



*Institute for Operations Research  
and the Management Sciences*



# INFORMS Israel 1998

## MANAGEMENT SCIENCE AND OPERATIONS RESEARCH IN AN EMERGING REGION

**JUNE 28 - JULY 1, 1998**

*Sponsored by*

*Institute for Operations Research and the Management Sciences (INFORMS)*

*in cooperation with*

*Tel Aviv University*

*and*

*Operational Research Society of Israel - ORSIS*

### MESSAGE FROM THE GENERAL CHAIRS

We welcome you to the 1998 INFORMS/ORSIS Joint International Meeting in Tel Aviv. A diverse society situated at one of the world's major crossroads joining Europe, Asia and Africa, Israel is a true cosmopolitan country. Recent developments in the Middle East have made Israel one of the world's fastest growing economies with the expectation that the region will emerge as a world economic power.

Israel, which celebrated last month 50 years of existence, reflects the ancient and the new. As the Holy Land it is home to ancient sites of major world religions. This, combined with modern developments in architecture, industry and infrastructure, makes the country a tourist and business attraction.

The theme of the meeting is "Management Science and Operations Research in an Emerging Region", reflecting the role of the various disciplines to the economic and business success of emerging industries as well as of the Middle Eastern countries and the region as a whole. OR/MS researchers and practitioners will have the opportunity to share ideas and work together to find ways to enhance industrial operations in emerging economies especially in high-tech, service industries and the public sector.

The conference is held on the campus of Tel Aviv University, the largest university in Israel. The 220-acre modern campus, located in Israel's cultural, financial and industrial heartland, a major center of teaching and research, serving 20,000 students, comprising of nine faculties, 106 departments, and over 75 research institutes. The university enjoys extensive research contacts with leading overseas academic and scientific institutions as well as with major Israeli businesses and industries.

The main hotel is the Ramada Continental situated on Tel Aviv's famous promenade, along the Mediterranean shore and is a short walk away from the bustling city center of Tel Aviv. The city's culture, entertainment and business centers, as well as its fashionable shopping, are at your doorstep. There is a second hotel - the Grand Beach hotel just few blocks up the street.

We have prepared an exciting program. The opening session on Monday 10:30 will include Professor Aharoni as our keynote speaker. We have seven semi-plenary speakers, 20 parallel tracks with 200 sessions, 650 papers, covering a wide variety range topics from telecommunication to internet, www, organization, production, supply chain, applied probability, marketing and many others. We hope you will find the program stimulating.

The social program will include a short get-together on Sunday evening. The main reception will be on Monday evening at the Loft in the old Jaffa port. The 5,000 year long history of Jaffa port (or inally called Joppa, the most ancient such facility in the world), with its adjacent reconstructed ancient quarter, makes it a must on every tourist's agenda. The Loft serves truly authentic Israeli gastronomic dishes. The Loft is a short 5 minute walk from the lovely art quarter of painters, galleries, antiques shops, and other interesting tourists attractions. We provide a shuttle buses from the hotel to the Loft. On Tuesday evening we plan to have an optional dinner at the Green House Restaurant. Formerly the opulent home of a prominent Sheik, built last century, was restored in 1992 to become the Tel-Aviv University Faculty Club. In addition, this unique setting includes the Green Restaurant, which offers a modern menu of European style cuisine of the highest international culinary standards.

Three tours are available to you during the conference to some of the best tourist attraction sites: Jerusalem Tour, Sunday, June 28 (Full Day). Depart hotel and drive directly to Jerusalem via the main highway. Ascend the Mt. of Olives and enjoy the panoramic view of the Golden City. Descend via the Kidron Valley and continue to the Old City for a walking tour, which includes the Christian Quarter. Walk along the Via Dolorosa to the Church of the Holy Sepulchre. Walk through the colorful Ara Market and enter the Jewish Quarter. Walk along the reconstructed Cardo, formerly a market place, and view the Western Wall, the last remnant of the Jewish Temple. Depart the Old City and drive to the Israel Museum to view the Dead Sea Scrolls housed in the Shrine of the Book.

Caesarea Tour, Monday, June 29 (Half Day). Depart Tel Aviv and drive via the Coastal Highway to the old crusader city of Caesarea. Visit the open-air theater now restored and used as one of Israel's leading concert venues. Visitors walk across the drawbridge of the moat through the guardhouse and into the ruins of the Old City. Stroll through the cobbled streets, warehouses and well-preserved port. Continue to Zichron Yaacov and visit the Gardens of Ramat Hanadiv (Hill of the Philanthropist) named in memory of Baron de Rothschild, whose impressive vaulted tomb lies here.

Jaffa Tour Tuesday, June 30 (Half Day). Depart hotel and drive past Rabin Square to view the memorial dedicated to the former Prime Minister Itzak Rabin located at the place where he was assassinated during a peace rally in November 1995. Continue to Dizengoff Street with its quaint boutiques and coffee shops. Pass the Mann Auditorium, home of the Israeli Philharmonic Orchestra. Visit the Carme Market and enjoy a walk down the colorful lanes with displays of fruit and vegetables. Proceed to the old port of Jaffa for a visit to the Old Port, now an artist's quarter. Walk down the cobbled stones and browse through the galleries and pottery stores.

On behalf of INFORMS , we want to offer our thanks to our colleagues and supporting academic institutions Tel Aviv University, University of Michigan-Dearborn, ORSIS; and particularly to the extremely hardworking members of the organizing committees, cluster chairs, and many others who help make this meeting possible.

This is the second time INFORMS is having a meeting in Israel. Back in June 1973, The Institute of Management Science (TIMS) held its XX International meeting in Israel. Many of us still remember the 1973 successful meeting. Our challenge is to make the 1998 meeting even better. For those who have not seen Israel since 1973, you are up for a big surprise!

We extend our warmest welcome to all of you and trust that you will enjoy this memorable and exiting meeting.

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# Ant Colony Optimization

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**Session:** [MD13](#)

**Date/Time:** Monday 15:45-17:15

**Type:** Invited

**Sponsor:**

**Track:**

**Cluster:** Heuristic Programming & Applications

**Room:**

**Chair:** Marco Dorigo

**Chair Address:** Univ. Libre de Bruxelles, IRIDIA CP 194/6, Ave. Franklin Roosevelt 50, Bruxelles, 1050 , Belgique

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**Chair:**

**Chair Address:**

**Chair E-mail:**

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## MD13.1 Ant Colony Optimization: A New Metaheuristic?

- Marco Dorigo; Univ. Libre de Bruxelles, IRIDIA CP 194/6, Ave. Franklin Roosevelt 50, Bruxelles, 1050 , Belgique; [mdorigo@ulb.ac.be](mailto:mdorigo@ulb.ac.be) [iridia.ulb.ac.be/dorigo/dorigo.html](http://iridia.ulb.ac.be/dorigo/dorigo.html)

I will sketch the main idea behind the ant colony optimization paradigm and discuss its possibilities as a new metaheuristic.

## MD13.2 Hybrid Ant System for the Sequential Ordering Problem

- Luca-Maria Gambardella; IDSIA, Corso Elvezia 36, Lugano, CH-6900 , Switzerland; [luca@idsia.ch](mailto:luca@idsia.ch)
- Marco Dorigo; Univ. Libre de Bruxelles, IRIDIA CP 194/6, Ave. Franklin Roosevelt 50, Bruxelles, 1050 , Belgique; [mdorigo@ulb.ac.be](mailto:mdorigo@ulb.ac.be) [iridia.ulb.ac.be/dorigo/dorigo.html](http://iridia.ulb.ac.be/dorigo/dorigo.html)

We present HAS-SOP, a hybrid ant colony algorithm coupled with a local optimizer applied to various instances of the SOP. We compare HAS-SOP with some of the best heuristics available for the SOP. Experimental results show that HAS-SOP is the best performing method for SOPs and is able to improve many of the best known published results.

## MD13.3 An Ant Colony Optimization Approach to the Quadratic Assignment Problem

- Thomas Stuetzle; TU Darmstadt, Comp. Sci. Dept., Intellectics Group, Darmstadt, D-64283 , Germany; [tom@intellektik.informatik.tu-darmstadt.de](mailto:tom@intellektik.informatik.tu-darmstadt.de)

We discuss the application of one specific ant colony optimization approach, MAX-MIN ant system, to the QAP. Artificial ants are used to construct solutions that are subsequently improved by a local search phase. The computational results show that the presented approach is very efficient on real-life QAPs.

#### **MD13.4 Ant Colony Optimization in Distribution Management**

- Bernd Bullnheimer; Univ. of Vienna, Inst. of MS, Bruenner Str.72, Vienna, A-1210 , Austria; [bullnhei@indust.bwl.univie.ac.at](mailto:bullnhei@indust.bwl.univie.ac.at)
- Richard F. Hartl; Univ. of Vienna, Inst. of MS, Bruenner Str. 72, Vienna, A-1210 , Austria;
- Christine Strauss; Univ. of Vienna, Inst. of MS, Bruenner Str. 72, Vienna, A-1210 , Austria;

Many decision problems in distribution management, a special field of production and operations management, can be formulated as (hard) combinatorial optimization problems, e.g., TSP, VRP, etc. Consequently, metaheuristics have a central importance in distribution management. We focus on the application of ant colony optimization to problems in distribution management.

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