

# Program overview

	Wednesday 14		Thursday 15			Friday 16	
8:30	Registration Opening session						
9:00	W1A Continous Location 22 36 50 52	W1B Covering Models 8 23 24 35	T1A Logistics and Transportation 3 5 9 13	T1B Location under Uncertainty 29 39 40 47	F1A Discrete Location 30 42 58 68	F1B Logistics and Transportation 44 62 69 71	
10:30	<i>Coffee break</i>						
11:00	Plenary talk <b>Paolo Toth</b>		Plenary talk <b>Janny Leung</b>			F2A Network Design 11 21 61 72	F2B Applications 17 37 53 67
12:00	W3A Competitive Location 19 43 65	W3B Covering Models 45 51 66	T3A Logistics and Transportation 16 27 28	T3B Applications 18 32 57	EWGLA session		
13:00	<i>Lunch</i>						
15:00	W4A Discrete Location 7 25 63	W4B Hub Location 1 6 34 56	T4A Network Design 2 31 38 48	T4B Other Problems 12 26 33 64			
16:30	<i>Coffee break</i>						
17:00	W5A Heuristics Approaches 14 20 41	W5B Hub Location 46 49 55	T5A Competitive Location 10 15 60	T5B Location under Uncertainty 4 59 70			
18:00	<i>City Tour</i>		Spanish Location Network				
20:00	Welcome reception		Gala dinner				

# Plenary talks

## Algorithms for Location-Routing Problems

**Paolo Toth**

We will consider the family of optimization problems including both “location” and “routing” aspects. In particular the *Capacitated m-Ring-Star Problem* (CmRSP) and the *Capacitated Location-Routing Problem* (CLRP) will be addressed.

In the *Capacitated Location-Routing Problem* (CLRP), the aim is to determine the depots to be opened, the customers to be assigned to each open depot, and the routes to be performed to fulfill the demand of the customers. The objective is to minimize the sum of the open depot cost, of the used vehicle cost, and of the traveling cost associated with the performed routes. The CLRP is NP-hard, since it generalizes two well-known NP-hard problems: the *Capacitated Facility Location Problem* (CFLP) and *Multi Depot Vehicle Routing Problem* (MDVRP).

In the *Capacitated m-Ring-Star Problem* (CmRSP) the aim is to find  $m$  “rings” (simple cycles) visiting a central depot, a subset of customers and a subset of potential (Steiner) nodes, while customers not belonging to any ring must be “allocated” to a visited (customer or Steiner) node. Moreover, the rings must be node-disjoint and the number of customers allocated or visited in a ring cannot be greater than a given capacity  $Q$ . The objective is to minimize the total visiting and allocation costs. The CmRSP is NP-hard, since it generalizes the Traveling Salesman Problem.

The most effective metaheuristic algorithms proposed for the solution of the CmRSP and of the CLRP will be described, and experimentally compared on the benchmark instances from the literature, by taking into account the CPU time and the quality of the solutions obtained.

## Humanitarian Logistics: Challenges, Models and Decision Support

**Janny Leung**

Recent natural and man-made disasters have highlighted the importance of effective logistics planning in and management for humanitarian relief. There are four phases of disaster management -- mitigation, preparedness, response and recovery – each with different focus and time-scale. Thus, different models and methods are needed for the different phases. In the immediate aftermath of a calamity, the agility for quick response may be most important, whereas for longer-term recovery cost-effectiveness might be the objective. This talk will survey the growing literature on operational research models and methods for humanitarian logistics. Some case studies will also be presented.

# Schedule

## Wednesday 14

09:00 - 10:30      W1A - Continous Location

Chair: Anita SCHÖBEL

MINLP Approaches for Minimum Spanning Trees with Neighborhoods **22**

*Victor Blanco, Elena Fernández and Justo Puerto*

(submission?id=22)

Equilibrium and optimum location problem of housings and jobs with constrained capacity **36**

*Yuki Munemasa, Yudai Honma and Kotaro Imai*

(submission?id=36)

The casualty collection points location problem in the plane **50**

*Mehdi Amiri-Aref*

(submission?id=50)

Planar location problems with uncertain demand points **52**

*Juan A. Mesa and Anita Schöbel*

(submission?id=52)

09:00 - 10:30 W1B - Covering Models

Chair: Ioannis GIANNIKOS

Multi Period Demand Covering Problems **8**

*Panagiota Sakellariou and Ioannis Giannikos*

(submission?id=8)

A Distance-Limited Continuous Location-Allocation Problem with Fixed Facility Costs **23**

*Kağan Gökbayrak and Ayşe Selin Kocaman*

(submission?id=23)

Locating Ambulances and their Bases Using Stochastic Programming **24**

*Melanie Reuter-Oppermann, Stefan Nickel and Francisco Saldanha-Da-Gama*

(submission?id=24)

Bi-Objective Optimization of Refugee Camps Water Distribution Network **35**

*Elif Akkaya, Özlem Karsu and Bahar Y. Kara*

(submission?id=35)

12:00 - 13:00 W3A - Competitive Location

Chair: Blas PELEGREN

Finding new routes to a destination for airline revenue maximization **19**

*Blas Pelegrín Pelegrín, Pascual Fernández Hernández and Juan Diego Pelegrín García*

(submission?id=19)

Discrete competitive location problems with different customer behavior and additional constraints **43**

*Pascual Fernández, Blas Pelegrin, Algirdas Lancinskas and Julius Zilinskas*  
(submission?id=43)

Environmental and economic efficiencies in a location optimization strategy **65**  
*Youcef Mechouar, Vincent Hovelaque and Carl Caigné*  
(submission?id=65)

12:00 - 13:00 W3B - Covering Models

Chair: Giuseppe BRUNO

Site Selection and Vehicle Routing for Post-disaster Needs Assessment Operations  
**45**

*Burcu Balcik, Duygu Pamukcu, Busra Uydasoglu and Ihsan Yanikoglu*  
(submission?id=45)

Location of Transfer Points on Cyclic Networks: The 2-transfer Additional Covering Problem **51**

*M. Cruz López-De-Los-Mozos, Juan A. Mesa and Anita Schöbel*  
(submission?id=51)

A multi-period mathematical programming model for the reorganization of regional transfusion systems. **66**

*Giuseppe Bruno, Antonio Diglio and Carmela Piccolo*  
(submission?id=66)

15:00 - 16:30 W4A - Discrete Location

Chair: Justo PUERTO

A fresh view on the Discrete Ordered Median Problem: New formulations and lower bounds **7**

*Justo Puerto and Diego Ponce*  
(submission?id=7)

Set formulations for the Monotone Ordered Median Problem **25**

*Martine Labb  , Diego Ponce and Justo Puerto*  
(submission?id=25)

Lagrange relaxation for the simple plant location problem with customers' preference orderings **63**

*Xavier Cabezas and Sergio Garc  a*  
(submission?id=63)

15:00 - 16:30 W4B - Hub Location

Chair: Rajan BATTA

Metaheuristic vs Reinforcement Learning Based Hyperheuristic applied to Capacitated Single Allocation p-Hub Location Problem **1**

*Kassem Danach, Shahin Gelareh, Wissam Khalil and Frederic Semet*  
(submission?id=1)

Heuristic Solutions for The Stochastic r-Allocation p-Hub Median Problem with Non-stop Services **6**

*Ángel Corberán, Rafael Martí, Juanjo Peiró and Francisco Saldanha-Da-Gama*  
(submission?id=6)

Adaptive Memory Programming for the Capacitated Modular Hub Location Problem  
**34**

*Arild Hoff, Juanjo Peiro, Angel Corberan and Rafael Marti*  
(submission?id=34)

Locating Depots to Facilitate Routing a Mixed Fleet of Electric and Conventional Vehicles **56**

*Nan Ding, Rajan Batta and Changhyun Kwon*  
(submission?id=56)

17:00 - 18:00      W5A - Heuristics Approaches

Chair: Laureano F. ESCUDERO

On solving large scale pure 0-1 QP problems for a class of dynamic facility location and customer assignment **14**

*Celeste Pizarro Romero and Laureano Escudero*  
(submission?id=14)

Solving the capacitated location-routing problem with an evolutionary algorithm  
**20**

*Rui Borges Lopes, Carlos Ferreira and Beatriz Sousa-Santos*  
(submission?id=20)

Facility Location with Supplier Selection under Quantity Discount **41**

*Görkem Emirhüseyinoğlu and Ali Ekici*  
(submission?id=41)

17:00 - 18:00      W5B - Hub Location

Chair: Sibel ALUMUR ALEV

Heuristics for Hub Location Problems with Congestion and Service Time **46**

*Sibel Alev Alumur, Stefan Nickel, Brita Rohrbeck and Francisco Saldanha-Da-Gama*  
(submission?id=46)

Threshold-based cost structures in hub location problems **49**

*Armin Lüer-Villagra, H.A. Eiselt and Vladimir Marianov*  
(submission?id=49)

A model and a metaheuristic method for the capacitated single allocation hub-

location-routing problem 55

Xiao Yang, Nathalie Bostel, Pierre Dejax and Marc Paquet

(submission?id=55)

## Thursday 15

09:00 - 10:30 T1A - Logistics and Transportation

Chair: Ángel CORBERÁN

Multi-period Capacitated Location-Allocation Model For a Company in the Food Sector 3

Necati Aras and Umit Bilge

(submission?id=3)

Cluster Lagrangean Decomposition in Multi-period Stochastic Facility Location-assignment Problems 5

María Araceli Garín, Laureano Escudero and Aitziber Unzueta

(submission?id=5)

The Chinese Postman Problem with Load-dependent Costs 9

Angel Corberan, Isaac Plana, José María Sanchis and Gilbert Laporte

(submission?id=9)

On risk management for a two-stage stochastic mixed 0-1 model for the design and operation planning of a closed-loop supply chain 13

Maria Isabel Gomes, Susana Baptista, Laureano F. Escudero and Celeste Pizarro

(submission?id=13)

09:00 - 10:30 T1B - Location under Uncertainty

Chair: Mercedes LANDETE RUIZ

A Bi-Objective Decision Making Framework for the Shelter Site Location Problem with Stochastic Demand 29

Ömer Burak Kınay, Bahar Yetiş Kara, Francisco Saldanha-Da-Gama and Isabel Correia

(submission?id=29)

Location of stations in a one-way electric car sharing system 39

Hatice Çalik and Bernard Fortz

(submission?id=39)

A non-dominated sorting hybrid algorithm for bi-objective reliability location problems 40

Javier Alcaraz, Mercedes Landete, Juan F. Monge and José L. Sainz-Pardo

(submission?id=40)

Analyzing the Impact of Capacity Volatility on the Design of a Supply Chain Network 47

12:00 - 13:00 T3A - Logistics and Transportation

Chair: Francisco A. ORTEGA RIEJOS

Improving Circulation Plans of Rolling Stock in Railway Networks by means of the Optimal Location of Depots 16

*Francisco A. Ortega, Eva Barrena and David Canca*  
(submission?id=16)

Locating Disaster Management Center and Routing Post-Disaster Assessment Teams 27

*Buse Eylül Oruç and Bahar Yetiş Kara*  
(submission?id=27)

An evolutionary algorithm for a biobjective school bus routing problem 28

*Herminia I. Calvete, Carmen Gale, José A. Iranzo and Paolo Toth*  
(submission?id=28)

12:00 - 13:00 T3B - Applications

Chair: Antonio Manuel RODRÍGUEZ CHÍA

On the use of DC optimization tools to visualize data 18

*Emilio Carrizosa, Vanesa Guerrero and Dolores Romero Morales*  
(submission?id=18)

Enhancements in Support Vector Machine with feature constraints 32

*Martine Labb  , Luisa I. Mart  nez-Merino and Antonio M. Rodr  guez-Ch  a*  
(submission?id=32)

Clustering data that are graph connected 57

*Stefano Benati, Justo Puerto and Antonio M. Rodriguez-Chia*  
(submission?id=57)

15:00 - 16:30 T4A - Network Design

Chair: Alfredo MAR  N

Location of switches in a spanning tree 2

*Mercedes Landete, Alfredo Mar  n and Jos   Luis S  inz-Pardo*  
(submission?id=2)

Organ Transplantation Logistics: A Case for Turkey 31

*Sinem Sava  r,   mer Burak K  nay, Pelin   y and Bahar Yet  s Kara*  
(submission?id=31)

A New Formulation and Valid inequalities for the Ring Spur Assignment Problem

*Shahin Gelareh, Bernard Fortz and Rahimeh Neamatian Monemi*  
 (submission?id=38)

Reliability Network Design for an Aircraft Door Management System **48**  
*Lukas Schaefer, Sergio Garcia and Vassili Srithammavanh*  
 (submission?id=48)

15:00 - 16:30 T4B - Other Problems

Chair: Maria ALBAREDA SAMBOLA

Dominance-Based Rough Set Approach for MultiObjective Facility Location  
 Problems **12**

*Maria Barbatì and Salvatore Greco*  
 (submission?id=12)

Phylogenetic tree space induced location problems **26**

*Marco Botte and Anita Schoebel*  
 (submission?id=26)

Re-organizing existing facility network with congestion problem – A systematic  
 review **33**

*Zati Aqmar Zaharudin, Andrea Genovese and Andrew Brint*  
 (submission?id=33)

The multi-depot VRP with vehicle interchanges **64**

*Victoria Rebillas-Loredo and Maria Albareda-Sambola*  
 (submission?id=64)

17:00 - 18:00 T5A - Competitive Location

Chair: James CAMPBELL

Omni-Channel Warehouse Location with Competition **10**

*James Campbell and Mitchell Millstein*  
 (submission?id=10)

A continuous competitive facility location model with attractiveness adjustment of  
 the existing facilities **15**

*José Fernández, Juani L. Redondo, Pilar M. Ortigosa and Boglárka G.-Tóth*  
 (submission?id=15)

Stackelberg location problem on networks with quality variables maximizing profit  
**60**

*Kristóf Kovács and Boglárka G.-Tóth*  
 (submission?id=60)

17:00 - 18:00 T5B - Location under Uncertainty

Chair: Laureano F. ESCUDERO

Endogenous time consistent risk averse multistage stochastic programming for management of natural disaster's effects mitigation **4**

*Laureano F. Escudero, M. Araceli Garin, Juan F. Monge and Aitziber Unzueta*  
(submission?id=4)

The p-Center Problem with Bernoulli demands **59**

*Maria Albareda-Sambola, Luisa I. Martínez-Merino and Antonio M. Rodríguez-Chía*  
(submission?id=59)

Rapid transit network design and risk aversion **70**

*Luis Cardoso, Esteve Codina, Laureano F. Escudero and Ángel Marín*  
(submission?id=70)

## Friday 16

09:00 - 10:30 F1A - Discrete Location

Chair: Stefan NICKEL

Sink Location - Best Possible Approximation Algorithms **30**

*Philipp Heßler*  
(submission?id=30)

MULTI-PERIOD MULTI-OBJECTIVE DISTRICTING OF PRIMARY HEALTH CARE SYSTEM **42**

*Seda Yanik, Joerg Kalcsics, Burcin Bozkaya and Stefan Nickel*  
(submission?id=42)

Locating logistic platforms in the context of city logistics **58**

*Nabil Absi, Daniel Boudouin, Dominique Feillet, Thierry Garaix and Olivier Guyon*  
(submission?id=58)

Supply Chain Design with Risk Consideration: CPLP-Risk **68**

*Iris Heckmann, Stefan Nickel and Francisco Saldanha-Da-Gama*  
(submission?id=68)

09:00 - 10:30 F1B - Logistics and Transportation

Chair: Olivier PETON

Inventory Slack Routing Problem for Medication Distribution Plan **44**

*Emre Cankaya*  
(submission?id=44)

Location of intermediate facilities in a two-echelon inventory-routing problem **62**

*Olivier Péton*  
(submission?id=62)

The 2-Depot 2-Vehicle Routing Problem **69**

*Bencomo Domínguez-Martín, Inmaculada Rodríguez-Martín and Juan-José Salazar-González*  
(submission?id=69)

Green Location Routing Problem **71**

*Okan Dukkanici, Bahar Y. Kara and Tolga Bektas*  
(submission?id=71)

11:00 - 12:00 F2A - Network Design

Chair: Antonio ALONSO-AYUSO

On the time-inconsistent and time consistent variations of the conditional value-at-risk measure for forestry planning under uncertainty in demands and prices **11**

*Antonio Alonso-Ayuso, Laureano Escudero, Monique Guignard-Spielberg and Andrés Weintraub*  
(submission?id=11)

Routing-location in wind farm design **21**

*Eligius Hendrix and Demetra Orthodoxou*  
(submission?id=21)

Least Cost Network Evaluation of Grid and Off-grid Electrification Systems **61**

*Gizem Bolukbasi and Ayse Selin Kocaman*  
(submission?id=61)

Integrated power expansion planning by considering reliability **72**

*Meltem Peker, Bahar Y. Kara and A. Selin Kocaman*  
(submission?id=72)

11:00 - 12:00 F2B - Applications

Chair: David CANCA

Application of process mining to the optimization of facility design in hospital units **17**

*Young Hoon Lee and Rismanchian Farhood*  
(submission?id=17)

Energy consumption optimization vs optimal timetables in railway rapid transit networks **37**

*Alejandro Zarzo, David Canca and Antonio Buendía*  
(submission?id=37)

A hub location-allocation model for wireless data transmission in public service networks **53**

*Pedro Luis González-R, David Canca and Marcos Calle*  
(submission?id=53)

A three-stage solution method for a milk blending collection problem with collection points **67**

*Germán Paredes-Belmar, Armin Lüer-Villagra, Vladimir Marianov, Cristián Cortés  
and Andrés Bronfman*  
(submission?id=67)