

CONFERENCE HANDBOOK

#euro2018valencia



EURO2018

29th European Conference
on Operational Research
VALENCIA, JULY 8-11, 2018





EURO2018

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on Operational Research
VALENCIA, JULY 8-11, 2018

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Prof. Richard Eglese
Lancaster University
Management School
president@euro-online.org

1.1. PRESIDENT OF EURO

It is a great pleasure to welcome you all to the 29th European Conference on Operational Research.

As an organisation, EURO supports many activities concerning the promotion of our discipline. For example, there are many working groups that specialise in particular aspects of OR and a range of publications, including academic journals and books. But the main EURO conference is a great opportunity for OR academics and practitioners to get together, to keep up with developments in their own special fields of interest and to learn about new techniques and applications in other areas of OR.

A large conference like this does not just happen. A lot of hard work has been undertaken by a great many people in order to prepare for the event. In particular, the Programme Committee, chaired by Greet Vanden Berghe, has done a magnificent job in preparing a rich programme of presentations covering a wide range of theory and applications. You will have a significant decision problem in deciding which ones to attend. Stream leaders, session chairs and individual authors have all contributed to providing this impressive programme. Also, the Organising Committee, led by Ramón Álvarez-Valdés and Rubén Ruiz, has been very busy ensuring that the practical arrangements are in place for us to be able to have an effective meeting. I would like to thank everybody who has contributed to EURO XXIX.

Valencia is a beautiful city and a great location for our conference. A few years ago, I was lucky enough to be invited to visit and was very impressed by the ambience of the city, with its attractive park, striking architecture, tasty paellas and inviting beaches. I am looking forward to returning and I hope that your visit to Valencia for EURO XXIX is equally memorable and that you will be able to meet old friends and make new ones.

I hope you have a productive conference and you enjoy your visit to Valencia.

Richard Eglese
President of EURO



Emilio Carrizosa Priego

Departamento de Estadística e Investigación Operativa
Universidad de Sevilla
Facultad de Matemáticas
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1.2. PRESIDENT OF SEIO

Esteemed colleagues, dear friends,

SEIO, the Spanish Statistics & Operational Research Society, was founded in 1962 and has more than 600 members all over Spain. On behalf of the Society, let me warmly welcome you to our country and to EURO 2018, the 29th European Conference on Operational Research. I would like to offer a special welcome to participants from countries in conflict; your effort in being here is sincerely appreciated.

The Program and Organization Committees have done a great job in offering us all a scientific event of the highest significance, full of illuminating plenaries, keynotes and streams reflecting the dynamic state of our field and our profession. EURO 2018 will also be an excellent forum for open discussions about important issues such as the role of women as scientific researchers (Women in Science Event) or the practice of OR and Analytics (Making an Impact).

The schedule certainly promises to be exhausting. However, as OR experts we are used to maximizing rewards under physical and technical constraints. So you will have no difficulty in finding time to enjoy the beauties of Valencia, with its impressive cultural heritage (not forgetting its gastronomy!) and its lifestyle and beaches. Hopefully you will also take a moment to read TOP, our OR journal, and consider submitting your valuable work.

Whether or not this is your first visit to Spain, I am sure it will not be your last, and that neither the conference nor the country will disappoint your expectations. Enjoy!

Emilio Carrizosa,
President of SEIO



Greet Vanden Berghe

KU Leuven

Greet.VandenBerghe@cs.kuleuven.be

1.3 CHAIR OF THE EURO 2018 PROGRAMME COMMITTEE

Dear EURO2018 conference participants,

Operational Research was born in the shadow of some of Europe's darkest hours: World War II. Back then, the discipline primarily served to support and bolster military efforts. It was an entirely understandable and deeply necessary role to play. Today, almost 80 years later, a casual glance through the titles of EURO2018's many abstracts paints a very different picture. While the same fundamental principles very often remain in place, they are no longer being deployed to defeat enemies, but to cultivate harmony. Operational Research has steadily matured in a positive direction, one increasingly characterised by humanitarianism, improved living and working conditions, sustainability, safety and fairness. Moreover, for each step our field takes in this new direction, many more opportunities and possibilities come into view.

Occasions such as EURO2018 serve to not only bring together a variety of talented individuals working in a range of different areas to share their findings and progress, but also to showcase this massive scope for future innovation and collaboration. Ever-increasing computing power, artificial intelligence and an abundance of data means that Operational Research has the potential to solve more problems and explore more theoretical possibilities than ever before. And where better to bring together these individuals and discuss these new possibilities than the beautiful city of Valencia, whose marvellous universities play host to this year's conference.

Valencia not only represents a hidden Mediterranean secret for many of us, but is also home to an exceptionally dedicated and professional organization team. Special thanks goes to all those at the Universitat de València and Universitat Politècnica de València. It has been a particularly great pleasure to work with both conference chairs - Ramón Álvarez-Valdés and Rubén Ruiz - who are among the most reliable and efficient people I have ever known.

EURO2018 promises to be a diverse and exciting event. Indeed, we received over 2600 abstracts, with almost 40 percent of those authors living and working beyond Europe's borders. Regardless of whether attendees are from near or far, the organizing committee is incredibly grateful to all for their support and participation in this year's conference. The efforts and enthusiasm exhibited by our stream organizers and session chairs will surely result in a rich scientific event which offers plenty of complementary streams, presentations and activities to please all those attending. This year's program will also feature three scientifically renowned plenary speakers, the IFORS distinguished lecturer in addition to 11 eminent keynote speakers who will present the state-of-the-art in complementary OR disciplines. Further, not only have many excellent initiatives introduced during previous conference editions been adopted, but I am proud to introduce a new one: several special issues by academic journals which will publish work presented at this conference.

I want to end by wishing all delegates days full of inspiration. I hope everybody will make the most of the many opportunities for deepening their OR knowledge. That you will explore the many OR practice activities, sample unfamiliar research areas, have productive discussions with exhibitors, initiate fruitful research cooperation and above all celebrate being part of what is an exciting and rewarding academic community.

Greet Vanden Bergh
Program Committee Chair EURO 2018



Ramón Álvarez-Valdés
Co-chair
Universitat de València, Spain
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Rubén Ruiz
Co-chair
Universitat Politècnica de València
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1.4 CO-CHAIRS OF THE EURO 2018 ORGANIZATION COMMITTEE

We are very pleased and proud to welcome you to Valencia, host of the 29th EURO conference. Our city, the third largest in Spain, has an attractive blend of history and modernity. Its medieval centre, beautifully restored, is complemented by the spectacular architecture of the City of Arts and Sciences, where some of the conference events will take place.

We have been attending EURO conferences for many years and at every one of them we have enjoyed interesting discussions, met new colleagues who have become friends and collaborators, and witnessed new developments in our field. When we were appointed to organize this conference, we accepted the challenge of providing this atmosphere capable of facilitating networking, debate, and presentation of new applications and advances in OR.

While Greet Vanden Berghes and the Programme Committee were developing an interesting academic programme, our task, as leaders of a team with members from the Universitat de València and the Universitat Politècnica de València, has been to prepare the infrastructure, logistics, and social programme. Every social event and celebration in Valencia has two essential elements: music and gunpowder. We have included both in our programme, as a way of giving you an idea of the character of our region, and mainly because we are convinced that they will help us to create the desired atmosphere for interacting with old and new friends and make your visit to Valencia a memorable and fruitful experience.

Welcome to Valencia!



ORGANIZATION

2.1 PROGRAMME COMMITTEE

Greet Vanden Berghe,

KU Leuven, Belgium
Chair of the EURO 2018 Programme
Committee

Ramón Álvarez-Valdés,

Universitat de València, Spain
Co-Chair of the EURO 2018
Organization Committee

Luce Brotcorne,

INRIA (Lille), France

Rita Laura d'Ecclesia,

Università La Sapienza di Roma, Italy

Carlos Fonseca,

Universidade de Coimbra, Portugal

Sarah Fores,

EURO

Bernard Fortz,

Université Libre de Bruxelles, Belgium

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University of Debrecen, Hungary

Luis Gouveia,

Universidade de Lisboa, Portugal

Geir Hasle,

SINTEF, Oslo, Norway

Bernard Ries,

Université de Fribourg, Switzerland

Rubén Ruiz,

Universitat Politècnica de València, Spain
Co-Chair of the EURO 2018
Organization Committee

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Koç University, Istanbul, Turkey

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Universität Mannheim, Germany

Michal Tzur,

Tel Aviv University, Israel

Cristos Vasilakis,

University of Bath, UK

Daniele Vigo,

Università di Bologna, Italy

Albert Wagelmans,

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EURO Vice-President I

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Aalto University, Finland

Gerhard-Wilhelm Weber,

Poznan University of Technology,
Poland

Stefan Wrzaczek,

Austrian Academy of Sciences (Vienna),
Austria

2.2 ORGANIZATION COMMITTEE

Ramón Álvarez-Valdés

Co-Chair of the EURO 2018 Organization Committee. Universitat de València, Spain

Rubén Ruiz

Co-Chair of the EURO 2018 Organization Committee. Universitat Politècnica de València, Spain

Greet Vanden Berghe

Chair of the EURO 2018 Program Committee. KU Leuven, Belgium

Albert Wagelmans

EURO Vice-President I Erasmus. University, Netherlands

Carlos Andrés, Universitat Politècnica de València, Spain

José Manuel Belenguero, Universitat de València, Spain

Fanny Collado, Universitat Politècnica de València, Spain

Luke Connolly, KU Leuven, Belgium

Angel Corberán, Universitat de València, Spain

Juan Carlos Cortés, Universitat Politècnica de València, Spain

Bárbara Díaz, Fundación Universidad Empresa de Valencia, Spain

Rafael Fernández, Universitat de València, Spain

Sarah Fores, EURO

Bernard Fortz, Université Libre de Bruxelles, Belgium

José Pedro García, Universitat Politècnica de València, Spain

Carolina Gil, Fundación Universidad Empresa de Valencia, Spain

Vicent Giner, Universitat Politècnica de València, Spain

Ruth Kaufman, Immediate Past President, The OR Society

Maite León, Universitat de València, Spain

Vicente Liern, Universitat de València, Spain

Antonio Lova, Universitat Politècnica de València, Spain

Julien Maheut, Universitat Politècnica de València, Spain

Rafael Martí, Universitat de València, Spain

Gerardo Minella, Universitat Politècnica de València, Spain

Cristobal Miralles, Universitat Politècnica de València, Spain

Consuelo Parreño, Universitat de València, Spain

Federico Perea, Universitat Politècnica de València, Spain

Marisa Quintanilla, Universitat de València, Spain

Ana Isabel Sánchez, Universitat Politècnica de València, Spain

Ester Srougi, Universitat Politècnica de València, Spain

Pieter Smet, KU Leuven, Belgium

Thomas Stidsen, Technical University of Denmark

Pilar Tormos, Universitat Politècnica de València, Spain

Eva Vallada, Universitat Politècnica de València, Spain

Enriqueta Vercher, Universitat de València, Spain

Ful Villa, Universitat Politècnica de València, Spain

2.3 ORGANIZATIONAL SUPPORT



PROGRAMME

3.1 PROGRAMME OVERVIEW

EURO 2018 SCHEDULE

Sunday July 8	Monday to Wednesday	Monday July 9	Tuesday July 10	Wednesday July 11
	Morning A	MA 08:30-10:00 Parallel Sessions	TA 08:30-10:00 Parallel Sessions	WA 08:30-10:00 Parallel Sessions
	Coffee break	10:00 - 10:30	10:00 - 10:30	10:00 - 10:30
	Morning B	MB 10:30-12:00 Parallel Sessions	TB 10:30-12:00 Parallel Sessions	WB 10:30-12:00 Parallel Sessions
		12:00 - 12:30	12:00 - 12:30	12:00 - 12:30
	Lunch 12:00-14:30	Midday C	MC 12:30-14:00 Parallel Sessions	TC 12:30-14:00 Parallel Sessions
		14:00 - 14:30	14:00 - 14:30	14:00 - 14:30
14:00 - 20:00 Registration open	Afternoon D	MD 14:30-16:00 Parallel Sessions	TD 14:30-16:00 Parallel Sessions	WD 14:30-16:00 Parallel Sessions
	Coffee break	16:00 - 16:30		16:00 - 16:30
	Afternoon E	ME 16:30-17:30 Plenary		16:30 - 17:30 Bus transfer to CAC
17:30 - 19:00 Opening session		17:45 - 19:00 Women in Science event	TE 18:00-19:00 Plenary	WE 17:30-18:30 Plenary
Welcome party			20:00 Gala dinner	18:45 - 20:00 Closing session
				Closing party

PLENARY AND KEYNOTE LECTURES

		Monday July 9	Tuesday July 10	Wednesday July 11
Morning A		MA 08:30-10:00 Tamás Terlaky	TA 08:30 -10:00 Santo Fortunato	WA 08:30 -10:00 IFORS Tutorial Lecture Andrés Medaglia
Coffee break		10:00 - 10:30	10:00 - 10:30	10:00 - 10:30
Morning B		MB 10:30-12:00 Elaine Chew	TB 10:30-12:00 Iris Vis	WB 10:30-12:00 M. Antónia Carravilla
Lunch 12:00-14:30		12:00 - 12:30	12:00 - 12:30	12:00 - 12:30
Midday C		MC 12:30-14:00 David Matchar	TC 12:30-14:00 Dolores Romero	WC 12:30-14:00 Patrick Jaillet
Afternoon D		14:00 - 14:30	14:00 - 14:30	14:00 - 14:30
Afternoon E		MD 14:30-16:00 Pinar Keskinocak	TD 14:30-16:00 Anita Schoebel	WD 14:30-16:00 Carol Alexander
Coffee break		16:00 - 16:30		16:00 - 16:30
		ME 16:30-17:30 Roger Z. Rios		16:30 - 17:30 Bus transfer to CAC
		17:45 - 19:00 Women in Science event	TE 18:00-19:00 IFORS Distinguished Lecturer Cynthia Barnhart	WE 17:30-18:30 Gerhard Woeginger
			20:00 Gala dinner	18:45 - 20:00 Closing session
				Closing party

3.2 INVITED PLENARY SPEAKERS



Cynthia Barnhart

MIT's Chancellor and Ford Foundation Professor of Engineering

IFORS Distinguished Lecturer

Place: Opera house at City of Arts and Sciences

Date: Tuesday, July 10 / 18:00-19:00

Air Transportation Optimization

There is a long history of applying operations research techniques to problems in airline and air transportation system planning and operations. Over time, these techniques have become more sophisticated, with models and algorithms enhanced to account for multiple sources of uncertainty, competitive effects, passenger choice, and dynamic decision making, to name a few. The impacts have been significant, as demonstrated through numerous applications to air transportation problems across the globe. In this talk, I will briefly review this history, provide examples that illustrate the evolution of modeling and solution approaches, quantify some of the impacts, and highlight research opportunities in the field.



Roger Z. Rios

Universidad Autónoma de Nuevo León, Mexico

EURO Plenary Lecture

Place: UPV Nexus

Date: Monday, July 9 / 16:30-17:30

The Discrete Charm of Districting

Districting or territory design problems involve essentially partitioning decisions. Given a set of basic geographical areas, the idea is to find a partition of these into clusters or districts in such a way that specific planning requirements are met. These requirements depend naturally on the specific application. Districting problems are motivated by very different applications, such as political districting, sales and service territory design, school districting, the design of territories for waste collection, to name a few. Through the years many ideas for tackling these very difficult discrete optimization problems have been successfully developed.

In this talk, we will go through some of the most representative models and features, highlighting particular properties and successful ideas for efficient algorithmic development. Special emphasis will be given to the computational issues and how particular problem structures and properties can be adequately exploited for efficient algorithmic design. The last part of the talk will include a discussion of current research trends on this fascinating class of discrete optimization problems.



Gerhard Woeginger

Professor at RWTH Aachen University

EURO Plenary Lecture

Place: Opera house at City of Arts and Sciences

Date: Wednesday, July 11 / 17:30-18:30

Theory can sometimes be useful

We sometimes get stuck while trying to model computational problems in a certain framework, or while trying to design fast algorithmic solutions for certain subproblems. The talk discusses some concrete situations, and convincingly explains (with the help of computational complexity theory) the various reasons for our failures.

3.3 INVITED KEYNOTE SPEAKERS



Carol Alexander

Professor of Finance at the University of Sussex

Place: UPV Nexus

Date: Wednesday, July 11 14:30-16:00

The General Aggregation Property and its Application to Regime-Dependent Determinants of Variance, Skew and Jump Risk Premia

A general theory is developed which encompasses two different aggregation properties of Neuberger (2102) and Bondarenko (2014). Theoretical results establish a wide variety of new, unbiased and efficient risk premia estimators. The higher-moment risk premia part of the theory allows one to analyse regime-dependent behaviour in variance, skew and jump risk premia for the first time. Empirical results on meticulously-constructed daily, investable, constant-maturity S&P500 higher-moment premia reveal significant new results. The variance premium is fully priced by Fama and French (2015) factors during the volatile regime, and only has significant negative alpha in stable-trending markets. A small, positive but significant third-moment premium is not fully priced by the variance and equity premia, but again this is only during stable-trending markets. There is no evidence for a separate fourth-moment premium in any regime, this is fully determined by the equity and variance risk premia.



Maria Antónia Carravilla
University of Porto

Place: UPV Nexus

Date: Wednesday, July 11 10:30-12:00

Teaching experiments are condemned to be successful

The stream on Teaching OR/MS is part of the EURO and IFORS conferences since 2010 in Lisbon. The contributions of our community for this stream show that skilled teachers with their enthusiasm and experience are able to create teaching experiments that, as we once heard, are condemned to be successful.

In this talk, we will go through several examples of teaching and learning practices in OR, selected from the ones presented in the Teaching OR/MS stream, from the literature, and from direct contributions. These reported practices may be based on case studies, specific software packages, classroom games and also projects which engage students and help to develop the competencies that are needed to apply the OR/MS methods in practice. There are also some experiments on assessment for large groups of students and on gamification. We believe that experiments like these ones, adapted to the specific program, and to the number and concrete characteristics of the students, may form the building blocks for rather successful OR/MS courses.



Santo Fortunato

Director of the CNetS and a Scientific Director at Indiana University

Place: UPV Nexus

Date: Tuesday, July 10 8:30-10:00

Community structure in complex networks

Complex systems typically display a modular structure, as modules are easier to assemble than the individual units of the system, and more resilient to failures. In the network representation of complex systems, modules, or communities, appear as subgraphs whose nodes have an appreciably larger probability to get connected to each other than to other nodes of the network. In this talk I will address three fundamental questions: How is community structure generated? How to detect it? How to test the performance of community detection algorithms? I will show that communities emerge naturally in growing network models favoring triadic closure, a mechanism necessary to implement for the generation of large classes of systems, like e.g. social networks. I will discuss the limits of the most popular class of clustering algorithms, those based on the optimization of a global quality function, like modularity maximization. Testing algorithms is probably the single most important issue of network community detection, as it implicitly involves the concept of community, which is still controversial. I will discuss the importance of using realistic benchmark graphs with built-in community structure.



Elaine Chew

Professor at Queen Mary University of London

Place: UPV Nexus

Date: Monday, July 9 10:30-12:00

Optimization and Music Data Science

The explosion in digital music information has spurred the developing of mathematical models and computational algorithms for accurate, efficient, and scalable processing of music information. According to the 2017 IFPI Industry Global Music Report, the total global recorded music revenue was US\$15.7b in 2016, 50% of which were digital. Industrial scale applications linking recorded content to listeners include Last.fm, Pandora, Shazam, and Spotify. Shazam has over 120 million active users monthly and Spotify over 140 million. Since the launch of Shazam, users have issued 30 billion song identification requests, growing by 20 million each day. With such widespread access to large digital music collections, there is substantial interest in scalable models for music processing. Optimization concepts and methods thus play an important role in machine models of music engagement, music experience, music analysis, and music generation.

In this talk, we will show how optimization ideas and techniques have been integrated into computer models of music representation and expressivity, and into computational solutions to music generation and structure analysis. More specifically, we will report on research and outcomes on an interior-point approach to modeling tonal perception (inferring the keys and chords from note information), the idea of duality in reverse-engineering music structure analyses, constraint-based music generation to instill long-term structure, an optimization heuristic for stream segregation separating out voices from a polyphonic texture), statistical and optimization-based approaches to music segmentation, and rhythm transcription that minimizes quantization error for music and arrhythmia sequences. The talk will contain numerous music illustrations and, where appropriate, live performances of music and demonstrations of interactive visualization software on a piano or keyboard.



Patrik Jaillet

MIT

Place: UPV Nexus

Date: Wednesday, July 11 12:30-14:00

Online Optimization for Dynamic Matching Markets

There are many situations in which present actions must be made and resources allocated with incomplete knowledge of the future. It is not clear in this setting how to measure the quality of a proposed decision strategy. Online optimization compares the performance of a strategy that operates with no knowledge of the future (on-line) with the performance of an optimal strategy that has complete knowledge of the future (off-line). In some cases, some probabilistic information about the future may be available. In this talk, we provide an overview of results obtained from that perspective on problems arising from dynamic matching markets such as (i) online auctions, (ii) display advertisements, (iii) kidney exchange programs, and (iv) ride-hailing platforms.

**Pinar Keskinocak**

Georgia Tech

Place: UPV Nexus

Date: Monday, July 9 14:30-16:00

Quantitative models embedded in decision-support tools for healthcare applications

We will discuss a few examples from healthcare, where quantitative models embedded in decision-support tools can improve the quality of decision-making (for patients, physicians, or caregivers) and patient outcomes. Examples will come from a variety of applications, including (i) organ transplant decisions for patients and physicians (considering the survival curve estimates of accepting an organ and undergoing transplant, versus remaining on the waiting list hoping to receive a better quality organ in the future), (ii) catch-up scheduling for vaccinations, (iii) prenatal screening for Down Syndrome, (iv) scheduling of patients to receive a combination of services.

**David Matchar**

Duke-NUS Medical School

Place: UPV Nexus

Date: Monday, July 9 12:30-14:00

Systems Modeling Impacting Policy: The Role Of Group Model Building In Cambodia

Health care is a prototypical example of a complex system. System modeling provides an opportunity to capture this complexity and to evaluate the potential positive and negative impacts of policy options and to gain insight into the factors that promote or inhibit success. Our experience in the health policy context has highlighted the crucial importance of engaging stakeholders from the outset so as to encourage a sense of ownership of the process; the idea is that owning the process encourages support of any resulting policy decisions and actions. In this talk, I will discuss the use of Group Model Building as the mechanism of stakeholder engagement, and describe several practical examples, focusing on current work in Cambodia to disseminate and evaluate services for chronic non-communicable diseases (NCDs). This effort is part of a 4-stage project with the ultimate goal of broadly implementing basic, efficient, and well-accepted NCD services throughout Cambodia.



Andrés L. Medaglia

Department of Industrial Engineering,
Universidad de los Andes, Colombia
IFORS Tutorial Lecture
Date: Wednesday, July 11 / 08:30-10:00

Solving Hard Shortest Path Problems with the Pulse Framework

Many challenging applications in the field of transportation and logistics often involve the solution of underlying large-scale network problems with shortest path structures.

The pulse framework implements ideas and strategies that have been available in the playground of network optimization for years, but when used collectively under a single framework they become stronger and are able to solve a wide array of hard shortest path problems. Initially, we proposed the pulse algorithm as an exact method for solving shortest paths with side constraints.

Later, we identified other shortest path variants where the same principle behind the pulse algorithm applied. In this tutorial, we present the pulse algorithm as a framework based on the idea of performing an implicit enumeration of the entire solution space supported by pruning strategies that efficiently discard a vast number of solutions.

We focus on the key aspects that have made possible the effective solution of several shortest path variants. We also illustrate the use of the pulse algorithm as a building block to solve hard combinatorial problems beyond the shortest path domain.



Dolores Romero Morales

Professor at Copenhagen Business School

Place: UPV Nexus
Date: Tuesday, July 10 12:30-14:00

MINLP and the cost of interpretability in Data Science

Data Science aims to develop models that extract knowledge from complex data and represent it to aid Data-Driven Decision Making. Mathematical Optimization has played a crucial role in the three main pillars of Data Science, namely Supervised Learning, Unsupervised Learning and Information Visualization. For instance, Quadratic Programming is used in Support Vector Machines, a Supervised Learning tool. Mixed-Integer Programming is used in Clustering, an Unsupervised Learning task. Global Optimization is used in MultiDimensional Scaling, an Information Visualization tool. Data Science models should strike a balance between accuracy and interpretability, enabling easy communication with the user who needs to interact with the models. In this lecture, we will navigate through several Mathematical-Optimization based models in Data Science that illustrate the important role of Mixed-Integer Nonlinear Programming in achieving such a balance.

**Anita Schoebel**

Professor at University Göttingen

Place: UPV Nexus

Date: Tuesday, July 10 14:30-16:00

Integrated Optimization in Public Transportation: Does it help?

Attractive and efficient public transportation is needed for satisfying the increasing mobility demand in an environmental-friendly way. In view of growing emissions, research on optimizing public transport is more relevant than ever.

The classical approach in public transportation planning is the following: After the network design, the lines and their frequencies are planned. Based on these, the timetable is determined, and later on the vehicles' and drivers' schedules. In order to account for the passengers, their routes are estimated after each of these stages and then used as input for the next stage.

These single planning stages are well understood and many of them can algorithmically be treated. However, following the above sketched sequential approach may be far away from finding an optimal solution for the whole system. This calls for integrated optimization.

In this talk we present approaches for integrated optimization in public transportation, apply them to benchmark examples and discuss how useful they are. While we focus on public transportation, many of the underlying ideas can also be used in other application areas.

Integrated versus sequential optimization.

The sequential procedure sketched above can be regarded as a Greedy approach: in each planning stage one aims at the best one can do. This usually leads to suboptimal solutions. On the other hand, many of these single steps are already NP hard such that solving the integrated problem to optimality seems to be out of scope. Nevertheless, we show how improvements can be made using the Eigenmodel as a framework for (heuristic) integrated optimization. We furthermore introduce the price of sequentiality as a measure how much can be gained by integrated approaches.

Integrating passengers' routes.

While many models in public transportation aim to minimize the traveling time of the passengers, the behavior of the passengers is not reflected realistically in most approaches. In many models, passengers are routed before the optimization. These routes are then fixed and are the basis for finding good line plans and timetables. We show that such a first routing has an immense impact on the resulting line plan, the timetable, the travel time and the costs. Better results are obtained if the routes of the passengers are variables which are determined within the optimization. However, these models are even harder to solve. We show two tricks to make such models tractable.

Finally, both aspects are combined, again in the framework of the Eigenmodel.

We also show how more realistic models such as taking the vehicles' capacities into account, or using logit models can be heuristically treated within this framework. In an outlook, we also sketch questions and ideas which may be relevant for integrated public transportation in the future.



Tamás Terlaky

Lehigh University and Harold S. Mohler Laboratory

Place: UPV Nexus

Date: Monday, July 9 8:30-10:00

Six Decades of Interior Point Methods: From Periphery to Glory

The basic concepts of Interior Point Methods (IPMs) were introduced by Frish in 1950's, and further developed in the 1960's, among others by Fiacco-McCormick (SUMT) and Dikin (Affince scaling). By the early 70's it was concluded that, mostly due to numerical instability, IPMs most probably will not be viable algorithms for solving large scale optimization problems.

Karmarkar's 1984 paper and the subsequent "Interior Point Revolution" fundamentally changed the landscape of optimization. IPMs become the method of choice to solve large-scale linear optimization problems, new classes of conic and convex optimization problems become efficiently solvable. The new powerful algorithmic and software tools opened new areas of applications. In this talk we walk through the history of IPMs, highlight the scientific and computer technology advances that make the Interior Point revolution possible.



Iris Vis

Dean of Industry Relations at the University of Groningen

Place: UPV Nexus

Date: Tuesday, July 10 10:30-12:00

Putting Operations Research to work

Visits to companies and non-profit organizations typically provide inspiration for challenging research projects. In this presentation, information will be given on the organization of public-private partnerships addressing societal challenges. Several examples of projects will be shown in which solving the real-life questions required the design of new OR-based models and solution approaches. Specifically, we will discuss the design of distribution networks for sustainable fuels for transportation, replenishment operations at ATMs, physical internet operations and logistics for education. For each of those projects, we will explain the start of the project, the creation of the consortium, the formulation of the research questions and methodology, the actual research and results obtained

3.4 SPECIAL SESSIONS

	Monday July 9	Tuesday July 10	Wednesday July 11
Morning A	MA 08:30-10:00 ROADEF	TA 08:30 -10:00 EEPA 1	WA 09:00 -10:00 ERC Session
Coffee break	10:00 - 10:30	10:00 - 10:30	10:00 - 10:30
Morning B	MB 10:30-12:00 Meet the editors ITOR	TB 10:30-12:00 EEPA 2	WB 10:30-12:00 Vendor sessions Gurobi, AMPL, Elsevier
	12:00 - 12:30	12:00 - 12:30	12:00 - 12:30
Lunch 12:00-14:30	Midday C MC 12:30-14:00 EDDA	TC 12:30-14:00 Meet the editors EJDP	WC 12:30-14:00 Meet the editors TOP
	14:00 - 14:30	14:00 - 14:30	14:00 - 14:30
Afternoon D	MD 14:30-16:00 Meet the editors EJOR	TD 14:30-16:00	WD 14:30-16:00
Coffee break	10:00 - 10:30	10:00 - 10:30	10:00 - 10:30
Afternoon E	ME 16:30-17:30 Roger Z. Ríos		16:30 - 17:30 Bus transfer to CAC
	17:45 - 19:00 Women in Science event	TE 18:00-19:00 IFORS Distinguished Lecturer Cynthia Barnhart	WE 17:30-18:30 Gerhard Woeginger
		20:00 Gala dinner	18:45 - 20:00 Closing session
			Closing party



Thanks to the success of the previous challenges, the French Operational Research and Decision Support Society (ROADEF) is organising jointly with the Association of European Operational Research Societies (EURO) the ROADEF/EURO challenge 2018-2019 dedicated to cutting optimization problem in collaboration with Saint-Gobain Group. Saint-Gobain Glass Industry (SGGI), part of the Saint-Gobain Group, is one of the world's leading flat glass manufacturers. It specialises in float glass manufacture and magnetron coated glass producing an array of glass types with different functions: transparency, thermal and acoustic insulation, safety, solar control, decoration, self-cleaning functions, etc. The products are intended for a wide variety of domestic and commercial applications including housing equipment (windows, bay windows, and interior design), facade, urban development and the realization of major projects. The problem objective is to reduce the glass loss for a given ordered bin set and a given item batch to cut. A special session will be organised for the Challenge and the sprint winners will be announced during the closing session of EURO 2018. Final winners will be announcing in 2019 at EURO Dublin, and last but not least, the overall amount of price is 45 000 €. It's time to register.

3.5 WOMEN IN SCIENCE EVENT

Web: euro2018valencia.com/women_in_science/

The WiS event will be held on Monday the 9th of July from 17:45 to 19:00, after the plenary session scheduled for that day of the conference, at the UPV Nexus.

Sponsored by



Round table schedule

17:45 – 18:00. Introduction.

18:00 – 18:45. Round table: the role of Women in Science and Technology: past, present and future.

18:45 – 19:00. Questions.

Note: Reservation in advanced will be necessary through the EURO Conference website.

Round Table speakers

- **Cynthia Barnhart.** MIT's Chancellor and the Ford Foundation Professor of Engineering Member of the National Academy of Engineering and the American Academy of Arts and Sciences.
- **Elena Fernández.** Full Professor at the Universitat Politècnica de Catalunya-BcnTech in Barcelona, Spain. President of EURO in 2015-2016.
- **Nuria Oliver.** Director of Data Science Research at Vodafone. Fellow of the European Association of Artificial Intelligence and IEEE fellow.
- **María Grazia Speranza.** Deputy Rector and Full Professor at the University of Brescia. President of EURO in 2011-2012. President-elect of IFORS.

Chairs of the session

- **Ana López Navajas.** Researcher linked to the Universitat de València and consultant on co-education at the Valencian Government.
- **Lucía Medea-García López.** Professor at the University of Lisbon. Previously consultant for the United Nations University (Institute on Globalization, Culture and Mobility).

3.6 THE “MAKING AN IMPACT” STREAM FOR PRACTITIONERS

Are you involved in practical applied OR? Do you want to know more about practical aspects, or meet other practitioners?

The “Making an Impact” stream, put together by industry practitioners from the EURO Working Group on Practice of OR, consists of participative workshops, panels and other activities designed to support, inspire and inform anyone involved in the practice of OR.

What’s on

Start with “Speed networking and Practice of OR” – meet others involved in practical OR, and find out more about the EWG-POR and get your conference off to a flying start (MA-55)

Then:

Join participative sessions led by practitioners from leading companies such as ORTEC, PTV Group, Jeppesen and IBM, including:

- OR in Practice: The Human Factor explore the consultancy skills essential to success
- Lost in Translation communicate with impact
- Which MIP-Solver find out how to get the best solver, by questioning our panel of heavy users and representatives from leading solvers
- Machine learning meets OR discover how you can make the most of these new opportunities
- Data Optimization R Us learn to harness the power of R for optimization, and the power of optimization for data science
- Measuring Impact get to grips with the challenges of measuring and demonstrating OR impact
- Agile SD: hands-on introduction to using system dynamics for business modelling

and more:

- academic-practitioner panel discussion on how to get the best from each other, with John Poppelaars, Sally Brailsford, Olli Braysi and Rommert Dekker;
- Fast and furious: Lightning talks
- Getting on in OR hear from senior professionals including John Hopes (President of the UK’s OR Society and previous head of EY’s Global Analytics group) about their careers, and consider your own options and professional development

The Making an Impact table in the exhibition hall will also be acting as a hub for promoting any organisations interested in employing OR practitioners, and matching anyone requiring a short 1-1 mentoring session with a mentor.

For full list of activities, details, and live updates, go to:

euro2018valencia.com/making-an-impact or visit the Making an Impact table. or contact us at mail euro2018valencia@upv.es

EURO AWARDS AND PRIZES

4. EURO AWARDS AND PRIZES

Sunday July 8	Monday to Wednesday	Monday July 9	Tuesday July 10	Wednesday July 11
	Morning A	MA 08:30-10:00 ROADEF CHALLENGE	TA 08:30 -10:00 EEPA 1	WA 08:30 -10:00
	Coffee break	10:00 - 10:30	10:00 - 10:30	10:00 - 10:30
	Morning B	MB 10:30-12:00	TB 10:30-12:00 EEPA 2	WB 10:30-12:00
		12:00 - 12:30	12:00 - 12:30	12:00 - 12:30
	Lunch 12:00-14:30	Midday C	MC 12:30-14:00 EDDA	TC 12:30-14:00
		14:00 - 14:30	14:00 - 14:30	14:00 - 14:30
14:00 - 20:00 Registration open	Afternoon D	MD 14:30-16:00	TD 14:30-16:00	WD 14:30-16:00 EthOR Award 2018 (EWG on Ethics and OR)
	Coffee break	16:00 - 16:30		16:00 - 16:30
	Afternoon E	ME 16:30-17:30 Plenary		16:30 - 17:30 Bus transfer to CAC
17:30 - 19:00 Opening session EGM 2018 EDSM 2018		17:45 - 19:00 Women in Science event	TE 18:00-19:00 Plenary	WE 17:30-18:30 Plenary
Welcome party			20:00 Gala dinner	18:45 - 20:00 Closing session EDDA 2018 EEPA 2018 EABEP 2018
				Closing party

EURO Gold Medal (EGM 2018)

The EURO Gold Medal (EGM) is the highest distinction within OR in Europe. The award is conferred on a prominent person or team or institution, for an outstanding contribution to the OR science. The award will be officially bestowed at the **opening plenary session**.

Members of the 2018 Jury:

- Luk Van Wassenhove (France) - chair
- M. Grazia Speranza (Italy)
- Marielle Christiansen (Norway)
- Juan José Salazar González (Spain)
- David Lane (UK)

EURO Distinguished Service Medal Award (EDSM 2018)

The EURO Distinguished Service Medal is awarded for recognition of distinguished service to the Association of European OR Societies (EURO) and to the profession of OR. The award will be officially presented at the **opening plenary session**.

Members of the 2018 Jury:

- Ulrike Leopold-Wildburger (Austria) - chair
- Roman Slowiński (Poland)
- Pascale Zaraté (France)
- Sally Brailsford (UK)
- Hans Ittmann (South Africa)

EURO Doctoral Dissertation Award (EDDA 2018)

The purpose of the EURO Doctoral Dissertation Award is to distinguish an outstanding doctoral dissertation in Operational Research, defended in the countries having an OR society that is a member of EURO. Three finalists will present their work at a **special session** during the conference (Session Monday Midday C, July 9: MC 12:30-14:00, EDDA).

2018 Finalists:

- Maria Margarida da Silva Carvalho: Computation of Equilibria on Integer Programming Games
- Martin Luipersbeck: Large-scale Network Optimization: Steiner Tree Problems
- Maximilian Schiffer: Logistics Networks with Intermediate Stops – Designing Innovative and Green Solutions

The award will be presented to the winner at the **closing session**.

Members of the 2018 Jury:

- Richard Hartl (Austria) - chair
- Bernardo Almada-Lobo (Portugal)
- Hande Yaman (Turkey)
- Jutta Geldermann (Germany)
- Julia Bennell (UK)

EURO Excellence in Practice Award (EEPA 2018)

The EURO Excellence in Practice award is for the best submission and presentation describing an application of Operational Research in practice. This year there are six finalists who will present their work during special sessions during the conference.

2018 Finalists:

- Martin Bichler, Douglas Ferrell, Vladimir Fux, Jacob Goeree: A Combinatorial Exchange for Fishery Access Rights
- Guillermo Durán (University of Buenos Aires), Mario Guajardo (NHH Norwegian School of Economics), Denis Sauré: Scheduling the South American Qualifiers to the 2018 FIFA World Cup by Integer Programming
- Valentina Ferretti, Elisa Gandino: Operational Research as a Driver for Rural Regeneration
- Martina Fischetti, Jesper Runge Kristoffersen, Michele Monaci, David Pisinger: The OR Revolution in Vattenfall BA Wind
- David C. Lane, Eileen Munro, Elke Husemann: Blending Systems Thinking Approaches for Organisational Analysis: Reviewing Child Protection in England
- Sascha Wörz, Michael Schmid, Heinz Bernhardt: An Efficient Algorithm for Milk Transport Logistic Optimization Developed for the Dairy Industry enterprise Zott SE & Co. KG

The award will be presented to the winner(s) at the **closing session**.

Members of the 2018 Jury:

- Ulrich Dorndorf (Germany) – chair
- Erik Demeulemeester (Belgium)
- John Poppelaars (The Netherlands)
- Adam Ouorou (France)
- Karl Dörner (Austria)

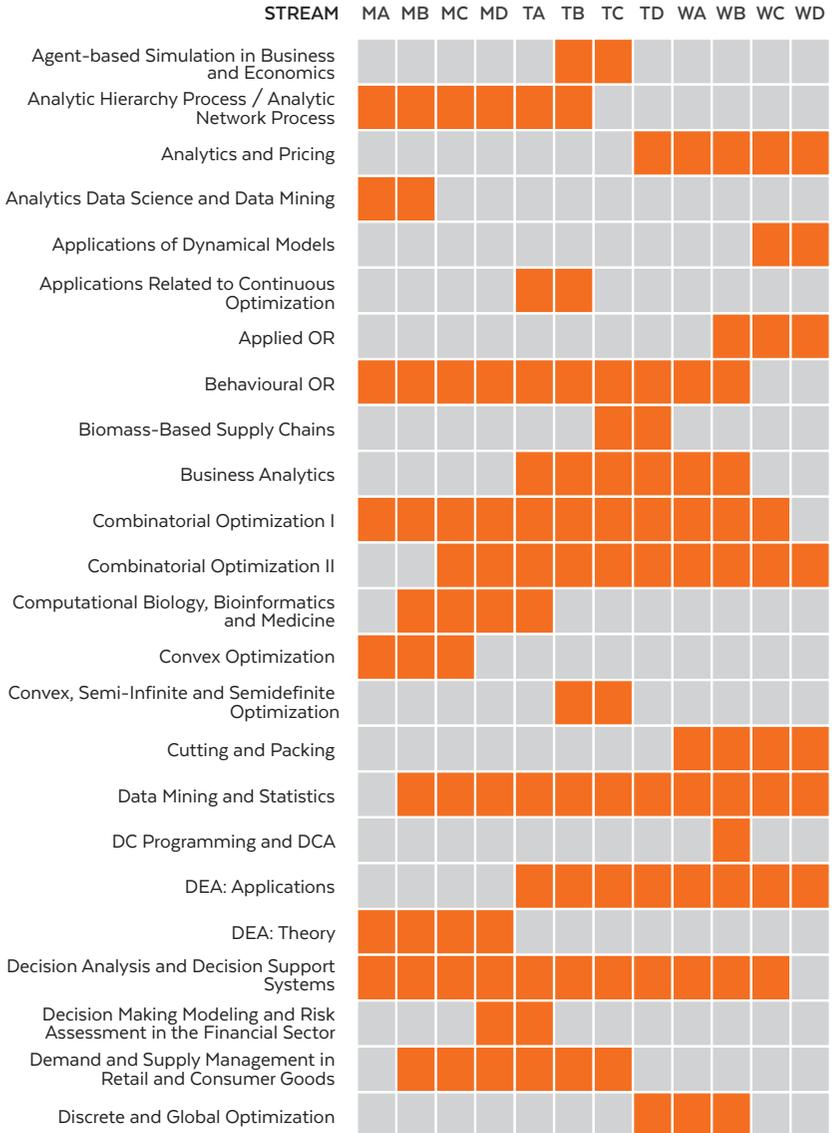
EURO Award for the Best EJOR Paper (EABEP 2018)

EURO has three annual awards available for papers published by EJOR: best survey paper; best application paper; and best theory/methodology paper. Winners for each category have been selected by a jury and these awards will be presented at the closing session.

Members of the 2018 Jury:

- Stein Wallace (Norway) – chair
- Ana Barbosa-Povoa (Portugal)
- Stavros Zenios (Cyprus)
- Robert Dyson (UK)
- Stefan Røpke (Denmark)

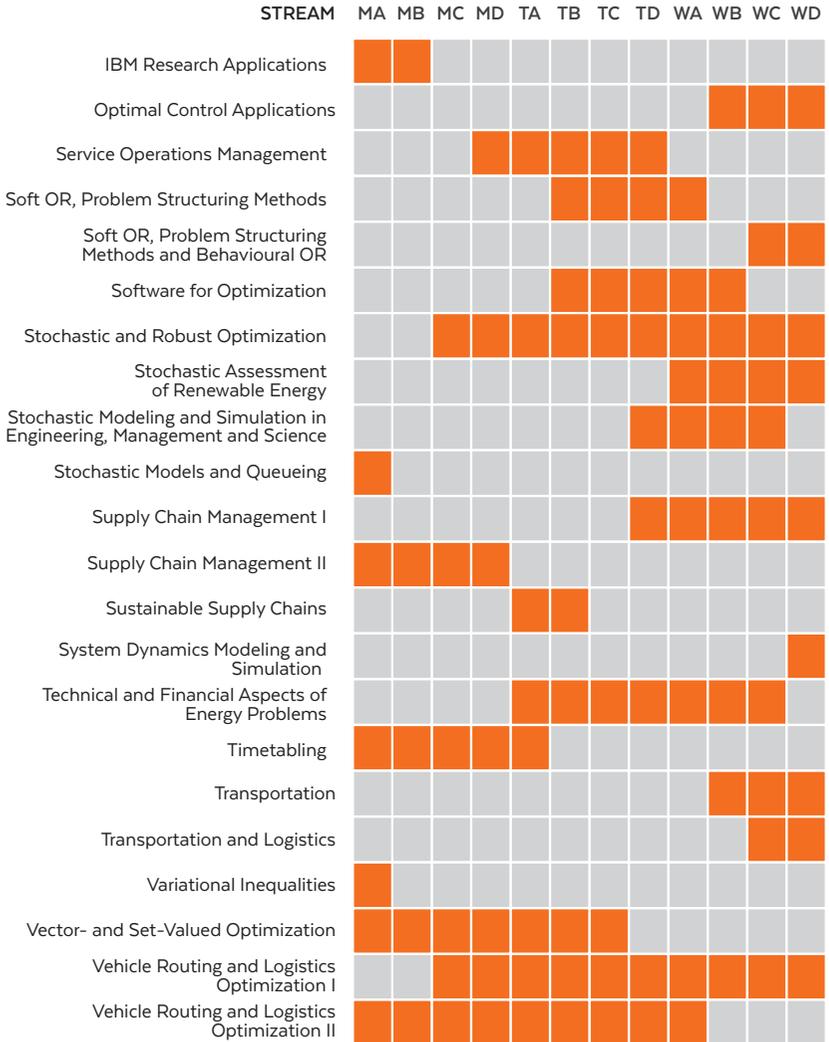
STREAMS OVERVIEW



STREAM	MA	MB	MC	MD	TA	TB	TC	TD	WA	WB	WC	WD
Discrete Optimization, MIP and MINLP												
Dynamic and Stochastic Scheduling												
Dynamic Models in Game Theory												
Dynamical Models in Sustainable Development												
Dynamical Systems and Mathematical Modelling in OR												
Emerging Applications in Portfolio Selection and Management Science												
Emerging Applications of Data Analysis												
Energy Economics, Environmental Management and Multicriteria Decision Making												
Engineering Optimization												
Environmental Sustainability in Supply Chains												
European Working Group: Data Science Meets Optimization												
Financial Mathematics and OR												
Financial Modeling, Risk Management and Managerial Accounting												
Fintech: Economic and Financial Challenges in Cryptocurrencies												
Fuzzy Optimization												
Game Theory and Mathematical Economics												
Game Theory and Operations Management												
Game Theory Solutions and Structures												
Global Optimization												
Graphs and Networks												
Green Logistics												
Healthcare Logistics												
Humanitarian Operations												
Hyperheuristics												

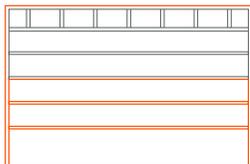
STREAM	MA	MB	MC	MD	TA	TB	TC	TD	WA	WB	WC	WD
Insurance and Pension Risk Management	█	█										
International Aspects of OR							█	█				
Location Analysis and Optimization	█	█	█	█	█	█	█	█				
Long-term Planning in Energy, Environment and Climate									█	█	█	
Lot Sizing, Lot Scheduling and Production Planning								█	█	█	█	█
Machine Learning												█
Making an Impact	█	█	█	█	█	█	█	█	█	█	█	█
Maritime Transportation							█	█	█	█	█	
Matheuristics							█					
Memory-based Heuristics									█	█	█	
Metaheuristics	█	█	█									
Mixed-Integer Linear and Nonlinear Programming	█	█										
Moments in History of OR			█									
Multiobjective Optimization			█	█	█	█	█	█	█	█	█	█
Multiple Classifier Systems and Applications	█	█	█									
Multiple Criteria Decision Aiding	█	█	█	█	█	█	█	█	█	█	█	
Network Optimization and Social Networks	█	█	█	█								
New Challenges in Investment Strategies, Risk and Financial Modelling				█	█	█	█	█	█			
Nonlinear Programming: Methods	█	█	█	█	█	█	█	█				
Nonlinear Programming: Theory									█	█	█	█
Numerical and Simulation Methods in Finance			█	█								
Operational Research in Financial and Management Accounting	█	█										
Operations/Marketing Interface			█	█	█	█						
Optimal Control						█						

STREAM	MA	MB	MC	MD	TA	TB	TC	TD	WA	WB	WC	WD
Optimization in Renewable Energy Systems		■	■	■	■	■	■	■				
OR Advances in Agribusiness		■	■	■								
OR and Ethics									■	■	■	■
OR Education		■	■	■	■	■	■					
OR for Developing Countries		■	■	■	■	■						
OR for Health and Care I	■	■	■	■	■	■	■					
OR for Health and Care II							■	■	■	■	■	■
OR for Sustainable Development	■	■										
OR in Agriculture, Forestry and Fisheries				■	■	■	■	■	■			
OR in Neuroscience	■											
OR in Quality Management	■	■										
OR in Sports					■	■	■	■	■			
OR in the Physical Internet												■
OR in Water and Hydro Energy Management											■	■
Production and Operations Management									■	■	■	■
Production Service and Supply Chain Management	■	■	■	■	■	■	■	■	■	■	■	■
Project Management and Scheduling	■	■	■	■	■							
Public Transportation I	■	■	■	■	■	■	■	■	■	■	■	■
Public Transportation II							■	■				
Routing, Logistics, Location and Transportation	■	■	■	■	■	■	■	■	■	■		
Scheduling Practice	■	■	■	■								
Scheduling Theory										■	■	■
Scheduling with Resource Constraints										■	■	■
Scheduling, Timetabling and Project Management												■

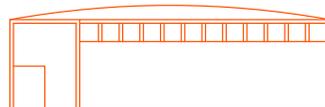


MAPS

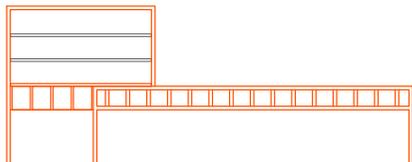
VNIVERSITAT D VALÈNCIA · Campus de Burjassot



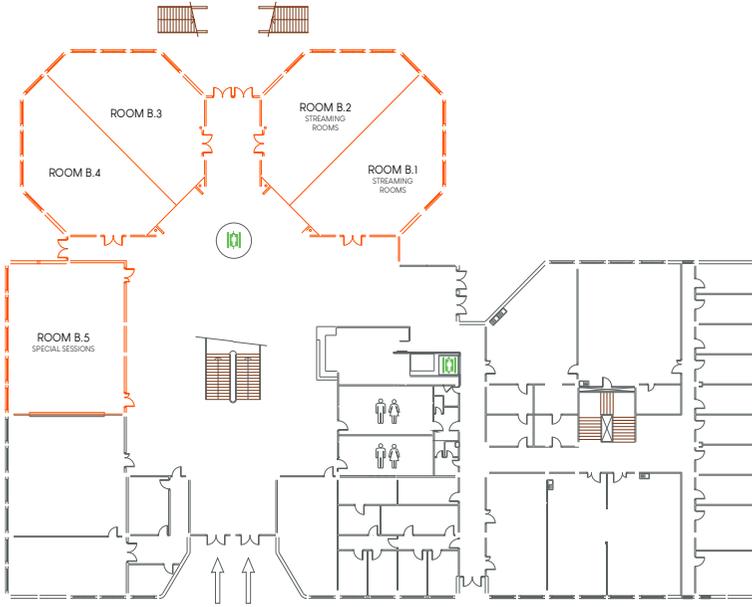
4D BUILDING UPV
GROUND FLOOR
 SESSION ROOMS B1 – B5
1ST FLOOR
 SESSION ROOMS 1.1 – S 1.6
2ND FLOOR
 SESSION ROOMS 2.1 – S 2.5



SPORTS PAVILION
 REGISTRATION / PICNIC TAKE AWAY

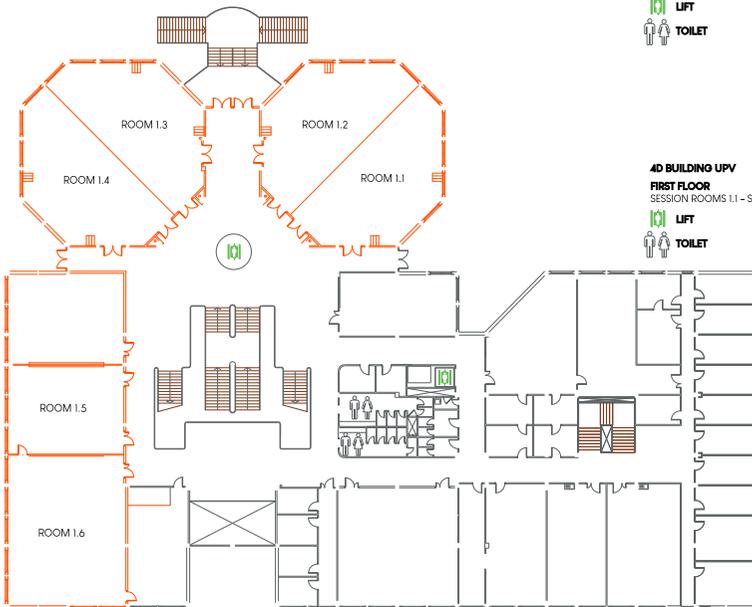


NEXUS AUDITORIUM UPV
1ST FLOOR
 PLENARIES, KEYNOTES AND OPENNING SESSIONS
2ND FLOOR
 MEETING ROOMS



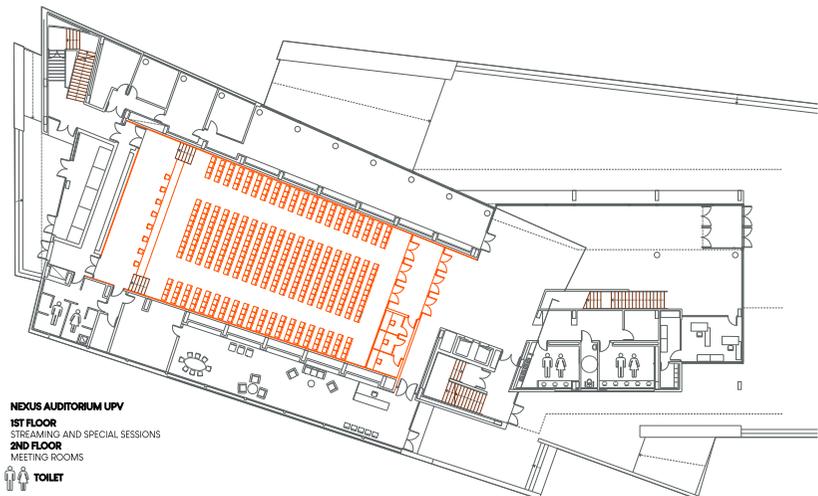
4D BUILDING UPV
GROUND FLOOR
SESSION ROOMS B1 – B5

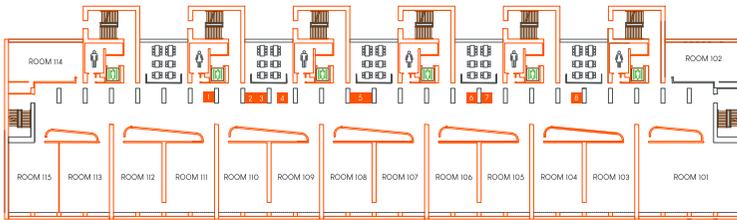
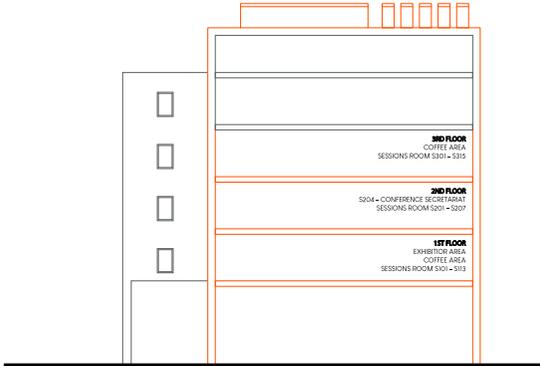
- LIFT
- TOILET



4D BUILDING UPV
FIRST FLOOR
SESSION ROOMS I.1 – I.6

- LIFT
- TOILET





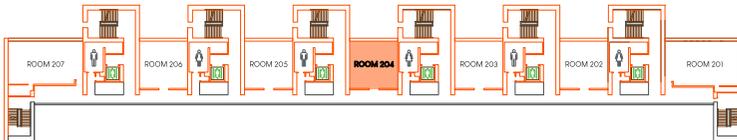
FIRST FLOOR - SOUTH CLASSROOM BUILDING UV

SESSIONS ROOMS

EXHIBITORS

- ▶ VULF
- ▶ VDS
- ▶ VSD
- ▶ USEVER
- ▶ GILFORD OPTIMIZATION, INC
- ▶ AMPH, OPTIMIZATION, INC
- ▶ SPRENCH NATURE
- ▶ TAYLOR & FRANCIS GROUP

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- T TOILET

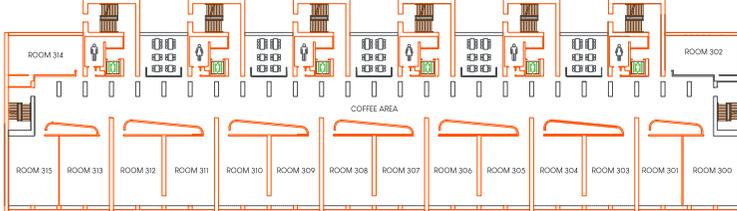


SECOND FLOOR - SOUTH CLASSROOM BUILDING UV

SESSIONS ROOMS

ROOM 204 - CONFERENCE SECRETARIAT

- U LIFT
- T TOILET



THIRD FLOOR - SOUTH CLASSROOM BUILDING UV

SESSIONS ROOMS

COFFEE AREA

- U LIFT
- T TOILET



SPECIAL ISSUES

The following journals are preparing special issues about topics related to the EURO 2018 conference



Annals of Operations Research
Agriculture Analytics, BigData, and Sustainable Development
Guest editors: Antonio Mauttone, Reinaldo Morabito and Lluís Miquel Plà-Aragonès

Submission deadline 31 July 2018.



EURO Journal on Decision Processes
Behavioral OR
Guest editors: Alberto Franco and Raimo Hämmäläinen



IEEE Transactions on Fuzzy Systems
Fuzzy Analytics and Stochastic Methods in Neurosciences
Guest editors: Erik Kropat, Gerhard-Wilhelm Weber and Metin Turkey

Submission deadline 31 July 2018.



Annals of Operations Research
Operations Research for Neuroscience II
Guest editors: Erik Kropat, Ruben A. Tikidji-Hamburyan and Gerhard-Wilhelm Weber

Submission deadline 1 December 2018.



Central European Journal of Operations Research
OR for Sustainable Development
Guest editors: Elise del Rosario, Begoña Vitoriano, Sadia Samar Ali and Gerhard-Wilhelm Weber

Submission deadline 1 September 2018.



Production Planning and Control
Operations management and collaboration in Agri-Food Supply Chains
Guest editors: Jorge E Hernandez, Herve Panetto, Nicola Calabrese and David Martinez

Submission deadline: 1 November 2018.



Operations Research for Health Care
Innovative methods and uses of O.R. in health and care applications
Guest editors: Inês Marques, Derya Demirtas, Sebastian Rachuba and Christos Vasilakis

Submission deadline 1 October 2018.



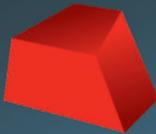
Annals of Operations Research
Recent developments in Financial Modeling and Risk Management
Guest editors: Roy Cerqueti, Rita L. D'Ecclesia, Susanna Levantesi

Submission deadline 31 October 2018.

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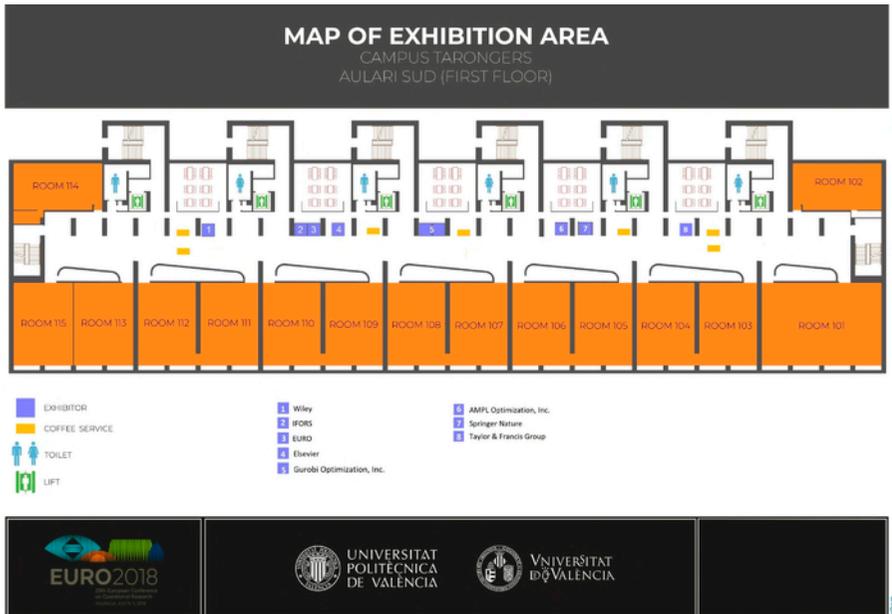
www.elsevier.com
contact person: Simon Jones - Associate Publisher
s.jones@elsevier.com

EXHIBITION HALL MAP & HOURS

Opening times of exhibition area:

Monday, July 9, 2018 to Wednesday, July 11 from 08.30h - 16.30h

Map



EXHIBITORS



Taylor & Francis Group
an **informa** business

www.tandfonline.com
Contact person:
Ian.Challand@tandf.co.uk

WILEY

www.wiley.com

IFORS
INTERNATIONAL FEDERATION OF OPERATIONAL RESEARCH SOCIETIES

ifors.org
IFORS Secretary:
secretary@ifors.org

SPRINGER NATURE

www.springernature.com



Euro 2019 Conference Secretariat
www.euro2019dublin.com
euro2019dublin@abbey.ie



USEFUL INFORMATION

9.1 REGISTRATION

The registration and information desk will be located in the Sports Pavilion of the Universitat Politècnica de València (Sunday and Monday) and at room S204 South Building of the Universitat de València (Tuesday and Wednesday).

Sunday 14:00 – 19:00 (2.00 – 7.00 pm)

Monday 07:30 – 18:00 (7.30 am – 6.00 pm)

Tuesday 08:00 – 15:00 (8.00 am – 3.00 pm)

Wednesday 10:00 – 15:00 (10.00 am – 3.00 pm)

9.2 SESSION GUIDELINES

Speakers can find the location of their session via the mobile app and in the complete official programme, available on the website in PDF format. Sessions normally last for 90 minutes and include 4 talks. Therefore, in order to allow time for questions, all speakers are kindly requested to prepare their presentations to last 20 minutes, even if their session includes less than 4 speakers. As a speaker, you should arrive at the room where your session is to take place at least 10 minutes before it is scheduled. Once there, contact the chair so you have time to set up your presentation on the room-computer, to which presentations should be copied from your own USB stick.

Session chairs must ensure that their sessions start and end on time, and that presentations are made in the order shown in the official programme. If a speaker does not show up, please keep to the original schedule, in order to facilitate session jumping. If the session chair is absent, the first speaker in the session will replace him/her. Check that all presentations are correctly set up in the computer before the beginning of the session. Let speakers know when they are nearing the end of their presentation time (5 minutes and 1 minute).

Equipment in all session rooms at EURO 2018 includes a PC and a beamer. There is no need for speakers to bring their laptops to the rooms. We even have spare laptops in case there is a problem with the PC in the room. A session will already be open on the PC in each room. Alternatively, speakers will be able to log in on the UPV premises with their EDUROAM username and password. Please note that we do not provide electric adapters or VGA/HDMI adapters for connecting speakers' laptops. Depending on the room, connecting a laptop might not be easy or even feasible, so we strongly recommend that speakers bring their presentations on a USB drive and use the PC available in each room. The laptops have the Windows 10 and Windows 7 operating system, Powerpoint 2016 and the latest version of Adobe Acrobat PDF reader.

9.3 CONFERENCE APP, WI-FI CONNECTION AND EMERGENCY PHONE NUMBERS

EURO 2018 Valencia smartphone app provides you with the most comfortable tool for planning your participation in the 29th European Conference On Operational Research. Browse the complete programme directly from your phone or tablet and create your very own agenda on the fly. The app is available for Android, iOS and Windows Phone devices.

To download mobile app, please visit <http://scan.conference4me.psnr.pl/get/?config=euro2018> or scan the QR code or type 'euro valencia' in Google Play, iTunes App Store or Windows Phone Store.



WiFi access is available on both the UV and the UPV campuses via the eduroam network (your device may need to be configured at your host institution). You will find details of your username and password for eduroam, which are unique to each participant, in your bag.

Emergency phone numbers

EURO 2018 Ambulance: +34 672 325 666
Security UPV: +34 963879999, +34 963877703
Security UV: +34 669883166, +34 669883177, +34 669883190
General Emergencies: 112

Contact information

E-mail: euro2018valencia@upv.es **Facebook:** [Facebook.com/euro2018vlc](https://www.facebook.com/euro2018vlc)

Website: euro2018valencia.com **Twitter:** twitter.com/euro2018vlc

Instagram: [instagram.com/euro2018vlc](https://www.instagram.com/euro2018vlc)

9.4 LUNCHES, COFFEE BREAKS AND TRANSFERS

LUNCHES

Lunchtime will be a social event for EURO2018 attendees. Lunch will be available in the Sports Pavilion of the Universitat Politècnica de València from 12:00 until 14:30 (2.30 pm) on Monday, Tuesday and Wednesday (see the areas depicted as "INDOOR / OUTDOOR PICNIC AREA" at the main venue maps in Section 6). Lunches will be served in picnic baskets (food, drinks, plates & napkins). There will be indoor and outdoor areas at the conference venue where attendees can take this type of lunch, encouraging them to meet—and talk to—new people.

For organizational purposes we need to kindly remind you of the following points:

- 1) Lunches must be eaten within the designated areas.
- 2) Food and drinks are not permitted in the classrooms.
- 3) Picnics are to be eaten as soon as they are served.

We remind you that special menus are available for all meals, coffee breaks and cocktail receptions offered at the conference. In particular, menus are provided for vegans and for people with coeliac disease, lactose intolerance or cultural constraints.

COFFEE BREAKS

Coffee breaks will be served near of the sessions rooms. Please follow the signs.

CLOSING SESSION. FREE SHUTTLE BUS SERVICE

On Wednesday afternoon, a free shuttle bus service will be provided by the organization, connecting the conference venue (Meeting point: See bus sign in front of the SPORTS PAVILION at the main venue maps in Section 6) with the Ciudad de las Artes y las Ciencias, where the last plenary talk and the closing session and closing party will take place.

9.5 URBAN TRANSPORT IN VALENCIA

There is an extensive public transport network covering the city, including buses, metro (underground/subway), trams and taxis.

We remind you that the registration fee includes a transfer ticket valid for 8 prepaid trips within the city (Zone A), with transfers permitted between the underground/-subway network (Metrovalencia), bus (EMT) and MetroBus.

 <p>EMT VALENCIA</p> <p>BUS</p>	<p>Single ticket (bought on the bus): €1.50. Also available: Bonobus (10 prepaid trips, bought at newsagents/news stands or tobacconists for €8.50 by recharging your card). www.emtvalencia.es/ciudadano/index.php Download app: www.emtvalencia.es/app.php</p>
 <p>METRO</p>	<p>Single ticket: €1.50 for a journey within the city (Zone A), €3.90 between the city and the airport. Also available at metro stations: Bonometro (10 prepaid trips, €7.60 within Zone A). Combined bus-underground tickets valid for 1-3 days are also available at newsagents/news stands or tobacconists. www.metrovalencia.es/page.php?idioma=en Download app: www.metrovalencia.es/wordpress/?page_id=413</p>
 <p>TAXI</p>	<p>Taxis are not expensive (though there is a minimum fare of €4 during the day and €6 after 21:00), and you can pick them up at taxi ranks or stop them in the street, or ask the reception desk to call one for you.</p>
 <p>valenbisi</p> <p>BICYCLE</p>	<p>Valenbisi: Valencia's public bicycle-sharing system, with numerous docks around the city. Unlimited trips for one week: €13.30. An ecological and healthy option available 24 hours a day, 365 days a year. www.valenbisi.com/What-is-Valenbisi</p>

HOW TO GET FROM THE CITY TO THE UPV AND UV CAMPUS BY COLLECTIVE PUBLIC TRANSPORT

Bus

The red city buses run daily from 6:30 to 22:30 (6.30 am to 10.30 pm) at frequent intervals (see the information panels). The routes that serve the conference venue are 18, 40, 71, 93 and 98. As a hint, look for buses going to Universitat or Passeig Marítim and get off at Tarongers.

Metro

The stops nearest to the conference venue are La Carrasca or Tarongers (line 4 or line 6). Look for your best route on the Valencia metro network. You may need to transfer at Benimaclet (lines 3, 4 and 6) or at Empalme (lines 1 and 4).

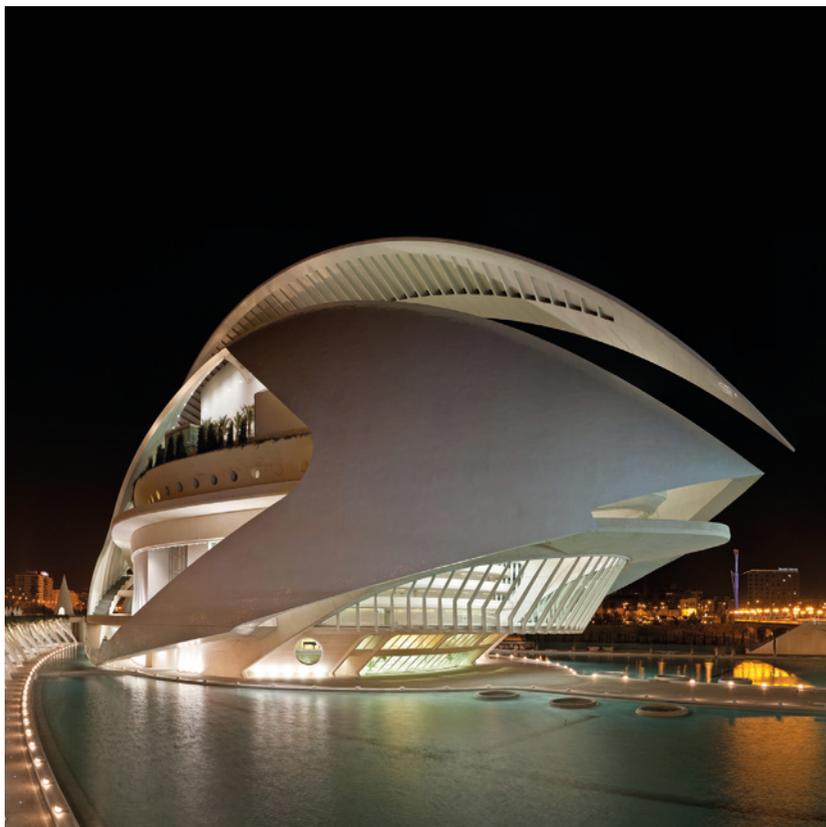
SOCIAL PROGRAMME

WELCOME PARTY (JULY 8, 2018)

19:00 (7 pm). Having collected your conference bag and attended the opening session, you can meet friends and colleagues at the welcome party on the UPV campus.

The welcome party will start at 19:00 with a typical Valencian *mascletà* (a traditional firecracker display—be prepared to cover your ears!). We will also enjoy cocktails with live music (Sedajazz Big Band).





GALA DINNER **(July 10, 2018)**

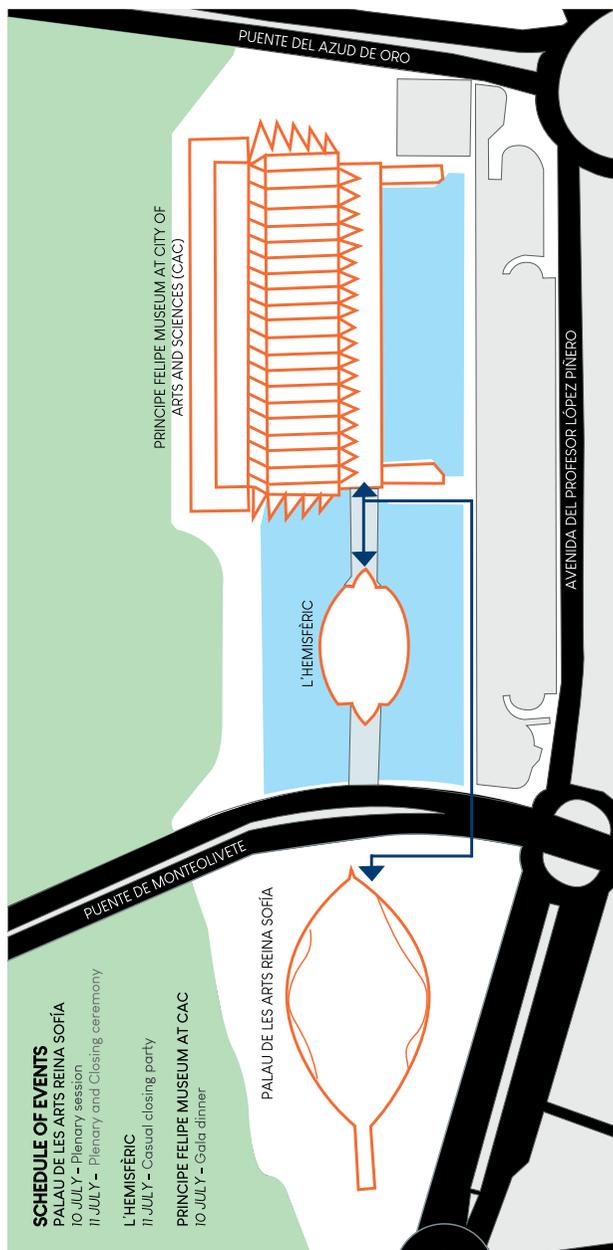
20:00. After attending the Plenary Conference of Cynthia Barnhart at the Palau de les Arts Reina Sofia (Ciutat de les Arts i les Ciències de València-CAC), the EURO 2018 Gala Dinner will be held at the Príncipe Felipe Science Museum (CAC).

You are also invited to attend a Valencian fireworks (noise, light, colors and smoke) on Tuesday night, and live music by the group Mohannad Nasser (by Berklee School), they play Brazilian and Flamenco music with Arab influences.



CASUAL CLOSING PARTY **(July 11, 2018)**

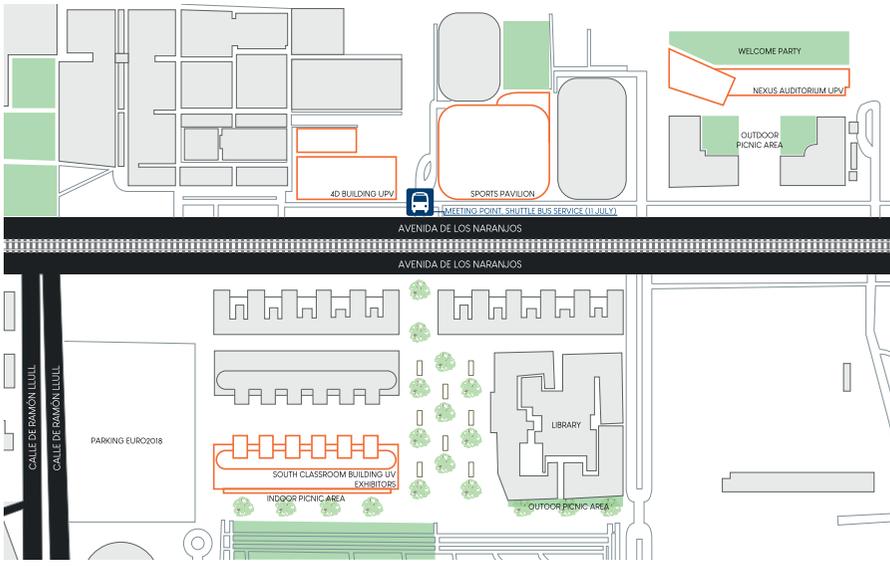
20:00 (8 pm). Do not miss this opportunity to say goodbye to the friends and colleagues you will have met at the EURO2018 conference. After Gerhard Woeginger's plenary lecture and the Closing Session, both at the City of Arts and Sciences, we will enjoy these final moments together at the nearby *Hemisfèric* building, where live music will be offered by *Xaranga La Figarmònica*, and farewell cocktails will be served





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