State Foundation for Research Support (FAPERJ). Dr. Ribeiro was President of the Brazilian Operations Research Society (SOBRAPO, 1989-1990) and President of the Latin-American Association of Operations Research Societies (ALIO, 1992-1994), and Vice-President of IFORS (19982000). He is the editor of four books and the author of more than 120 papers in international journals and book chapters. He is an Associate Editor of the journals Parallel Computing, Journal of Heuristics, Pattern Recognition, Discrete Optimization, and RAIRO Recherche Opérationnelle. Dr. Ribeiro is currently the General Editor of the journal International Transactions in Operational Research. He also chaired the Department of Modernization Programs of the Brazilian Ministry Education (April 2005-April 2007).

KEYNOTE
3:00pm-3:50pm Aula Magna

## Applications of OR in Portfolio Management

 Sebastián CeriaPresident and CEO
Axioma, Inc., USA
In this talk we will survey some of the current applications of OR in equity portfolio management. We will describe the steps in the portfolio management workflow and discuss how OR techniques are currently applied to provide valuable insights and decision support in each of these steps for the largest investment firms around the globe. The talk will emphasize two areas in particular, risk management and portfolio construction, and will describe how analytics firms like Axioma leverage OR techniques to provide state-of-the-art decision support tools. We will provide a brief overview of equity factor models, and how they are used to predict the risk of equity portfolios. We will discuss how optimization is used as the main decision support engine for quantitative portfolio construction, and how risk models interact with optimizer in order to provide the optimal tradeoff of risk and return. Finally, we will discuss the challenges that arise when using OR tools in portfolio management and the criticisms that are most frequently voiced against the value of such techniques.


Sebastián Ceria is one of the world's foremost authorities on optimization. He is the President and CEO of Axioma, Inc., a private, New York based company providing the financial services industry with advanced optimization and risk management technology and consulting services. Before founding Axioma, Dr. Ceria was an Associate Professor of Decision, Risk and Operations at Columbia Business School (1993-1998), where he was honored with the prestigious Career Award for Operations Research from the National Science Foundation. Most recently, Dr. Ceria's work has focused on the area of robust optimization. He has co-authored numerous papers on the topic, including, "Incorporating Estimation Errors into Portfolio Selection: Robust Portfolio Construction," which was published in The Journal of Asset Management. He also co-authored the chapter,"Robust Optimization," for the upcoming Oxford Handbook of Quantitative Asset Management. Dr. Ceria completed his PhD in Operations Research at the Carnegie Mellon University Graduate School of Industrial Administration.

## KEYNOTE

3:00pm-3:50pm

## Auditorio

## Some Epiphanies on OR Education

James Cochran
Bank of Ruston Endowed Research Professor of Quantitative Analysis and Computational Modeling Senior Scientist, Center For Information Assurance Louisiana Tech University, USA
We in the $O R$ community understand that $O R$ is an inherently interesting, relevant, important and enjoyable discipline - unfortunately many of our students (particularly those in introductory OR courses) don't seem to share this understanding with us! So how do instructors of OR help students appreciate that $O R$ is interesting and relevant and important and enjoyable? Dr. Cochran discusses several epiphanies he has experienced while teaching introductory or courses that he believes can lead to more effective accomplishment of these goals and improve students' comprehension and retention of course material. Throughout the session he will emphasize his points with live demonstrations and discussions of several interesting and novel active learning exercises and cases. Card tricks, classroom versions of television game shows, and a teaching case with integrated active learning will be featured. Because many of these exercises are easily transferable across topics, instructor/classroom styles, cultures, national borders, institutions, faculties, programs, and class sizes, it is very likely you will walk away from this session with ideas on how to improve your own teaching (indeed, Dr. Cochran will be very disappointed if you don't!!).


James J. Cochran also
serves as Senior Scientist/Analytic Group Director, Center for Secure Cyberspace at Louisiana Tech University. He holds a BS, MS and MBA (Wright State University), and a PhD (University of Cincinnati). In 2008 he was awarded the INFORMS Prize for the Teaching of OR/MS Practice. His research interests include sample based and Bayesian optimization, statistical methods, statistical learning and information assurance. Dr. Cochran has been published in Management Science, The American Statistician, Journal of the Operational Research Society, Interfaces, and many more. He is the Editor-in-Chief of INFORMS Transactions on Education. He is the founding chair of the INFORMS Section, OR in SpORts. He established and organized the INFORMS Teaching Effectiveness Colloquium series and annual Case Competition as well as the annual INFORMS/IFORS International Education Workshop series. Dr. Cochran also organized and chaired the 2008 ORPA Conference on Using Operations Research to Address Urban Transport and Water Resource Management Issues in Africa. He has served on the Editorial Boards for Interfaces, ORiON, Journal of the Chilean Institute of Operations Research, Decision Sciences, Operations Management Education Review, and the Journal of Quantitative Analysis in Sports.

## TUESDAY

## PLENARY

10:30am-11:20am
Salón de Actos

## Creating Value in a Volatile World

David Simchi-Levi
Professor
Massachusetts Institute of Technology, USA
With the economic recession in full swing, supply chain managers are facing a growing array of risks. Fluctuating transportation costs, high volatility in demand volume and mix, commodity price volatility, increase in labor costs in developing countries and the pressure to reduce inventories are just a few of the challenges that companies are struggling to overcome today and will likely face in the future. In such an environment it is important to focus on three dimensions: cost, cash and service. That is, it is important to identify strategies to reduce cost and cut working capital (cash) while at the same time maintain or increase service levels. Of course, the increase in volatility and risks demands strategies that, while reducing cost and working capital, allow the firm to better respond to changes in demand volume and mix, exchange rates, technology or labor costs. In particular, it is important to implement a strategy that allows the firm to cut costs while at the same time prepare for growth. This is the focus of our talk.


David Simchi-Levi is
Professor of Engineering Systems at MIT, editor-inchief of Operations Research, the flagship journal of INFORMS, and coauthor of Designing and Managing the Supply Chain, The Logic of Logistics and Operations Rules. He is the founder of LogicTools (now a division of IBM's ILOG), which provides software solutions and professional services for supply chain planning.

## KEYNOTE

3:00pm-3:50pm
Aula Magna

## Valuing the Treasury's Capital Assistance Program

## Paul Glasserman

Jack R. Anderson Professor of Business
Columbia University, USA
The Capital Assistance Program (CAP) was created by the U.S. government in February 2009 to provide backup capital to large financial institutions. The terms of the CAP involve embedded options for both the Treasury and participating bank. We develop a framework to value these CAP securities. The interaction between the competing options held by the buyer and issuer of these securities creates a game between the two parties, and our approach captures this strategic element of the joint valuation problem. We apply our method to the eighteen publicly held bank holding companies that participated in the stress test launched together with the CAP.We compare our estimates with abnormal stock price returns for the stress test banks at the time the terms of the CAP announced and find a correlation of about 0.8. We also discuss potential lessons learned from this program. This is joint work with Zhenyu Wang of the Federal Reserve Bank of New York.


Paul Glasserman was at Bell Laboratories prior to joining Columbia University. He has also held visiting positions at Princeton University and NYU. His research and teaching address risk management, the pricing of derivative securities, Monte Carlo simulation, statistics and operations. His publications include the book Monte Carlo Methods in Financial Engineering (Springer, 2004), which received the 2006 Lanchester Prize and the 2005 I-Sim Outstanding Publication Award. Dr. Glasserman is a recipient of many awards, including IBM University Partnership Awards, the Erlang Prize (1996), the IMS Medallion from the Institute of Mathematical Statistics (2006), and a fellowship from the FDIC Center for Financial Research (2004). He received the 2004 Wilmott Award for Cutting-Edge Research in Quantitative Finance and Risk Magazine's 2007 Quant of the Year Award. He serves on the editorial boards of Finance \& Stochastics, Mathematical Finance, the Journal of Computational Finance, and the SIAM Journal on Financial Mathematics. He is a member of the

Education and Standards Committee of PRMIA, the Professional Risk Managers International Association. Dr. Glasserman was senior vice dean of Columbia Business School in 2004-2008 and served as interim director of the Sanford C. Bernstein \& Co. Center for Leadership and Ethics in 2005-2007.

## KEYNOTE

3:00pm-3:50pm Auditorio

## Practical Models for Group Decisions

Ralph L. Keeney
Research Professor of Business Administration Duke University, Fuqua School of Business, USA

Many decisions are made by groups of individuals. If a group decision is complex and important, then an analysis that explicitly addresses the complexities may provide insights well worth the effort. A group decision analysis can be done directly by the group as a whole or indirectly by integrating initial analyses of the decision by each group member to provide insight for the group choice. In both cases, the foundation for analyzing the group decision is that each individual believes that the principles of decision analysis are appropriate for that decision. The presentation begins by defining what is meant by a group decision problem. Specifically, a group decision in this presentation has three important properties: (1) a group of two or more members has the responsibility for making the decision; (2) they collectively must select among a single set of alternatives; and (3) all experience the same set of consequences from the chosen alternative. This definition excludes negotiations among individuals within a group and choices involving the division of consequences (e.g. risk sharing). Except that a group has responsibility for the choice, this group decision is essentially the same concept as an individual decision, as an individual cannot negotiate or share risks with him or herself. For this group decision, the principles for modeling it are next presented. Then specific decision models that follow from those principles are discussed, and it is indicated how these models explicitly address the complexities in group decisions. Procedures to implement the models are subsequently described.


Ralph L. Keeney
received a BS from the University of California at Los Angeles, and a PhD from MIT. His research interests are the areas of decision-making and risk analysis, with a focus on problems involving multiple objectives. He has applied such work as a consultant for several private and public organizations addressing corporate management problems, environmental and risk studies, energy policy, and decisions about siting large facilities. Prior to joining the Duke faculty, he was a faculty member in Management and Engineering at MIT and at the University of Southern California, a Research Scholar at the International Institute for Applied Systems Analysis in Austria, and the founder of the decision and risk analysis group of a large geotechnical and environmental consulting firm. Dr. Keeney is the author of many books and articles, including Decisions with Multiple Objectives (co-authored with Howard Raiffa), which won the ORSA Lanchester Prize, and Smart Choices: A Practical Guide to Making Better Decisions (with John S. Hammond and Howard Raiffa), which also received the Decision Analysis Society Best Publication Award and has been translated into fifteen languages. Dr. Keeney is a Member of the U.S. National Academy of Engineering.

## WEDNESDAY

## IFORS DISTINGUISHED LECTURE

10:30am-11:20am
Salón de Actos

## Choice-Based Revenue Management

Garrett van Ryzin
Paul M. Montrone Professor of Private Enterprise Columbia University, USA
Using consumer choice models as a basis for revenue management (RM) is appealing on many levels. Choice models can naturally model important buy-up and diversion phenomenon and can be applied to newer, undifferentiated low-fare structures and dynamic pricing problems. And recent research advances have now brought choice-based RM within striking distance of being truly practical. In this talk, we survey the recent research results in this area and discuss their implications for RM research and practice.


Garrett Van Ryzin is the Paul M. Montrone Professor of Private Enterprise at the Columbia University Graduate School of Business. His research interests include stochastic optimization, pricing and revenue management and supply chain management. He is co-author (with Kalyan Talluri) of the book, The Theory and Practice of Revenue Management and is Area Editor for Revenue Management at Operations Research.

## KEYNOTE

3:00pm-3:50pm
Aula Magna

## Sharper Cuts for Mixed-Integer Programs: Recent Developments

Egon Balas
University Professor of Industrial Administration and Applied Mathematics
Thomas Lord Professor of Operations Research Carnegie Mellon University, USA
We will discuss recent progress in cut generating techniques for mixed integer programs, including some new variants of lift-and-project cuts generated from the simplex tableau of the linear programming relaxation.


Egon Balas has a doctorate in Economic Science from the University of Brussels and a doctorate in Mathematics from the University of Paris. His research interests are in mathematical programming, primarily integer and combinatorial optimization. He has played a central role in the development of enumerative and cutting plane techniques for 0-1 programming. In the mid-sixties he wrote a pioneering paper on implicit enumeration, which later became a Citation Classic as the most frequently cited paper of the journal Operations Research between 1954 and 1982. In the 1970s he developed a theory for optimization over unions of polyhedra, known as disjunctive programming. In the 1980s he followed this up with the approach known as extended formulation or lifting followed by projection. In the 1990s Dr. Balas and his coworkers developed the cutting plane approach known as lift-and-project, an outgrowth of disjunctive programming. In 1980 he received the US Senior Scientist Award of the Alexander von Humboldt Foundation. In 1995 he was awarded the John von Neumann Theory Prize of INFORMS, and in 2001 he received the EURO Gold Medal of the European Association of Operational Research Societies. In 2006 he was inducted into the National Academy of Engineering and into the IFORS Hall of Fame.

## KEYNOTE

3:00pm-3:50pm
Auditorio

## Marketing-Operations Interface Models: From Coexistence to Coordination and Collaboration

Christopher S. Tang
Edward Carter Professor of Business Administration UCLA Anderson School of Management, USA
Marketing and operations are two key functional areas that contribute to the success of a firm. By acquiring and analyzing information regarding customers and competitors, marketing can be viewed as an external-focused functional area that determines "what" kind of products (or services) a company should provide through "which" channel at "what" price. By viewing this marketing plan as the "demand" from an internal customer, operations is by-and-large an internal-focused functional area that examines "how" to deliver this demand by using internal or external resources. Due to their
inherent roles and responsibilities, coordination and collaborations between marketing and operations areas can be difficult in practice. As such, the conflict between marketing and operations arises when the operation's "supply" does not meet the marketing's "demand." Over the last two decades, researchers have developed different quantitative models to examine the issue of coordination/collaboration in the context of marketing operations interfaces. The intent of this presentation is twofold. We present a unified framework for classifying various marketing-operations interface models that may serve as a guide to navigate through the sea of research articles in this important area. Also, by examining some missing gaps, we discuss some topics for potential future research.


Christopher S. Tang received his BSc from King's College, University of London, and MA, MPhil and PhD from Yale University. He also served as Senior Associate Dean at the UCLA Anderson School from 1998 to 2002, and as Dean of the Business School at the National University of Singapore from 2002 to 2004. His research work deals with complex issues arising from production planning, supply chain management and the marketing/manufacturing interface. He has co-edited three books and four special issues. In addition, he has published over 70 articles in journals such as Management Science, Operations Research, Manufacturing and Service Operations Management and Sloan Management Review, and newspaper articles in the Wall Street Journal and Financial Times. Dr. Tang has served on editorial boards for over 15 journals, including Management Science, Operations Research and Production and Operations Management. In addition to his academic teaching experience at Hong Kong University of Science and Technology, National University of Singapore, Stanford University, and UCLA, he has taught at various executive programs throughout Asia, Europe and the Americas. He has advised over 20 multi-national firms such as Amgen, Hewlett Packard Company (world-wide locations), Honda America, Nestlé USA and IBM (world-wide locations).

All tutorials take place in Aula Magna First Floor.

- SA01


## Practical Financial Optimization: Decision

Making for Financial Engineers
Stavros Zenios
University of Cyprus, Cyprus
Optimization of financial decision-making has evolved into a powerful practical tool over the last twenty years, following its theoretical foundation more than half a century ago. And while it has done much good to governments, institutions and individuals alike, in the current economic crisis financial engineers have played a major catastrophic, if unwittingly, role. It is a prime example of good tools being put to bad use. In this tutorial we will survey the state of the art in practical models for financial decision-making. We will draw upon examples from: insurance, individual investors, population ageing, corporate debt management and sovereign debt management. A web-based library of models that are available for ready use by researchers and students alike will be discussed. However, emphasis will also be placed on the pitfalls of using the models blindly. The need for auditing models not only for their technical soundness but also in the Socratic maxim "to be without self reflection is not to be" will be highlighted.

## - SB01

## OR Challenges Arising from Solving Industrial

 ApplicationsMikael Rönnqvist
Norwegian School of Economics and Business, Norway
When implementing decision support systems in practice, there are often a number of special aspects and requirements that must be considered. Many of these can be very challenging from an OR perspective and/or are counterproductive or non-logical for optimality. In this tutorial, we will describe and discuss a number of such industrial examples. We discuss the reasons behind the requirements, the OR challenge, how they were approached and implemented, and the results and general experiences made. The applications cover operational and real time applications for several areas including routing, inventory and process control.

- SCO1


## Metaheuristics for Multi-Objective Optimization

El-Ghazali Talbi
University of Lille-INRIA-CNRS, France
This tutorial presents an overview of metaheuristics for multi-objective optimization. A substantial number of metaheuristics for multi-objective problem solving has been proposed so far, and an attempt on unifying existing approaches is presented. Based on a fine-grained decomposition and following the main issues of fitness assignment, diversity preservation and elitism, a conceptual global model is proposed and is validated by regarding a number of state-of-the-art algorithms as simple variants of the same structure. The presented model is then incorporated into a general-purpose software framework dedicated to the design and the implementation of evolutionary multi-objective optimization techniques: ParadisEO-MOEO. This package has proven its validity and flexibility by enabling the resolution of many real-world and hard multi-objective optimization problems.

- SD01


## Revenue Management

Peter Bell
University of Western Ontario, Canada
This presentation aims to provide an understanding of the practice of revenue management (RM) as it is carried out today, and to demonstrate the basic concepts used to enhance firm revenues while selling the same quantities of products. The five major tools of the revenue manager (pricing, product protection, trading-up, overbooking and short selling) will be reviewed and the underlying concepts discussed. Opportunities to contribute to research and practice in RM will be highlighted.

- MA01

Multi-Criteria Path and Tree Problems: Discussion on Exact Algorithms and Their Applications
João Clímaco
University of Coimbra, Portugal
Multi-criteria path and tree models are useful in many applications. Particularly, in Internet routing they seem very promising. In the first part of this tutorial we classify and present the main exact approaches dealing with several MC path problems putting in evidence the shortest path problems. In the second part of the tutorial we present exact algorithms dedicated to some MC tree problems, namely the minimal spanning tree and the minimal cost/minimal label spanning tree problems. Finally, the potentialities and limitations of these approaches are discussed and exemplified.

- MB01

Combinatorial Benders Approaches to Hard Problems
Michael Trick
Carnegie Mellon University, USA
Benders decomposition is an old idea in integer programming. In a Benders approach, there are two types of variables: master variables and subproblem variables. Recent work has shown the value of this approach even in cases where the subproblem has no defined dual values, as is needed in classical Benders. This approach has been shown to be very successful in a variety of machine planning, sports scheduling, transportation and other problems. I'll outline the basics of the approach and show a variety of applications where it has been used.

- MC01

Black Swans, New Nostradamuses, Voodoo Decision Theories, and the Science of Decision-Making in the Face of Severe Uncertainty
Moshe Sniedovich
The University of Melbourne, Australia
The recent global financial crisis, natural disasters, and the ongoing debate on global warming and climate change, are just three reminders of how large severe uncertainty looms in human affairs: in the lives of individuals, and in the national and international socio/political/economic spheres. In this tutorial we examine the challenge (and opportunity) that severe uncertainty presents in decision and policy making. An important aspect of this discussion will be an examination of the blatant contradiction between expert-views in this area.

- MD01


## An Overview of Humanitarian (Operations) Research

Luk N. Van Wassenhove, INSEAD, France
Recent events have made it perfectly clear that both the frequency and intensity of humanitarian disasters have increased. The year 2005 has been a particularly dark one in terms of number of people killed or otherwise affected (tsunami, Katrina, Pakistan, Darfur). In Indonesia, one-third of the relief supplies were still blocked at the airport three months after the tsunami, while in Pakistan one million people were still waiting for winter tents more than a month after the earthquake. Similar challenges were faced in Haiti in early 2010. At the core of these are fundamental supply chain management problems (bottlenecks, procurement issues, tracking and tracing problems). The world of humanitarian disaster logistics is different from the familiar context of business logistics. Humanitarians operate in very dynamic environments and need to preserve a humanitarian space (respecting the principles of impartiality, neutrality and humanity). This space is increasingly challenged by political and
military forces, to the point that security of humanitarian personnel has become a key concern. Since traditional funding sources are declining, and natural and man-made disasters become more frequent, humanitarian organizations realize that they will have to increasingly rely on private organizations for help. Simultaneously, companies in search of a coherent corporate social responsibility agenda increasingly turn to the humanitarian world. However, it is far from obvious how private companies and humanitarian organizations can effectively work together in disaster relief.This presentation will introduce supply chain management in the humanitarian context, and outline the need for better preparedness and response to disasters. We also discuss opportunities for more effective collaboration among humanitarian organizations, as well as between humanitarians and private organizations. The presentation uses a number of real cases to highlight opportunities to do interesting research with a high potential impact.

- TA01


## Metaheuristics for Optimization Problems in Communication Networks

Simone Martins
Universidade Federal Fluminense, Brazil
Huge advances in communication networks have been achieved in recent years and some hard optimization problems in areas such as network design and routing have been treated. Metaheuristics are high-level procedures that coordinate simple heuristics to find good approximate solutions to computationally difficult combinatorial optimization problems. In this tutorial, the principles associated with some of the main metaheuristics are reviewed and some successful applications of them to optimization problems in telecommunications, computer communications, and network design and routing are presented.

- TB01

Vehicle Routing Problems with Split Deliveries
Maria Grazia Speranza
Università degli Studi di Brescia, Italy
In the vehicle routing problem (VRP) the objective is to find a minimum cost set of routes serving all customers where the demand of each customer is not greater than the vehicle capacity and where each customer is visited exactly once. In the split delivery vehicle routing problem (SDVRP) the restriction that each customer is visited once is relaxed. Moreover, the demand of each customer may be greater than the capacity of the vehicles. The SDVRP is NP-hard, even under restricted conditions on the costs, when all vehicles have a capacity greater than two, while it is solvable in polynomial time when the vehicles have a maximum capacity of two. To better understand the relations between the VRP and the SDVRP, the complexity of the two problems on specific structures on the underlying graph will be discussed. It turns out that on these structures the SDVRP is never harder than the VRP. The cost saving that can be obtained by allowing split deliveries can be up to $50 \%$ of the cost of the optimal solution of the VRP. The variant of the VRP in which the demand of a customer may be greater than the vehicle capacity, but where each customer has to be visited a minimum number of times, will also be considered. The cost saving that can be obtained by allowing more than the minimum number of required visits can be again up to $50 \%$. Simple heuristics that serve the customers with demands greater than the vehicle capacity by full load out-and-back trips until the demands become less than the vehicle capacity may generate solutions that cost in the worst-case twice the cost of the optimal solution. Finally, the state of the art of exact and heuristic algorithms will be presented. Exact branch-and-price algorithms can solve instances of small size only, while several effective heuristics are available. The impact of split deliveries on some vehicle routing problems with profits will also be discussed. The capacitated team orienteering problem (CTOP) and the capacitated profitable tour problem (CPTP), where each customer must be visited exactly once, will be compared with the same problems where each customer may be visited by several vehicles, if beneficial. Given a limited fleet of capacitated vehicles, in the CTOP and in the CPTP a set of potential customers with associated profit is given from which a subset must be selected. In the CTOP we maximize the total collected profit and a time limit of each route is given, while in the CPTP the objective is the maximization of the difference between the collected profit and the travelling cost. It will be shown that allowing split deliveries may double the profit collected.

- TCO1

Cliques, Quasi-Cliques and Clique Partitions in Graphs
Panos Pardalos
University of Florida, USA
During the last decade, many problems in social, biological and financial networks required finding cliques or quasi-cliques. Cliques or clique partitions have also been used as clustering or classification data mining tools in data sets represented by networks. These networks can be very large and often massive, and therefore external (or semi-external) memory algorithms are needed. We discuss applications, algorithms and computational approaches for all types of problems.

## - TD01 <br> Staffing and Scheduling Optimization in Call Centers

Pierre L'Ecuyer, Wyean Chan
Université de Montréal, Canada
We review some important modeling and optimization problems arising in call centers, and we discuss the development of efficient optimization tools. We argue that for the large modern call centers that must handle different call types and where the agents have different combinations of skills, efficient simulation tools and simulation-based optimization algorithms are needed. We illustrate this with the problem of staffing and scheduling agents under various types of constraints, as well as with call routing problems.

- WA01

Fragile Networks: Identifying Vulnerabilities and Synergies in an Uncertain Age Anna Nagurney University of Massachusetts, USA
The growing number of disasters globally has dramatically demonstrated the dependence of our economies and societies on critical infrastructure networks. At the same time, the deterioration of the infrastructure from transportation and logistical networks to electric power networks due to inadequate maintenance and development as well as to climate change has resulted in large societal and individual user costs. This tutorial will focus on recently introduced mathematically rigorous and computer-based tools for the assessment of network efficiency and robustness, along with vulnerability analysis. The analysis is done through the prism of distinct behavioral principles, coupled with the network topologies, the demand for resources, and the resulting flows and induced costs. This tutorial will be conducted in three modules. The first module will focus on the network fundamentals, the efficiency measurement through a recently introduced unified network performance measure and the vulnerability analysis. The second module will illustrate the concepts in the context of congested transportation networks, supply chains under disruptions, financial networks, and dynamic networks such as the Internet and electric power networks. The third module will further explore the connections between transportation networks and different network systems and will quantify synergies (including cost and environmental ones) associated with network integration, ranging from corporate mergers and acquisitions to collaboration among humanitarian organizations. Once the tutorial is completed, the participants will be able to identify which nodes and links truly matter in network systems and their rankings. Such nodes and links should be better maintained and protected since their deterioration or outright removal/destruction has the biggest impact on network performance. They will also be able to understand and appreciate the commonality among different network systems that underpin both modern and developing societies. The tutorial will be based on the research results described in the recent book, Fragile Networks: Identifying Vulnerabilities and Synergies in an Uncertain World, by Anna Nagurney and Qiang "Patrick" Qiang, John Wiley \& Sons, 2009.

- WB01

Dynamic Games in Finance
Michèle Breton
HEC Montréal, Canada
This tutorial presents various applications of dynamic games in the area of finance. Models in corporate finance include default decisions, callable debt evaluation, capital investment and asset substitution problems. Models in investment finance include robust portfolio optimization and competition between funds or financial institution. We will also present game options and derivative pricing applications involving more than one interacting player. Finally, we will review some topics in the area of financial services and markets, and give a brief overview of real option game models.

- WC01

Minimizing Closed Curves with Constrained Curvature: The Dubins Traveling Salesman Problem
Sebastián Urrutia
Universidade Federal de Minas Gerais, Brazil
Dubins' vehicles describe curves of bounded curvature. In this tutorial we tackle the Traveling Salesman Problem for Dubins' vehicles. After reviewing the related literature, we propose a new heuristic algorithm to the problem. Solutions to an angular version of the Traveling Salesman Problem are used to compute the tour. In order to calculate the point-to-point trajectories we apply a shortest path algorithm on a discretized search space. The new algorithm is compared to the best algorithm found in the literature.

## SUNDAY

| Track | Room | $\begin{gathered} \text { SA } \\ \text { 10:00-11:30 } \\ \hline \end{gathered}$ | $\begin{gathered} \text { SB } \\ 11: 45-1: 15 \end{gathered}$ | $\begin{gathered} \text { SC } \\ \text { 2:30-4:00 } \end{gathered}$ | $\begin{gathered} \text { SD } \\ 4: 30-6: 00 \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Aula Magna - 1st Fl. | Tutorial | Tutorial | Tutorial | Tutorial |
| 2 | $360-3 \mathrm{rdFl}$. | No Session | OR/MS for Disaster Mgt. | OR/MS for Disaster Mgt. | OR/MS for Disaster Mgt. |
| 3 | 361-3rd Fl. | Health Care I | Health Care II | Education \& Distance Learning | Software Tutorial: IBM |
| 4 | 372-3rd Fl. | OR Applications I | OR Applications II | OR Applications III | Industrial Apps.I |
| 5 | Velez Sarfield - 2nd Fl. | Revenue Mgt. \& Pricing | Revenue Mgt. \& Pricing | Revenue Mgt. \& Pricing | Revenue Mgt. |
| 6 | $352-3 \mathrm{rdFl}$. | Electrical Markets | Accounting | Cost/Performance Analysis | Professional Issues |
| 7 | 353-3rd Fl. | Multiobjective Scheduling | No Session | Special Invited: Planning \& Sched. Ind. Processes I | Special Invited: Planning \& Sched. Ind. Processes II |
| 8 | $355-3 \mathrm{rdFl}$. | Decision Support Systems | Decision Analysis | Decision Analysis | Decision Analysis |
| 9 | $356-3 \mathrm{rdFl}$. | Statistics | Applied Probability | Queueing Systems | Analytic Hierarchy Process |
| 10 | $357-3 \mathrm{rdFl}$. | INFORMS Computing Society | INFORMS Computing Society | Special Invited: Graph Spectra-Apps. Comb.Opt.I | Special Invited: Graph Spectra-Apps. Comb. Opt.II |
| 11 | 362 - 3rd Fl. | Nonlinear Optimization | Nonlinear Optimization | Nonlinear Optimization | Nonlinear Optimization |
| 12 | 363-3rd Fl. | Special Invited: Supply Chain Mgt. | Supply Chain Mgt.I | Supply Chain Mgt. II | Special Invited: Risk in Global Supply Networks |
| 13 | $364-3 \mathrm{rdFl}$. | Sustainable Development | Supply Chain - Opt.I | Supply Chain - Opt. II | Supply Chain |
| 14 | $365-3 \mathrm{rdFl}$. | Game Theory \& Apps. | Game Theory \& Apps. | Game Theory \& Apps. | Game Theory \& Apps. |
| 15 | $351-3 \mathrm{rdFl}$. | Data Mining | Data Mining | Data Mining | Data Mining |
| 16 | $385-3 \mathrm{rdFl}$. | Heuristics | Metaheuristics | Metaheuristics | Metaheuristics |
| 17 | 387 - 3 rdFl . | Data Mining/ Machine Learning I | Neural Networks | Data Mining/ Machine Learning II | Artificial Intelligence |
| 18 | 384-3rd Fl. | No Session | Aviation Theory \& Apps. | Vehicle Routing I | Vehicle Routing II |
| 19 | $383-3 \mathrm{rdFl}$. | Transportation Science \& Logistics | Logistics/Vehicle Routing | Software Tutorial : FICO | Logistic/Vehicle Routing |
| 20 | 382 - 3rd Fl. | Manufacturing | Cutting \& Packing | 7th ESICUP | 7th ESICUP |

## MONDAY

| Track | Room | $\begin{gathered} \text { MA } \\ 8: 30-10: 00 \end{gathered}$ | $\begin{gathered} \text { Plenary } \\ \text { 10:30-11:20 } \end{gathered}$ | $\begin{gathered} \text { MB } \\ \text { 11:30-1:00 } \end{gathered}$ | $\begin{gathered} \text { MC } \\ 1: 20-2: 50 \end{gathered}$ | Keynotes 3:00-3:50 | $\begin{gathered} \text { MD } \\ 4: 20-5: 50 \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Aula Magna - 1st Fl. | Tutorial |  | Tutorial | Tutorial |  | Tutorial |
| 2 | Salón Rojo-1st FI. | OR for Developing Countries |  | OR for Developing Countries | OR for Developing Countries |  | OR for Developing Countries |
| 3 | Auditorio - 1st Fl. | Teaching Effectiveness Colloq. |  | Teaching Effectiveness Colloq. | Teaching Effectiveness Colloq. |  | Teaching Effectiveness Colloq. |
| 4 | Salón Azul-1st FI. | Industrial Apps. II | Welcome \& | Opt.-Practice \& Software | Opt.- Practice \& Software | Keynote | Opt.-Practice \& Software |
| 5 | Velez Sarfield - 2nd FI. | Multi-Criteria Decision Making I | Plenary | Multi-Criteria Decision Making II | Multi-Criteria Analysis \& Opt. | Sebastián Ceria | Multi-Criteria Analysis \& Opt. |
| 6 | 352-3rd Fl. | Economic Modeling | Celso Ribeiro | Finance: Banking \& Risk Mgt. | Financial Engineering | Applications of OR | Financial Modeling |
| 7 | 353-3rd Fl. | Project Mgt./Scheduling | Optimization | Timetabling | Inventory Mgt. | in Portfolio Mgt. | Production \& Inventory Systems |
| 8 | 355-3rd Fl. | Logistics/Vehicle Routing | in Sports | Decision Analysis | Decision Analysis I | Aula Magna | Decision Analysis II |
| 9 | 356-3rd Fl. | No Session | Salón de Actos | Stochastic Models \& Processes | Special Invited: Computational Stochastic Prog. |  | Simulation I |
| 10 | 357-3rd Fl. | Integer Programming |  | Integer Programming | Integer Programming I |  | Integer Programming II |
| 11 | 362-3rd Fl. | Nonlinear Opt. |  | Nonlinear Opt. | Nonlinear Opt. | Keynote | Nonlinear Opt. |
| 12 | 363-3rd Fl. | Special Invited: Agribusiness SC |  | Supply Chain Mgt. | Supply Chain Mgt. | James Cochran | Supply Chain Mgt. |
| 13 | 364-3rd Fl. | SCMgt. in Natural Resources |  | SCMgt. in Natural Resources | SC Mgt. in Natural Resources | Some Epiphanies | SC Mgt. in Natural Resources |
| 14 | 365-3rd Fl. | Game Theory \& Applications |  | Game Theory \& Applications | Game Theory/ Telecomm | on OR Education Auditorio | Game Theory/ Telecomm |
| 15 | 351-3rd Fl. | Data Mining |  | Data Mining | Data Mining |  | Data Mining |
| 16 | 385-3rd Fl. | Metaheuristics |  | Metaheuristics | Metaheuristics |  | Metaheuristics |
| 17 | 387-3rd Fl. | Women in OR/MS |  | Metaheuristics | Metaheuristics |  | Metaheuristics |
| 18 | 384-3rd Fl. | Transportation \& Logistics I |  | Transportation \& Logistics II | Transportation \& Logistics III |  | Transportation \& Logistics IV |
| 19 | 383-3rd Fl. | Logistics/Vehicle Routing |  | Kimberly-Clark Opt. Contest | Logistics/Vehicle Routing |  | Logistics/Vehicle Routing |
| 20 | 382-3rd Fl. | 7th ESICUP |  | 7th ESICUP | 7th ESICUP |  | No Session |

TUESDAY

| Track | Room | $\begin{gathered} \text { TA } \\ 8: 30-10: 00 \end{gathered}$ | $\begin{gathered} \text { Plenary } \\ \text { 10:30-11:20 } \end{gathered}$ | $\begin{gathered} \text { TB } \\ \text { 11:30-1:00 } \end{gathered}$ | $\begin{gathered} \text { TC } \\ 1: 20-2: 50 \end{gathered}$ | Keynotes 3:00-3:50 | $\underset{4: 20-5: 50}{\text { TD }}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Aula Magna - 1st Fl. | Tutorial |  | Tutorial | Tutorial |  | Tutorial |
| 2 | Salón Rojo-1st FI. | OR for Developing Countries |  | OR for Developing Countries | OR for Developing Countries |  | OR for Developing Countries |
| 3 | Auditorio - 1st Fl. | Teaching Effectiveness Colloq. |  | Teaching Effectiveness Colloq. | Teaching Effectiveness Colloq. |  | Teaching Effectiveness Colloq. |
| 4 | Salón Azul-1st FI. | Opt.-Practice \& Software | Plenary | Opt.-Practice \& Software | Opt.-Practice \& Software | Keynote | Opt.-Practice \& Software |
| 5 | Velez Sarfield - 2nd FI. | Multi-Criteria Analysis \& Optimization | David Simchi-Levi Creating Value in a | Multi-Criteria Analysis \& Optimization | Multi-Criteria Analysis \& Optimization | Paul Glasserman Valuing the | Multi-Criteria Analysis <br> \& Optimization |
| 6 | 352-3rd FI. | Forecasting I | Volatile World | Forecasting II | Business Applications | Treasury's | Business Apps: E-Business |
| 7 | 353-3rd Fl. | Scheduling I | Salón de Actos | Scheduling II | Scheduling III | Capital Assistance | Scheduling IV |
| 8 | 355-3rd Fl. | Data Envelopment Analysis I |  | Data Envelopment Analysis II | Data Envelopment Analysis III | Proqram | Data Envelopment Analysis IV |
| 9 | 356-3rd Fl. | INFORMS Sim. \& Computing Societies |  | INFORMS Simulation | INFORMS Simulation | Aula Magna | INFORMS Simulation |
| 10 | 357-3rd Fl. | Graphs Theory, Algor.\& Apps. |  | Graphs Theory, Algor.\& Apps. | Graphs Theory, Algor. \& Apps. |  | Graphs Theory, Algor. \& Apps. |
| 11 | 362-3rd Fl. | Mathematical Programming |  | Nonlinear Opt. | Nonlinear Opt.I |  | Nonlinear Opt. II |
| 12 | 363 - 3rd Fl. | Supply Chain Mgt. |  | Supply Chain Mgt. | Supply Chain Mgt. | Keynote | Supply Chain Mgt. |
| 13 | $364-3 \mathrm{rdFl}$. | Energy, Nat. Res., Env. |  | ENRE | ENRE | Ralph Keeney | Forestry Mgt. |
| 14 | 365-3rd Fl. | Game Theory \& Applications |  | Game Theory \& Applications | Game Theory \& Applications | Practical Models for | Game Theory |
| 15 | 351-3rd Fl. | Data Mining |  | Data Mining | Data Mining | Group Decisions | Data Mining |
| 16 | 385-3rd Fl. | Metaheuristics |  | Metaheuristics | Metaheuristics | Auditorio | Metaheuristics |
| 17 | 387-3rd Fl. | Metaheuristics I |  | Metaheuristics II | Metaheuristics III |  | Metaheuristics IV |
| 18 | 384-3rd Fl. | Transportation \& Logistics V |  | Logistics I | Logistics II |  | Network Design |
| 19 | $383-3 \mathrm{rdFl}$. | Logistics/Location |  | Launching RIIO | Logistics/Vehicle Routing |  | Logistics/Vehicle Routing |
| 20 | 382-3rd Fl. | Telecommunications |  | Eval. \& Design of Telecomm Networks | Eval. \& Design of Telecomm Networks |  | Eval. \& Design of Telecomm Networks |

## WEDNESDAY

| Track | Room | $\begin{gathered} \text { WA } \\ 8: 30-10: 00 \end{gathered}$ | $\begin{gathered} \text { Plenary } \\ \text { 10:30-11:20 } \end{gathered}$ | $\begin{gathered} \text { WB } \\ \text { 11:30-1:00 } \end{gathered}$ | $\begin{gathered} \text { WC } \\ \text { 1:20-2:50 } \end{gathered}$ | Keynotes <br> 3:00-3:50 | $\begin{aligned} & \text { WD } \\ & \text { 4:20-5:50 } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Aula Magna - 1st Fl. | Tutorial |  | Tutorial | Tutorial |  | No Session |
| 2 | Salón Rojo-1st Fl. | Complex Social Problems |  | Special Invited: Reverse Logistics in Latin America | Logistics/Location |  | ALIO Constituency Informative Meeting |
| 3 | Auditorio - 1st Fl. | Healthcare/HAS |  | Healthcare/HAS | Healthcare/HAS |  | Healthcare/HAS |
| 4 | Salón Azul-1st FI. | Opt.-Practice \& Software | IFORS Distinguished | Opt.-Practice \& Software | Opt.-Practice \& Software | Keynote | No Session |
| 5 | Velez Sarfield - 2nd FI. | Multi-Criteria Analysis \& Opt. | Lecture | Multi-Criteria Analysis \& Opt. | Multi-Criteria Analysis \& Opt. | Egon Balas | Multi-Criteria Analysis \& Opt. |
| 6 | 352-3rd FI. | Marketing | Garrett Van Ryzin | Operations/Marketing Interface | Service Industry | Sharper Cuts for | OR Computing |
| 7 | 353-3rd Fl. | Project Mgt. \& Scheduling | Choice-Based | Production \& Scheduling | Operations Mgt. | Mixed-Integer | OR in Sports |
| 8 | 355-3rd FI. | Dynamic Programming \& Apps | Revenue Mgt. | Dynamic Programming \& Apps | Dynamic Programming \& Apps | Programs | Dynamic Programming/ Control |
| 9 | 356-3rd Fl. | INFORMS Simulation | Salón de Actos | INFORMS Simulation | Simulation II | Aula Magna | Simulation III |
| 10 | 357-3rd Fl. | Graphs Theory, Algorithms \& Apps. |  | Graphs \& Networks I | Graphs \& Networks II |  | Graphs \& Networks III |
| 11 | 362-3rd Fl. | Optimization |  | Interior-Point Methods | Special Invited: Convex \& Nonconvex MI Nonlinear |  | No Session |
| 12 | 363-3rd Fl. | Supply Chain Mgt. |  | Supply Chain Mgt. | Supply Chain Mgt. | Keynote | No Session |
| 13 | 364-3rd Fl. | Energy Policy \& Planning I |  | Energy Policy \& Planning II | Energy Policy \& Planning III | Christopher Tang | Environmental Mgt. |
| 14 | $365-3 \mathrm{rd} \mathrm{Fl}$. | Knowledge in Organizations |  | Knowledge in Organizations | Quality Control \& Mgt. | Mkting-Operations | Mgt. of Technology |
| 15 | 351-3rd Fl. | Data Mining |  | Data Mining | Fuzzy Sets \& Systems | Interface Models | No Session |
| 16 | $385-3 \mathrm{rdFl}$. | Metaheuristics |  | Metaheuristics | Metaheuristics | Auditorio | Metaheuristics |
| 17 | $387-3 \mathrm{rd} \mathrm{Fl}$. | Metaheuristics V |  | Metaheuristics VI | Metaheuristics VII |  | Special Invited: Parallel Optimization |
| 18 | $384-3 \mathrm{rd} \mathrm{FI}$. | Assignment Problems |  | Facility Location I | Facility Location II |  | Novel Approaches to Education |
| 19 | $383-3 \mathrm{rd} \mathrm{FI}$. | Logistics/Vehicle Routing |  | Logistics/Vehicle Routing | Logistics/Vehicle Routing |  | No Session |
| 20 | 382 - 3rd Fl. | Eval. \& Design of Telecomm Networks |  | Eval. \& Design of Telecomm Networks | Eval. \& Design of Telecomm Networks |  | Eval. \& Design of Telecomm Networks |

## FIRST FLOOR

TRACKS
Track numbers shown for Technical Session Rooms

* Session Monitor Desk



## SECOND FLOOR

## Track 5

Sálon Velez Sarfield, 2nd Floor
Take E4 stairs and follow signs

## MULTIPLE WAYS TO 3RD FLOOR

## E7 Stairs

E5 Elevator
E4 Stairs
E4 Elevator to 2nd Floor and then
stairs to 3rd Floor

## THIRD FLOOR

Track numbers shown for Technical Session Rooms
TRACKS

Session Monitor Desk


## 7TH ESICUP MEETING

## EURO SPECIAL INTEREST GROUP ON CUTTING AND PACKING

The 7th ESICUP Meeting is the 2010 regular meeting of the EURO Special Interest Group on Cutting and Packing. This conference provides a forum for those working in the cutting and packing field, bringing together researchers from all over the world. The 2010 meeting takes place as a meeting-within-ameeting during the ALIO-INFORMS Joint International Meeting in Buenos Aires.

## Program Chair

José Fernando Oliveira
University of Porto, Portugal

## Program Committee

Julia Bennell
University of Southampton, UK
António Miguel Gomes
University of Porto, Portugal
Gerhard Wäscher
Otto-von-Guericke Universität Magdeburg, Germany
Horacio Yanasse
National Institute for Space Research, Brazil
Sponsored by

EURO
The Association of European Operational Research Societies

## ALIO infoniss

## 7TH ESICUP TECHNICAL SESSIONS

Technical sessions are open to all attendees registered for the ALIO-INFORMS meeting. All sessions take place in Room 382,Floor 3.

## Sunday, June 6

2:30pm-4:00pm (SC20)
Cutting and Packing 1
4:30pm-6:00pm (SD20)
Cutting and Packing 2

## Monday, June 7

8:30am-10:00am (MA20)
Cutting and Packing 3
11:30am-1:00pm (MB20)
Cutting and Packing 4
1:20pm-2:50pm (MC20)
Cutting and Packing 5

## TEACHING EFFECTIVENESS COLLOQUIUM

The 3rd Joint ALIO/INFORMS/IFORS Teaching Effectiveness Colloquium brings together respected innovators in ORMS education from around the world to present their creative, novel and effective responses to various issues in ORMS education. Each session will feature a workshop on a single topic of interest to instructors of ORMS and will feature active participation by the audience.

## Program Co-Chairs

James J. Cochran
Louisiana Tech University, USA
Marcela González Araya
Universidad de Talca, Chile

Sessions are open to all attendees registered for the ALIO-INFORMS meeting. All sessions take place in the Auditorio, 1st floor.

## Monday, June 7

8:30am-10:00am (MA03)
TECI
Why and How to Teach Modeling
11:30am-1:00m (MB03)
TEC II
Using Interactive Case Studies to Teach Operations Research
1:20pm-2:50pm (MCO3)
TEC III
Introducing Real Problem Solving into an OR Course

4:20pm-5:50pm (MD03)
TEC IV
Using Classroom Games to Support the Learning Process

## Tuesday, June 8

8:30am-10:00am (TA03)
TECV
Postgraduate Education on OR:Towards a Multidisciplinary
Approach for Applications
11:30am-1:00m (TB03)
TEC VI
Discrete Mathematics in the Classroom

1:20pm-2:50pm (TCO3)
TEC VII
Experiences in Cooperative Learning using Real-World Based
Problems in OR Courses

4:20pm-5:50pm (TD03)
TEC VIII
Project Courses: Adopting Best Practices from the Consulting Profession


## WELCOME RECEPTION

Law School, University of Buenos Aires Sunday, June 6, 6:00pm-8:00pm Hall de los Pasos Perdidos

Wear your badge for admission to this reception.
ALIO and INFORMS welcome you to the 2010 International Meeting with an evening of fellowship and friendship. The reception will be held in the majestic Hall de los Pasos Perdidos at the University of Buenos Aires Law School. It is the perfect venue to meet with colleagues at the beginning of the meeting to plan your conference week and your stay in Buenos Aires. Registration will also be open during the reception, so you can pick up your registration materials at the same time. Enjoy some great food, wine and soft drinks.

## TOUR DESK

A tour desk operated by TIP International will be open at the following hours:

| Sunday | 4:00pm-8:00pm |
| :---: | :---: |
| Monday | 10:00am-11:00am 3:30pm-6:00pm |
| Tuesday | 10:00am-11:00am 3:30pm-6:00pm |
| Wednesday | 10:00am-11:00am <br> 3:30pm-6:00pm |

TIP representatives will be able to assist with:

- ticket confirmation (for tickets purchased through TIP)
- general tourist information
- local and regional tours
- hotel-airport transfer services (not including local taxis)
- advice on restaurants and shows
- brochures, maps, printed tour guides


## SEÑOR TANGO DINNER SHOW

Tuesday, June 8, 8:00pm-11:30pm
If you purchased a ticket(s) in advance for this show, a voucher(s) for entrance as well as information on bus transportation to and from the theatre were included in your registration packet. If you have not purchased a ticket and would like to do so, stop by the TIP tourism booth during the meeting tickets may still be available for the June 8 show or other nights. If you have questions about the show or arrangements, please go to the TIP booth or the registration desk.


A spectacular Tango show in Buenos Aires! The show was created, directed and produced by Fernando Soler, a famous singer. There are more than 40 artists on stage, accompanied by a traditional tango orchestra under the direction of Maestro Ernesto Franco. All the latest technology is used during this dazzling show of dance, music and singing. Señor Tango is located in the old district of Barracas. The traditional architecture of the three-level building shows vaulted ceilings, iron columns and paving stone floors in colored quebracho. Highlights of the show include "Hideaway," a tango version of the "Apache" style of European ballroom dancing with a flamenco inspiration, and "Roxanne," the first choreography that establishes a relationship between Tango and Hollywood.


## EXHIBITORS

AMPL Optimization LLC
900 Sierra PI.SE
Albuquerque, NM 87108-3379
www.ampl.com
AMPL Optimization LLC develops and supports the AMPL modeling language, the most powerful and natural tool for working with the large, complex linear and nonlinear optimization problems that arise in diverse applications. The AMPL language is notable for its convenient support of extended problem formulations and advanced algorithmic features. AMPL Optimization distributes AMPL and large-scale solvers including CONOPT, Gurobi, KNITRO, MINOS and SNOPT. AMPL is also distributed by solver developers Gurobi, IBM, Mosek and Ziena to complement their products. Over 30 other solvers work with AMPL, as do OptiRisk Systems' AMPL Studio and COM objects, and TOMLAB's MATLAB interface.

## FICO

901 Marquette Ave.,Ste. 3200
Minneapolis, MN 55402
http://www.fico.com/en/Products/DMTools/Pages/
FICO-Xpress-Optimization-Suite.aspx
FICO combines optimization with world-class predictive analytics and decision management tools to help businesses make connected, optimal and forward-looking decisions. We offer the FICO Xpress Optimization Suite - developed by Dash Optimization, and acquired by FICO two years ago. With its unique Mosel modeling language, FICO Xpress leverages $25+$ years of experience in optimization to give you unprecedented flexibility and power. Come see why many OR leaders -including Edelman Winner American Airlines, which recently chose Xpress over all competitors for an Enterprise License - are calling the FICO Xpress Optimization Suite the new leader in optimization.

## IBM

926 Incline Way, \#100
Incline Village, NV 89451
http://www-01.ibm.com/software/websphere/ products/optimization/

IBM is a leader in the field of operations research, and specifically in the discipline of optimization. We offer some of the world's most advanced optimization technologies for solving tough business and research problems - longer than anyone. Our awardwinning tools and engines speak for our high standards and belief in innovation. And we're always thinking of something new. See for yourself why more than 1,000 universities use IBM ILOG Optimization for research and teaching, and more than 1,000 commercial customers, including over 160 of the Global 500, use IBM ILOG Optimization in some of their most important planning and scheduling applications.

## SOFTWARE TUTORIALS

## FICO - Building Optimization Applications in FICO Xpress

Oliver Bastert
Product Management
Sunday, SC19, 2:30pm-3:15pm
Room 383, 3rd Fl.
This tutorial will focus on developing and deploying complete optimization applications using FICO's array of mathematical modeling and optimization tools. These tools can be used for modeling, solving, analyzing and visualizing optimization problems, and integrating them seamlessly in business applications. During this tutorial, Bastert will explain how Xpress-Mosel, Xpress-IVE and XpressApplication Developer can decrease development time for new optimization applications and enable you and your customers to make smarter decisions. The proven technologies offered by FICO can be used in range of applications such as supply chain management, transportation, finance, energy, manufacturing, retail, insurance and manufacturing industries, to name a few.

## IBM ILOG CPLEX

Optimization Studio 12.2
Joshua Woodruff, Technical Account Manager
Sunday, SD03, 4:30-5:15pm
Room 361,3rd FI.
IBM ILOG CPLEX Optimization Studio supports the rapid development and deployment of both mathematical programming and constraint programming models, from a powerful integrated development environment using the Optimization Programming Language (OPL), through programmatic APIs or using 3rd party modeling interfaces. In this tutorial we will explore the comprehensive capabilities now offered in a single product offering, spanning the development, tuning, analysis and deployment of optimization models. We will review IBM's machine/platform-independent keyless licensing policies, and highlight key features of the latest release, including performance improvements in the IBM ILOG CPLEX Optimizers and Gantt charts for reviewing and debugging scheduling models in the CPLEX Studio IDE.

## AMPL-Attacking Hard Mixed-Integer Optimization Problems Through the AMPL Modeling Language

Robert Fourer, Principal
Tuesday, TB04, 11:30am
Salón Azul, 1st FI.
There are many tricks for formulating complex optimization models by use of integer variables, but what's to be done when even the most advanced solvers can't produce results in reasonable time? A series of examples show how substantial improvements in performance can be achieved through carefully focused troubleshooting and experimentation facilitated by the power and flexibility of the AMPL modeling language and its solver interfaces.

| 7th ESICUP Meeting: Cutting \& | Healthcare Operations | Nonlinear Optimization |
| :---: | :---: | :---: |
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| Aviation Theory \& Applications Nicole Adler | Beste Kucukyazici MIT-Zaragoza International Logistics Program, Spain | Universidade de Sao Paulo, Brazil egbirgin@ime.usp.br |
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| Evaluation \& Design of Telecommunication Networks | kucukyavuz.2@osu.edu | O.R. for Development \& Developing Countries |
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|  | Multicriteria Analysis \& Optimization João Climaco FEUC \& INESC Coimbra, Portugal jclimaco@fe.uc.pt |  |
|  | Marta Pascoal <br> FCTUC \& INESC Coimbra, Portugal marta@mat.uc.pt |  |

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