

XXI Latin Ibero-American Conference
on Operations Research

CLAIO 2022

December 12-15, 2022

Facultad de Ciencias Exactas y Naturales
Universidad de Buenos Aires
Buenos Aires, Argentina

Foreword

The Latin-Iberoamerican Conference on Operations Research takes place biennially since 1982 in different Latin American cities and is sponsored by the Association of Latin-Iberoamerican Operational Research Societies (ALIO). The main goals of this conference are to further the exchange of experiences, to establish and deepen ties between researchers and practitioners in the region, and to help young undergraduate and graduate students in their professional development.

The XXI edition of CLAIO takes place in Buenos Aires City, after the unfortunate cancellation of CLAIO 2020 due to the Covid pandemic. We are very happy to return to in-person conferences, and to host all of you in Buenos Aires!

This edition is special since it marks the 40th anniversary of the first CLAIO, which was held in Rio de Janeiro, Brazil, in 1982. In this edition we celebrate the contributions of Latin-American legends in OR, including Hugo Scolnik, Nelson Maculan, Jayme Szwarzfiter, and Andrés Weintraub. We are grateful for their work and their contributions to our discipline, and it is a honor for us to host them in CLAIO 2022.

CLAIO 2022 has received 446 abstracts and is hosting around 500 participants. The conference program includes six plenary talks, 80 sessions of contributed abstracts, and three special plenary sessions honoring legends of OR. It also hosts the “X Encuentro de la Red Iberoamericana de Evaluación y Decisión Multicriterio (RED-M)” and a special track on “OR in Health and Healthcare Services”. We gratefully acknowledge the authors of contributed abstracts, the session chairs, and the organizers of special sessions for making this conference possible.

On behalf of the program committee, the organizing committee, and the local committee, we hope that CLAIO 2022 is an inspiring and fruitful experience!

Guillermo Durán, Javier Marengo, and Paula Zabala
CLAIO 2022 co-chairs

CLAIO 2022 program committee

Victor Albornoz, Universidad Técnica Federico Santa María, Chile
Antonio Alonso-Ayuso, Universidad Rey Juan Carlos, Spain
Ana Barbosa-Povoa, Universidade Técnica de Lisboa, Portugal
Carlos Bouza, Universidad de La Habana, Cuba
Marta Cabo-Nodar, Instituto Tecnológico Autónomo de México, México
Hector Cancela, Universidad de la República, Uruguay
Emilio Carrizosa, Universidad de Sevilla, Spain
Alejandro Crema, Universidad Central de Venezuela, Venezuela
Marcia Fampa, Universidade Federal do Rio de Janeiro, Brazil
Elena Fernández, Universidad de Cádiz, Spain
Rosiane de Freitas, Universidade Federal do Amazonas, Brazil
Marcela González-Araya, Universidad de Talca, Chile
Isabel Gonzalez-Farias, Universidad de Piura, Perú
Irene Loiseau, Universidad de Buenos Aires, Argentina
Lorena Prádenas, Universidad de Concepción, Chile
Juan C. Rivera, Universidad EAFIT, Colombia
Luis M. Torres, Escuela Politécnica Nacional, Ecuador
Maria E. Urquhart, Universidad de la República, Uruguay
Ana Viana, INESC TEC, Portugal
Juan G. Villegas, Universidad de Antioquia, Colombia

CLAIO 2022 organizing committee

Guillermo Durán, Universidad de Buenos Aires, Argentina (co-chair)
Javier Marengo, Universidad de Buenos Aires + UNGS + UTDT, Argentina (co-chair)
Paula Zabala, Universidad de Buenos Aires, Argentina (co-chair)
Flavia Bonomo, Universidad de Buenos Aires, Argentina
Pablo Rey, Universidad Tecnológica Metropolitana, Chile

CLAIO 2022 local committee

Manuela Blaum, Universidad Nacional de General Sarmiento, Argentina
Mónica Braga, Universidad Nacional de General Sarmiento, Argentina
María Pía Mazzoleni, Universidad Nacional de La Plata, Argentina
Francisco Soullignac, Universidad de Buenos Aires, Argentina
Pablo Terlisky, Universidad de Buenos Aires, Argentina

CLAIO 2022 staff

Leila Abdala, Mercado Libre, Argentina
Federico Bertero, Findo, Argentina
Francisco Cirelli, Universidad de Buenos Aires, Argentina
Eitan Embon, Universidad de Buenos Aires, Argentina
Guido Freire, Universidad de Buenos Aires, Argentina
Axel Fridman, Universidad de Buenos Aires, Argentina
Micaela Hirsch, Universidad de Buenos Aires, Argentina
Juan Pablo Lebon, Universidad de Buenos Aires, Argentina
Giovanni Marraffini, Universidad de Buenos Aires, Argentina

Javier Martínez Viademonte, Universidad Nacional de General Sarmiento, Argentina
Santiago Montiel, Universidad Nacional de General Sarmiento, Argentina
Francisco Savariano, Universidad de Buenos Aires, Argentina
Lautaro Serpa Barberena, Universidad de Buenos Aires, Argentina
Amalia Sorondo, Universidad de Buenos Aires, Argentina
Agustín Venegas, Universidad de Buenos Aires, Argentina

Acknowledgements

The organizing committee wishes to thank all the people who made CLAIO 2022 possible. Special thanks go to the local committee and the CLAIO 2022 staff for their hard work. In particular, we are indebted to Francisco Soulignac and Pablo Terlisky for preparing the equipment for the parallel sessions, Mónica Braga and María Pía Mazzoleni for getting the deliverables, and Manuela Blaum for coordinating the logistics. We gratefully acknowledge the invaluable assistance of Alejo Seillant and Guido Roncaglia from Fundacen for organizing and carrying out the payment procedures. Special thanks go to María Soledad Suárez Mazzone for her assistance with the conference administration, and to Analía Barroso for her help with the conference logistics. We are grateful towards Guido Rodríguez Miguera, Omar Metallo, Guillermo Alfaro, Mateo Pinna, Miguel Acevedo, Nicolás Pistarino, Gustavo Cazenave, Mariel Arias, and all the staff from the university for their help with the rooms and the equipment. In particular, many thanks go to Mariana Delgado for coordinating the conference spaces, and to Jesica Guillin, Martín Escudero, Mariela Barrios, Hernán Peralta, Wilfredo Pulido, Nicole Ocampo, Leandro Ramírez, Daiana González, Daniel Benítez, Mariana Cipres, Nicolás Pelozo, Adriana Capdet, and Jonathan Morel for their outstanding work. We appreciate the help of Rodrigo González and Cristina Rodríguez with the software installations, and the help of Leonardo Zayat with the Internet connection in the conference venue. Many thanks to Karla Jaramillo, Soledad Arriagada, and Antonio Mauttone for their assistance with the printed matter, and to Armando Doria for his assistance with video recordings. We are indebted with the many people providing services for CLAIO 2022, including Sofía, Tamara, Cristina, Valentina, and Andrés from Cristal Palace Hotel, María Barreto and Laura Mena from Super A3, Yamila Martínez from GraboLaser, Federico Dekker from Creaciones Morena, Abril from VLZ SRL, Santiago Gutiérrez from the university cafeteria, Federico from La Copia, and Santiago Santolin Godoy for the recordings of the plenary sessions. Finally, many thanks to Norberto Marengo for the research that led to the magnets holding the signs in the doors, and a special acknowledgement to Juan Pablo Marengo and Gabriel Marengo for the logistics with the backpacks. Thank you all!

MANIFESTO

Since the 1940s, Science of Logistics has been always a cornerstone of Operational Research.

Since November 2019, our planet has been hit by the new coronavirus (COVID-19). This seriously challenges our societies, economies, healthcare systems, education and several other services and infrastructures, all around the globe. The uncertainty that has been introduced by this hit, has caused serious confusion and indecision in different parts of our societies and has affected our lifestyle.

Most authorities (states, regions, cities, etc.) have opted for and instructed various forms of lockdown and restrictions, promoting social distancing, remote working, shutting down non-essential services and several others, aiming at controlling the spread of the virus and managing the capacity of health care systems.

The imbalanced spatial distribution of various facilities, in many districts and neighborhoods, has caused access problem for citizens. Some citizens have walking distance access to facilities in order to fulfil their primary needs while for others, the use of public transport (which is also used for home-to-work commute of workers in essential service sectors) remains inevitable. The latter being a challenge to the precautionary measures of social distancing, thus increasing the risk of spread.

We are talking about facilities associated with health, food, policing, energy, telecommunications, garbage collections, equipment, and so on. While under these circumstances, demand for some non-essential services has drastically dropped down, there is a need to identify new policies aiming at introducing an adequate level of access to the essential services and facilities. This is particularly the case in those less developed suburbs and neighborhoods wherein new facilities shall be launched.

Sure enough, there are and will be serious social and societal problems, where Operational Research could act by presenting decision scenarios. Given the growth in the number of positive cases of COVID-19, decisions need to be made quickly, avoiding further casualties.

This is the time for all Operational Research societies and those interested in emergency logistics to approach and place themselves at the disposal of the mayors of their cities, governors of their regions and the top representative of their countries.

It is our obligation to be at the forefront in the fight against this pandemic.

Nelson Maculan

Former President of International Federation of Operational Research Societies
(IFORS, from 2013.01.01 to 2015.12.31)

Professor Emeritus, Federal University of Rio de Janeiro, Brazil

April 26, 2020

CLAIO 2022 – General Schedule

	Monday, December 12th
8:00	Registration desk is open
9:00	Parallel sessions
10:40	Coffee break
11:10	Opening + Plenary talk: Mario Martínez
12:10	Lunch time
14:00	Parallel sessions
15:40	Coffee break
16:10	Celebrating Andrés Weintraub and Hugo Scolnik
17:10	Mini-break
17:20	Celebrating Jayme Szwarcfiter and Nelson Maculan
18:20	Mini-break
18:30	Panel: From CLAIO 1982 to the future, history and perspectives of OR in Latin America
20:00	

	Tuesday, December 13th	Wednesday, December 14th
9:00	Parallel sessions	Parallel sessions
10:40	Coffee break	Coffee break
11:10	Plenary talk: Anna Nagurney	Plenary talk: Emma Hart
12:10	Mini-break	Mini-break
12:30	Parallel sessions	Parallel sessions
14:10	Assembly of ALIO representatives	
15:30		

	Thursday, December 15th
9:00	Parallel sessions
10:40	Coffee break
11:10	Plenary talk: Antonio Alonso-Ayuso
12:10	Lunch time
14:00	Parallel sessions
15:40	Mini-break
16:00	Plenary talk: Valentina Gutiérrez
17:00	Coffee break
17:30	Plenary talk: Shipping OR Team
18:30	Closing ceremony
18:45	

CLAIO 2022 – Parallel sessions

Monday, December 12th – 9:00

1101 RED-M
1208 Network design
1209 OR in Healthcare I
1301 VRP I
1302 Stochastic optimization I
1303 Combinatorial optimization I
1304 Algorithms I
1305 Applications of OR I
1306 Machine Learning and DEA
1307 OR in Energy I
1309 Honoring Jayme Swarcfiter I

Tuesday, December 13th – 9:00

1101 RED-M
1208 Stochastic optimization II
1209 OR in Economy II
1301 OR in Energy III
1302 VRP III
1303 OR and statistics I
1304 OR in Healthcare II
1305 Inventory and supply chain
1306 Machine Learning I
1307 Applications of OR II
1308 Mixed Integer Programming I
1309 Honoring Nelson Maculan I

Wednesday, December 14th – 9:00

1101 RED-M
1208 RSA I
1209 Honoring Jayme Swarcfiter III
1301 OR in Agriculture II
1302 Logistics II
1303 Applications of OR IV
1304 Algorithms III
1305 Honoring Nelson Maculan III
1306 General aspects of OR I
1307 VRP IV
1309 Honoring Andrés Weintraub

Thursday, December 15th – 9:00

1101 RED-M
1208 DEA
1209 Facility location
1301 OR in Energy V
1302 TSP
1303 Metaheuristics
1304 OR in Economy III
1305 Rostering and applications
1306 Simulation II
1307 Column generation
1308 Combinatorial optimization II
1309 Special track: OR in Health I

Monday, December 12th – 14:00

1101 RED-M
1208 OR in Energy II
1209 Scheduling I
1301 Simulation I
1302 VRP II
1303 Agriculture and Machine Learning
1304 Forestry
1305 Logistics I
1306 Timetabling
1307 Nonlinear optimization
1308 OR in Economy I
1309 Multi-criteria optimization

Tuesday, December 13th – 12:30

1101 RED-M
1208 Supply chain optimization I
1209 Machine Learning II
1301 Lot sizing
1302 OR in Energy IV
1303 Algorithms II
1304 OR in Agriculture I
1305 OR for COVID-19
1306 Honoring Nelson Maculan II
1307 Applications of OR III
1309 Honoring Jayme Swarcfiter II

Wednesday, December 14th – 12:30

1101 RED-M
1208 RSA II
1209 General aspects of OR II
1301 Logistics III
1302 Graph theory
1303 Applications of OR IV
1304 Supply chain optimization II
1305 Queueing and metaheuristics
1306 OR and the environment I
1307 Stochastic optimization III
1308 Planning and urban planning
1309 OR and statistics II

Thursday, December 15th – 14:00

1101 OR through AI
1208 OR and sustainability
1209 OR in Energy VI
1301 Scheduling II
1302 OR and the environment II
1303 Game theory
1304 Logistics IV
1305 Combinatorial optimization III
1306 Machine Learning III
1307 Mixed Integer Programming II
1309 Special track: OR in Health II

CLAIO 2022 - Sessions summary

Dec 12	09:00	1101	Ibero-American Network on Multicriteria Evaluation and Decision
		1208	Network design
		1209	OR in Healthcare I
		1301	VRP I
		1302	Stochastic optimization I
		1303	Combinatorial optimization I
		1304	Algorithms I
		1305	Applications of OR I
		1306	Machine Learning and DEA
		1307	OR in Energy I
		1309	Special session honoring Jayme Szwarcfiter I
Dec 12	11:10	Aula Magna	Opening ceremony + Plenary session - "CRIAB: Conflicts, risks and impacts associated with dams", Mario Martínez, Universidade Estadual de Campinas, Brazil
Dec 12	14:00	1101	Ibero-American Network on Multicriteria Evaluation and Decision
		1208	OR in Energy II
		1209	Scheduling I
		1301	Simulation I
		1302	VRP II
		1303	Agriculture and Machine Learning
		1304	Forestry
		1305	Logistics I
		1306	Timetabling
		1307	Nonlinear optimization
		1308	OR in Economy I
		1309	Multi-criteria optimization
Dec 12	16:10	Aula Magna	Plenary session - Legends of OR I: Celebrating Andrés Weintraub and Hugo Scolnik
Dec 12	17:20	Aula Magna	Plenary session - Legends of OR II: Celebrating Jayme Szwarcfiter and Nelson Maculan
Dec 12	18:30	Aula Magna	Plenary session - Legends of OR III: From CLAIO 1982 to the future. History and perspectives of OR in Latin America

CLAIO 2022 - Sessions summary

Dec 13	09:00	1101	Ibero-American Network on Multicriteria Evaluation and Decision
		1208	Stochastic optimization II
		1209	OR in Economy II
		1301	OR in Energy III
		1302	VRP III
		1303	OR and statistics I
		1304	OR in Healthcare II
		1305	Inventory and supply chain optimization
		1306	Machine Learning I
		1307	Applications of OR II
		1308	Mixed Integer Programming I
		1309	Special session honoring Nelson Maculan I

Dec 13	11:10	Aula Magna	Plenary session - "Human migration networks: How Operations Research can assist with refugees and supply chain labor shortages," Anna Nagurney (IFORS Distinguished Lecturer), University of Massachusetts, USA
--------	-------	------------	--

Dec 13	12:30	1101	Ibero-American Network on Multicriteria Evaluation and Decision
		1208	Supply chain optimization I
		1209	Machine Learning II
		1301	Lot sizing
		1302	OR in Energy IV
		1303	Algorithms II
		1304	OR in Agriculture I
		1305	OR for COVID-19
		1306	Special session honoring Nelson Maculan II
		1307	Applications of OR III
		1309	Special session honoring Jayme Szwarcfiter II

CLAIO 2022 - Sessions summary

Dec 14	09:00	1101	Ibero-American Network on Multicriteria Evaluation and Decision
		1208	Routing and Spectrum Allocation I
		1209	Special session honoring Jayme Szwarcfiter III
		1301	OR in Agriculture II
		1302	Logistics II
		1303	Applications of OR IV
		1304	Algorithms III
		1305	Special session honoring Nelson Maculan III
		1306	General aspects of OR I
		1307	VRP IV
		1309	Special session honoring Andrés Weintraub

Dec 14	11:10	Aula Magna	Plenary session - "'Keep on Learning': towards the development of optimisers that continually adapt", Emma Hart (EURO Distinguished Lecturer), Edinburgh Napier University
--------	-------	---------------	---

Dec 14	12:30	1101	Ibero-American Network on Multicriteria Evaluation and Decision
		1208	Routing and Spectrum Allocation II
		1209	General aspects of OR II
		1301	Logistics III
		1302	Graph theory and combinatorial optimization
		1303	Applications of OR V
		1304	Supply chain optimization II
		1305	Queueing theory and metaheuristics
		1306	OR and the environment I
		1307	Stochastic optimization III
		1308	Planning and urban planning
		1309	OR and statistics II

CLAIO 2022 - Sessions summary

Dec 15	09:00	1101	Ibero-American Network on Multicriteria Evaluation and Decision
		1208	DEA
		1209	Facility location
		1301	OR in Energy V
		1302	TSP
		1303	Metaheuristics
		1304	OR in Economy III
		1305	Rostering and applications
		1306	Simulation II
		1307	Column generation
		1308	Combinatorial optimization II
		1309	Special track: OR in Health and Healthcare Services I
Dec 15	11:10	Aula Magna	Plenary session - "Applied mathematical optimization: success stories in logistics and planning", Antonio Alonso-Ayuso, Universidad Rey Juan Carlos, Spain
Dec 15	14:00	1101	Democratization of OR through Artificial Intelligence
		1208	OR and sustainability
		1209	OR in Energy VI
		1301	Scheduling II
		1302	OR and the environment II
		1303	Game theory
		1304	Logistics IV
		1305	Combinatorial optimization III
		1306	Machine Learning III
		1307	Mixed Integer Programming II
		1309	Special track: OR in Health and Healthcare Services II
Dec 15	16:00	Aula Magna	Plenary session - "OR in Healthcare in Latin Ibero-America: Developments and research perspectives", Valentina Gutiérrez, Universidad del Valle, Colombia
Dec 15	17:30	Aula Magna	Plenary session - "A stochastic programming approach for the operational fleet composition problem", Ramon Faganello Fachini and Camila Fernanda Contreras, Shipping OR Team, Mercado Libre, Argentina + Brazil + Chile
Dec 15	18:30	Aula Magna	Closing ceremony

CLAIO 2022

XXI Latin-Iberoamerican Conference on Operations Research

Buenos Aires, Argentina - December 12-15, 2022

Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires

CLAIO 2022 detailed program

Parallel session - Ibero-American Network on Multicriteria Evaluation and Decision (RED-M)

December 12, 2022 (Monday), 09:00 - 10:40 - Room 1101

Chair: Javier Pereira

- 09:00** Claudia Peretto, Leticia Tolosa, Tomas Barbaroy, María Gracia Frascaroli, Selección de una cartera de inversión utilizando el método ELECTRE III
 - 09:25** Eduar Fernando Aguirre Gonzalez, Pablo Cesar Manyoma Velasquez, Diego Fernando Manotas Duque, Prioritization of FICs taking into account multiple criteria for the construction of efficient portfolios
 - 09:50** Javier Pereira, Elaine Oliveira, Danielle Morais, Luciana Alencar, Ana Paula Costa, Multi-criteria hesitant sorting of projects in a brazilian electrical power company
 - 10:15** Camila Campos Gómez Famá, Luciana Hazin Alencar, Joseph Hakkinen Alves Santos, Management team classification by competencies: A case study in the civil construction sector
-

Parallel session - Network design

December 12, 2022 (Monday), 09:00 - 10:15 - Room 1208

Chair: María de los Milagros Verrengia

- 09:00** Javier Arias-Osorio, Carlos Poches, Natalia Tarazona, Diseño de una red de distribución a través de un modelo de localización e inventario multiescalón con múltiples productos, múltiples periodos y tiempos de entrega definidos en la red.
 - 09:25** Pablo Torrealba-Gonzalez, German Paredes-Belmar, Gabriel Gutiérrez-Jarpa, Elevators and bikeways network design problem considering the preference of users
 - 09:50** Milagros Verrengia, Aldo Vecchiatti, An analysis of Argentine's railway infrastructure in the soybean supply chain operation
-

CLAIO 2022 detailed program

Parallel session - OR in Healthcare I

December 12, 2022 (Monday), 09:00 - 10:40 - Room 1209

Chair: Fernanda Suazo Morales

- 09:00** Daniela Cantane, Juliana Freitas, Helenice Florentino Silva, Thalita Obal, Comparison of radiotherapy planning optimization models including dose-volume constraints
- 09:25** Camilo Velez, Doris Campo, Lilian Sepulveda, Análisis de estrategias para el control del patosistema Diaphorina citri - HLB
- 09:50** Doris Campo, Lilian Sepulveda, Modelo matemático para el manejo óptimo del Psílido Diaphorina Citri
- 10:15** Fernanda Suazo-Morales, Óscar C. Vásquez, Modelo matemático para estimar la distribución del índice de masa corporal (IMC) en la población adulta chilena.
-

Parallel session - VRP I

December 12, 2022 (Monday), 09:00 - 10:40 - Room 1301

Chair: Pablo Rey

- 09:00** Juan G. Villegas R., Juan Carlos Rivera, Periodic vehicle routing with consistency and synchronization constraints: formulation and solution methods
- 09:25** Maddlen Benedicto Villagra Aguayo, Carlos Obreque Níñez, Guillermo Latorre Níñez, Patricio Álvarez Mendoza, Barrales Araneda Alex, Carlos Bizama Fica, El problema del ruteo de furgones escolares selectivo, con carga mixta, flota heterogénea y ventanas de tiempo
- 09:50** Carlos Obreque, Guillermo Latorre-Núñez, Patricio Álvarez, Alex Barrales, Carlos Bizama, Maddlen Benedicto Villagra Aguayo, Ruteo de furgones escolares selectivo, con carga mixta, flota homogénea y transbordo
- 10:15** Luis Yáñez-Sandivari, Cristián Cortés, Pablo Rey, Optimizing vehicle routing problems with material convergence and deprivation costs in multi-dimensional representation network
-

Parallel session - Stochastic optimization I

December 12, 2022 (Monday), 09:00 - 10:40 - Room 1302

Chair: Alejandro Mac Cawley

- 09:00** Juan Borrero, Denis Sauré, Natalia Trigo, Optimal sequential stochastic shortest path interdiction
- 09:25** Luis San Martin, Jorge Vera, Capability design for a modular block-based organization via robust optimization
- 09:50** José Emmanuel Gomez-Rocha, Eva Selene Hernández-Gress, A multi-product aggregate production planning using stochastic programming: case study in a furniture company
- 10:15** Alejandro Milani, Alejandro Mac Cawley, Analyzing the impact of beliefs errors in the planning of wine grape harvesting operations
-

CLAIO 2022 detailed program

Parallel session - Combinatorial optimization I

December 12, 2022 (Monday), 09:00 - 10:40 - Room 1303

Chair: John Andrés Muñoz Guevara

- 09:00** Alberto de Paula Silva, Mercedes Bustos Díaz, Proposal of a model for optimizing the project portfolio of the Brazilian National Institute for Space Research
- 09:25** Gabriel Solari, Review and contribution in the MTZ formulation for the Traveling Salesman Problem
- 09:50** Karen García-Vásquez, Carlos Contreras-Bolton, Rodrigo Linfati, Un Modelo matemático y una metaheurística para una nueva variante del Pollution Traveling Salesman Problem
- 10:15** John Andres Muñoz Guevara, Exact models for a robotics assembly cell scheduling problem to minimize tardiness

Parallel session - Algorithms I

December 12, 2022 (Monday), 09:00 - 10:40 - Room 1304

Chair: Amanda Ferreira de Azevedo

- 09:00** Daniel Mauricio Ocampo-Giraldo, Ana Maria Anaya-Arenas, Claudio Contardo, A dynamic discretization discovery algorithm for the routing of multiple and highly perishable commodities: an application to the transportation of biomedical samples
- 09:25** Simon B. Hengeveld, Antonio Mucherino, An error-tolerant branch-and-prune algorithm for distance geometry
- 09:50** Michal Cerny, Robust linear regression and minimization of Jaeckel's dispersion via the ellipsoid method with oracles
- 10:15** Amanda Ferreira de Azevedo, Victor Hugo Rodrigues Do Nascimento, Abilio Pereira de Lucena Filho, An uncapacitated facility location approach for finding optimal diameter constrained minimum spanning trees with diameter no larger than four

Parallel session - Applications of OR I

December 12, 2022 (Monday), 09:00 - 10:40 - Room 1305

Chair: Josué Salinas

- 09:00** Fabio M. Miguel, Diego G. Rossit, Mariano Frutos, Antonella Cavallin, An application of data mining to build the OD matrix in developing countries: An Argentinean case study
 - 09:25** Gian Franco Lancioni, Guillermo Duran, Statistical modelling of tennis results prediction
 - 09:50** Richard Weber, Ignacio Carvajal, Fernando Crespo, Ramiro Saltos, A new validity index for dynamic clustering
 - 10:15** Josué Salinas, Jaime Miranda, Sistema de apoyo a la toma de decisiones para el pronóstico de rating televisivo
-

CLAIO 2022 detailed program

Parallel session - Machine Learning and DEA

December 12, 2022 (Monday), 09:00 - 10:15 - Room 1306

Chair: Livia Mariana Lopes de Souza Torres

- 09:00** Sebastián Maldonado, Catalina Sánchez, Carla Vairetti, Modelos predictivos de cobranza basados en aprendizaje de máquinas tradicional y causal
- 09:25** Tatiana Andrea Castillo Jaimes, Andres Weintraub, Jaime Carrasco, Diseño de paisajes resistentes a incendios usando Reinforcement Learning
- 09:50** Livia Mariana Lopes de Torres, Francisco de Sousa Ramos, A common weight multi-layer DEA composite indicator to assess the quality of undergraduate courses in Brazil

Parallel session - OR in Energy I

December 12, 2022 (Monday), 09:00 - 10:15 - Room 1307

Chair: Larraitz Aranburu Laka

- 09:00** Sebastián Taboh, Isabel Mendez-Diaz, Paula Zabala, Intelligent exploration of a backtracking algorithm for scheduling residential load
- 09:25** Alexandra Valencia, Yris Olaya, Santiago Arango, Simulación de los efectos de la penetración de tecnologías renovables no convencionales en la seguridad energética en Colombia
- 09:50** Larraitz Aranburu, Aitziber Unzueta, M. Araceli Garín, Juan I. Modroño, Aitor Amezua, Técnicas de análisis y optimización para la identificación de línea en las redes de distribución inteligentes mediante datos metrológicos

Parallel session - Special session honoring Jayme Szwarcfiter I

December 12, 2022 (Monday), 09:00 - 10:40 - Room 1309

Chair: Rosiane de Freitas

- 09:00** Celina Figueiredo, Alexsander Melo, Fabiano Oliveira, Ana Silva, MaxCut is hard when restricted to geometric intersection model graph classes
 - 09:25** Erika Morais Martins Coelho, Hebert Coelho Da Silva, Luerbio Faria, Mateus de Paula Ferreira, Sulamita Klein, The time complexity of oriented chromatic number for subgraphs of grids
 - 09:50** Rosiane de Freitas, Contributions in channel assignment and distance geometry with Nelson Maculan
 - 10:15** Rosiane de Freitas, Contributions in scheduling theory and distance-constrained graph colorings with Jayme Szwarcfiter
-

CLAIO 2022 detailed program

Opening ceremony + Plenary session - "CRIAB: Conflicts, risks and impacts associated with dams", Mario Martinez, Universidade Estadual de Campinas, Brazil

December 12, 2022 (Monday), 11:10 - Aula Magna

Chair: Pablo Rey

The CRIAB working group was created in 2019 as a result of the disaster in Brumadinho, Minas Gerais, where a tailings dam collapsed causing huge human and material losses. Since then, the group has been working in an interdisciplinary context on risk assessment, environmental remediation, support to affected populations and hydraulic modeling. In this talk we will transmit the experiences of the Mathematical Engineering subgroup in the development of models, with emphasis on appropriate numerical analysis and optimization tools.

The talk will be given in Spanish, with slides in English.

Parallel session - Ibero-American Network on Multicriteria Evaluation and Decision (RED-M) - Talk: " Métodos de Estruturação de Problemas para Modelos Multicritério de Apoio à Decisão", Mischel Carmen Neyra Belderrain, Instituto Tecnológico de Aeronáutica - ITA, Brasil

December 12, 2022 (Monday), 14:00 - Room 1101

Chair: Luciana Alencar

Parallel session - OR in Energy II

December 12, 2022 (Monday), 14:00 - 15:40 - Room 1208

Chair: Santiago Arango-Aramburo

- | | |
|--------------|---|
| 14:00 | Rafael Benchimol Klausner, Bernardo Freitas Paulo da Costa, Joaquim Dias Garcia, Optimal bidding strategies in Energy Markets |
| 14:25 | Tito Homem-De-Mello, Frédéric Babonneau, Constanza Zavala, Impact of climate change on long-term energy generation and demand in Chile |
| 14:50 | Francisco Gasparin Fabrin, Daniel Pinheiro Bernardon, Vinícius Jacques Garcia, Alexandre Pose, Sebastian Butto, Lucas Melo de Chiara, Daiana Wichmann da Silva, On the analysis of contract optimization for high seasonal electrical consumers |
| 15:15 | Santiago Arango-Aramburo, Yris Olaya, Verónica Valencia, The role of alternative combustion vehicles and the modal changes on the path to decarbonizing road transport |
-

CLAIO 2022 detailed program

Parallel session - Scheduling I

December 12, 2022 (Monday), 14:00 - 15:40 - Room 1209

Chair: Juan Pablo Rosas Baldazo

- 14:00** Matias Villafranca, Felipe Delgado, Mathias Klapp, A stochastic programming approach for airline maintenance scheduling under uncertainty
- 14:25** Joan Cusimano, Romina Alejandra Ríos, Fernando Herrero, Emilce Faba, Pablo Andrés Marchetti, Formulación MILP y aplicación de algoritmo de horizonte rodante para la Programación Maestra de la Producción en una industria de alimentos para mascotas
- 14:50** Joaquin Velázquez, Héctor Cancela, Pedro Piñeyro, Planificación de la producción con máquinas paralelas multi-producto, recursos compartidos y tiempos de configuración dependientes de la secuencia
- 15:15** Pablo Rosas, Yasmin Rios-Solis, Romeo Sánchez Nigenda, A personalized activity scheduling problem considering stress, deadlines, and teamwork

Parallel session - Simulation I

December 12, 2022 (Monday), 14:00 - 15:40 - Room 1301

Chair: Pepa Ramirez Cobo

- 14:00** Rodrigo Mahaluf, Jaime Carrasco, Fulgencio Lisón, Cristobal Pais, Andrés Weintraub, Combining optimization and fire simulation modeling to protect ecological values at landscape scale
- 14:25** Gabriela Alfaro, Jaime Carrasco, Andres Weintraub, Alejandro Miranda, Cristobal Pais, Riesgo de incendios forestales en el interfaz urbano rural de Concepción, usando machine learning y simulación espacial
- 14:50** M. Elena Martínez-Manzanares, J. Adolfo Minjárez-Sosa, Mean field semi-Markov control models for interacting objects systems under a discounted optimality criterion
- 15:15** Pepa Ramirez Cobo, Rosa Lillo, Marcos Gonzalez Bernal, Stochastic modeling of modern call center data via Markovian arrival processes

Parallel session - VRP II

December 12, 2022 (Monday), 14:00 - 15:40 - Room 1302

Chair: Laura Davila-Pena

- 14:00** Hernán Lespay, Karol Suchan, Territory design for Multi-Period Vehicle Routing Problem with Time Windows
 - 14:25** Igor E. S. Melo, Raphael Kramer, A heuristic algorithm for solving the school bus routing problem with multiple periods
 - 14:50** Cristian G Gómez-Marín, Conrado A Serna-Uran, A multi-agent architecture for solving the dynamic vehicle routing problem with time windows
 - 15:15** Laura Davila Pena, David Rodríguez Penas, Balbina Casas Méndez, Maria Antónia Carravilla, José Fernando Oliveira, Two-phase heuristics for the novel multi-compartment truck and trailer routing problem
-

CLAIO 2022 detailed program

Parallel session - Agriculture and Machine Learning

December 12, 2022 (Monday), 14:00 - 15:40 - Room 1303

Chair: Víctor Manuel Albornoz Sanhueza

- 14:00** Víctor Bucarey, Decision-focused learning under the lens of bilevel programming
- 14:25** Nicolás Reyes-Reyes, Marcela González-Araya, Wladimir Soto-Silva, Javier Gómez-Lagos, Irlanda Ceballos-Fuentealba, Identificación de variedad y etapas de crecimiento en cultivos mediante redes neuronales y descriptores de características: Un caso aplicado en un cultivo de lechugas en Chile
- 14:50** Irlanda Ceballos-Fuentealba, Javier Gómez-Lagos, Marcela González-Araya, Wladimir Soto-Silva, Nicolás Reyes-Reyes, Un enfoque de machine learning para la estimación de pérdida hortícola: un caso aplicado en un cultivo de lechugas en Chile
- 15:15** Victor M Albornoz, Patricio I Vera, Lia C Araneda, A two-stage stochastic bilevel program for coordinating a hierarchical fresh food supply chain

Parallel session - Forestry

December 12, 2022 (Monday), 14:00 - 15:40 - Room 1304

Chair: Daniel Rossit

- 14:00** Frank Piedra-Jimenez, Diego Broz, Juan M. Novas, Maria Analia Rodriguez, A multi-objective mathematical optimization approach for the forest planning problem
- 14:25** David Palacios, Jaime Carrasco, Sebastián Dávila, Cristobal Pais, Maximiliano Martínez, Andrés Weintraub, Comparison of metaheuristics for the optimization of the firebreak allocation in real landscapes
- 14:50** Karina López, Victor Viana, Pedro Piñeyro, Optimización de las operaciones forestales con consideraciones medioambientales: una aplicación a un aserradero de Uruguay
- 15:15** Daniel Rossit, Diego Broz, Cristóbal Pais, Andrés Weintraub, Forestry harvest planning considering social impacts and soil compaction issues

Parallel session - Logistics I

December 12, 2022 (Monday), 14:00 - 15:15 - Room 1305

Chair: Luis Marcelo Ascencio Carreño

- 14:00** Rajan Batta, Nastaran Oladzad-Abbasabady, Using prize-collection concepts to solve time-limited search problems: Application to humanitarian operations
 - 14:25** Mahsa Hosseini, Joseph Milner, Gonzalo Romero, Dynamic relocations in car-sharing networks
 - 14:50** Macarena Vergara, Felipe I. Díaz, Luis M. Ascencio, Sergio Cruz, Rosa G. Gonzalez Ramirez, J. René Villalobos, Metodología basada en Costos Logísticos Totales para el análisis estratégico del Corredor Bioceánico Capricornio y su impacto en los puertos del norte de Chile
-

CLAIO 2022 detailed program

Parallel session - Timetabling

December 12, 2022 (Monday), 14:00 - 15:15 - Room 1306

Chair: Julián Andrés Osorio Vergara

- 14:00** Jaime Miranda, A analytical approach for infrastructure capacity planning in higher education
- 14:25** Jainet Bernal, Valentina Rodríguez, Catalina Martínez, Modelo matemático para nivelar la carga estudiantil, en las distintas franjas horarias de IES, y favorecer el distanciamiento social; caso de estudio, Universidad Central en Bogotá Colombia
- 14:50** Julian Osorio, Mauricio Cepeda, Jainet Bernal, Asignación de árbitros en campeonatos de fútbol multisede usando un modelo de optimización multiobjetivo. Caso de estudio Copa América

Parallel session - Nonlinear optimization

December 12, 2022 (Monday), 14:00 - 15:40 - Room 1307

Chair: Jan-Joachim Rückmann

- 14:00** Silvia Maria Simões de Carvalho, Aurelio Oliveira, Application of the Quasi-Newton in interior point methods for solving the predispatch problem
- 14:25** Renan W. Prado, Sandra A. Santos, Lucas E. A. Simões, On the achievement of the complementary approximate Karush-Kuhn-Tucker conditions and algorithmic applications
- 14:50** Marko Rojas-Medar, Lucelina dos Santos, Adson Melo, María Beatriz Hernández-Jiménez, Nonregular multiobjective problems: Necessary and sufficient optimality conditions
- 15:15** Jan-J. Ruckmann, Daniel Hernandez Escobar, On strong stability of C-stationary points for MPCC

Parallel session - OR in Economy I

December 12, 2022 (Monday), 14:00 - 15:40 - Room 1308

Chair: Jonathan Lozano Oviedo

- 14:00** Xavier Brusset, Hussein Naseraldin, Aseem Kinra, Rami Alkhudary, Increasing willingness to pay in the food supply chain: a Blockchain approach
 - 14:25** André Salles, Dayana Alves, Performance of risk and return on ESG financial assets in international markets: A preliminary analysis
 - 14:50** Fabien Gensbittel, Dana Maria Pizarro, Jerome Renault, Competition and recall in selection problems
 - 15:15** Jonathan Lozano Oviedo, Cristian Cortés Carrillo, Pablo Andres Rey, Modelo de optimización multiobjetivo para un caso genérico de una cadena de suministro de bucle cerrado considerando elementos de sostenibilidad y economía circular
-

CLAIO 2022 detailed program

Parallel session - Multi-criteria optimization

December 12, 2022 (Monday), 14:00 - 15:40 - Room 1309

Chair: Douglas Alem

- 14:00** Armando Meza, Juan Pérez, Héctor López-Ospina, Luís Quezada, Development of strategic map (BSC) with fuzzy logic and multi-criteria optimization
- 14:25** Mauricio Moyano, Carolina Lagos, Guillermo Cabrera-Guerrero, Pareto local search for direct aperture optimisation on IMRT
- 14:50** Letícia Maria de Melo Silva Cheloni, Rodrigo de Carvalho, André L. Maravilha, Érica Linhares Reis, A multi-objective algorithm based on decomposition for optimal design Manganese briquettes
- 15:15** Douglas Alem, Aakil Caunhye, Equitable location-allocation driven by socioeconomic concerns

Plenary session - Legends of OR I: Celebrating Andrés Weintraub and Hugo Scolnik

December 12, 2022 (Monday), 16:10 - Aula Magna

Chair: Isabel Méndez-Díaz

In this session we will be honoring Andrés Weintraub (Universidad de Chile, Chile) and Hugo Scolnik (Universidad de Buenos Aires, Argentina) for their lifelong achievements and their contributions to shaping the OR community in Latin America. Rafael Epstein (Universidad de Chile, Chile) will give a talk on the academic life of Andrés Weintraub, whereas José Mario Martínez (Universidade Estadual de Campinas, Brazil) will give a talk on Hugo Scolnik's achievements. On behalf of the Latin-Iberoamerican Association of Operations Research Societies (ALIO), Antonio Alonso-Ayuso will present Andrés Weintraub and Hugo Scolnik a special award.

Plenary session - Legends of OR II: Celebrating Jayme Szwarcfiter and Nelson Maculan

December 12, 2022 (Monday), 17:20 - Aula Magna

Chair: Isabel Méndez-Díaz

In this session we will be honoring Jayme Szwarcfiter (Universidade Federal do Rio de Janeiro, Brazil) and Nelson Maculan (Universidade Federal do Rio de Janeiro, Brazil) for their outstanding academic careers and their pioneering work in graph theory and OR, respectively, in our region and in Brazil in particular. Celina de Figueiredo (Universidade Federal do Rio de Janeiro, Brazil) will give a presentation on Jayme Szwarcfiter, and Rosiane de Freitas (Universidade Federal do Amazonas, Brazil) will give a talk on Nelson Maculan, on behalf of their respective academic families. Antonio Alonso-Ayuso, president of ALIO, will present Jayme Szwarcfiter and Nelson Maculan a special award from ALIO.

CLAIO 2022 detailed program

Plenary session - Legends of OR III: From CLAIO 1982 to the future. History and perspectives of OR in Latin America

December 12, 2022 (Monday), 18:30 - Aula Magna

Chair: Isabel Méndez-Díaz

In this panel, our special guests Andrés Weintraub (Universidad de Chile, Chile), Hugo Scolnik (Universidad de Buenos Aires, Argentina), Nelson Maculan (Universidade Federal do Rio de Janeiro, Brazil), and Jayme Szwarcfiter ((Universidade Federal do Rio de Janeiro, Brazil) will reflect on the origins of OR in Latin America, the origin of the Latin-Iberoamerican Association of Operations Research Societies (ALIO), and the current status and future perspectives of our field.

CLAIO 2022 detailed program

Parallel session - Ibero-American Network on Multicriteria Evaluation and Decision (RED-M) - Minicourse: "Método FITRADEOFF (The Flexible and Interactive Tradeoff)", Luciana Alencar, Maria Elvira Pessoa, Eduarda Asfora Frej, Universidade Federal de Pernambuco, Brazil

December 13, 2022 (Tuesday), 09:00 - Room 1101

Chair: Luciana Hazim

Parallel session - Stochastic optimization II

December 13, 2022 (Tuesday), 09:00 - 10:40 - Room 1208

Chair: Carlos Ernani Fries

- 09:00** Enrique Fernández, Javier Marenco, Heuristic algorithms for a stochastic optimization problem in production and distribution planning
 - 09:25** Douglas Nascimento, Adriana Cherri, José Oliveira, Beatriz Oliveira, Stochastic model for the two-dimensional cutting stock problem: usable leftovers and uncertainty in demand
 - 09:50** Iago Leal de Freitas, Bernardo Freitas Paulo da Costa, Non-convexity measures with applications to improve the convergence of stochastic dual dynamic programming
 - 10:15** Carlos Ernani Fries, Luigi Gianni, Application of Constraint Programming to the sequencing of non-identical parallel machines with sequence-dependent setup and stochastic availability
-

Parallel session - OR in Economy II

December 13, 2022 (Tuesday), 09:00 - 10:40 - Room 1209

Chair: Gabriel Weintraub

- 09:00** Ivan Mauricio Bermudez Vera, Jaime Mosquera Restrepo, Diego Fernando Manotas Duque, Evaluation of the probability of default in a solidarity economy entity with a low default rate using Data Mining
 - 09:25** Hamed Amini, Fire sales and default cascades in complex financial networks
 - 09:50** Olivares Marcelo, Monitoring performance, organizational culture, and the efficiency of public procurement
 - 10:15** Weintraub Gabriel, Marcelo Olivares, Introducing competition for the market: A field study of framework agreements in government procurement
-

CLAIO 2022 detailed program

Parallel session - OR in Energy III

December 13, 2022 (Tuesday), 09:00 - 10:15 - Room 1301

Chair: Vinicius Jacques Garcia

- 09:00** Angelica M. Gonzalez O., Leonardo Rivera Cadavid, Diego Manotas Duque, Prioritization model for the installation of electric Microgrids
- 09:25** Tales Moreira Tavares, Christiano Lyra Filho, Optimal allocation of battery and switches in distribution networks to improve reliability
- 09:50** Henrique Silveira Eichkoff, Daniel Pinheiro Bernardon, Vinicius Jacques Garcia, Lucas Melo de Chiara, Alejandro Caamaño Antelo Pose, On the simulation of demand response alternatives to high seasonal electrical consumers

Parallel session - VRP III

December 13, 2022 (Tuesday), 09:00 - 10:40 - Room 1302

Chair: Conrado Augusto Serna Uran

- 09:00** Alan Osorio-Mora, John Wilmer Escobar, Paolo Toth, A two-phase metaheuristic for solving the multi-depot cumulative capacitated vehicle routing problem
- 09:25** Débora P. Ronconi, João L.V. Manguino, Vehicle routing with time windows and step cost functions: metaheuristic approaches
- 09:50** Michell Queiroz, Kenneth Sörensen, Multi-depot heterogeneous on-demand bus routing problem
- 10:15** Conrado Augusto Serna Uran, Cristian Giovanny Gomez Marín, Agent-based genetic algorithm for solving the multi-depot vehicle routing problem

Parallel session - OR and statistics I

December 13, 2022 (Tuesday), 09:00 - 10:40 - Room 1303

Chair: Julián E. Tornillo

- 09:00** Manuel Cepeda, Pedro Toledo, Factor de corrección para disminuir el sesgo generado por diferencias de criterio de los evaluadores en la postulación a fondos concursables
 - 09:25** Pablo Galaz, Sebastián Mena, Denis Sauré, Bayesian inference of a Markovian model of soccer with application in scouting
 - 09:50** Fredy Troncoso, Richard Weber, Finding Criminal Groups in Suspect Networks
 - 10:15** Pablo B. Savian, Julián E. Tornillo, Guadalupe Pascal, Andres Redchuk, Aplicación de ciencia de datos en patrones de consumo post-pandemia: estudio del caso e-commerce
-

CLAIO 2022 detailed program

Parallel session - OR in Healthcare II

December 13, 2022 (Tuesday), 09:00 - 10:40 - Room 1304

Chair: S. Raghavan

- 09:00** Helenice Florentino, Claudia Pio Ferreira, Antone Benedito, Wolbachia-based biocontrol for dengue reduction
- 09:25** Leonardo Neves, Marcos Negreiros, Bruno Chaves, A space-temporal clustering methodology for Dengue prevention in Fortaleza/CE
- 09:50** Valeria Scapini, Javiera Nuñez, Ramiro Moreno, Incendios forestales y enfermedades respiratorias en la región del Biobío, Chile
- 10:15** Shubham Akshat, S. Raghavan, A continuous scoring model for fair liver transplant allocation

Parallel session - Inventory and supply chain optimization

December 13, 2022 (Tuesday), 09:00 - 10:40 - Room 1305

Chair: Richard Riffo

- 09:00** Victoria G. Achkar, Braulio B. Brunaud, Rami Musa, Ignacio E. Grossmann, Extensions to the guaranteed-service model for safety stock placement in industrial practice
- 09:25** Mario Ramirez, Enrique Simpson, Pablo Escalona, Enfoque temporal para controlar la escasez en sistemas de inventario
- 09:50** Francisco J. Tapia-Ubeda, Pablo A. Miranda, Gabriel Gutiérrez-Jarpa, Supply chain network design integrating supplier selection decisions
- 10:15** Richard Riffo, Carlos Obreque, Guillermo Latorre, Patricio Álvarez, Alex Barrales, Carlos Bizama, El problema del ruteo de un furgón escolar, generalizado, selectivo, con carga mixta y ventanas de tiempo

Parallel session - Machine Learning I

December 13, 2022 (Tuesday), 09:00 - 10:40 - Room 1306

Chair: Julián Andrés Castillo Grisales

- 09:00** Miguel Alfaro, Manuel Vargas, Dali Grado, Jorge Zamorano, Natalia Karstegl, Forecasting time series COVID 19 using deep learning methods: South America comparative case study
 - 09:25** José-Miguel Rubio, Juan José Gutiérrez Terraza, Sebastián Ríos, Optimización del rendimiento de redes móviles utilizando técnicas de aprendizaje automático
 - 09:50** Carla Marina Vairetti, Sebastian Maldonado, Re-etiquetado de categorías en informes de delitos criminales a través de análisis de texto y aprendizaje profundo
 - 10:15** Julian Andres Castillo, Yony Fernando Ceballos, Juan Pablo Barrero Velez, Un modelo híbrido de Machine Learning con Web Scrapping para determinar la dinámica urbana de las construcciones de Medellín - Colombia
-

CLAIO 2022 detailed program

Parallel session - Applications of OR II

December 13, 2022 (Tuesday), 09:00 - 10:40 - Room 1307

Chair: Francisco Jose Mario Vilches Fuentes

- 09:00** Agüero-Tobar Magdiel, Marcela González-Araya, Rosa G. Gonzalez Ramirez, Luis M. Ascencio, Análisis de Eficiencia para los puertos ubicados en el Corredor Bioceánico Capricornio basado en la metodología de Análisis Envoltante de Datos
- 09:25** Oscar Mauricio Cepeda Valero, Jose Fidel Torres Delgado, Luis Felipe Jimenez Sanchez, Andres Bernardo Ocampo Melo, A Stackelberg model for transport infrastructure planning
- 09:50** Juan Pablo Cavada, Cristián E. Cortés, Pablo A Rey, A model-based predictive control strategy for minimizing relocations in inland logistic terminals
- 10:15** Francisco Vilches, Cristián E. Cortés, Andrés Fielbaum, Sistema ridesharing con puntos de pickup/drop off y jerarquización de nodos

Parallel session - Mixed Integer Programming I

December 13, 2022 (Tuesday), 09:00 - 10:15 - Room 1308

Chair: Hector D. Perez

- 09:00** José Costa, Gabriel Sousa, Manoel Campêlo, Exact methods for the Minimum Spanning k-Forest Problem
- 09:25** Salvador J. Vicencio-Medina, Yasmin A. Rios-Solis, Nestor M. Cid-Garcia, MILP + Metaheuristic: A matheuristic for the maximal covering location problem with accessibility indicators and mobile units
- 09:50** Héctor Pérez, Ignacio Grossmann, Extending generalized disjunctive programming to model hierarchical systems

Parallel session - Special session honoring Nelson Maculan I

December 13, 2022 (Tuesday), 09:00 - 10:40 - Room 1309

Chair: Julio Cesar Lopez Luis

- 09:00** Ernesto G. Birgin, Coverings with minimum radius identical balls
 - 09:25** Rafael Andrade, Rommel Saraiva, Emanuel Elias Silva Castelo, Valid inequalities and a new integer programming model for the k-color shortest path problem
 - 09:50** Rafael Andrade, Adriano Freitas, Improved solution strategies for the spanning tree problem with variable node degree
 - 10:15** Julio Lopez, Miguel Carrasco, Sebastián Maldonado, Regularized version of the minimax probability machine
-

CLAIO 2022 detailed program

Plenary session - "Human migration networks: How Operations Research can assist with refugees and supply chain labor shortages," Anna Nagurney (IFORS Distinguished Lecturer), University of Massachusetts, USA

December 13, 2022 (Tuesday), 11:10 - Aula Magna

Chair: Paula Zabala

Humans throughout history have sought locations with better opportunities, amenities, greater safety, etc., for themselves and their families. With global challenges such as: climate change, economic hardship, the COVID-19 pandemic, and geopolitical strife and wars, the migration of humans across space and time is increasing, causing pressures on governments and different societies to respond and act. In this presentation, I will provide an overview of our multidisciplinary work on human migration networks using various methodologies drawn from Operations Research. I will reveal how Operations Research can assist in policy-making in this important domain from the prediction and management of refugee flows to investing in and attracting international migrant labor for the alleviation of labor shortages in a plethora of supply chains.

Parallel session - Ibero-American Network on Multicriteria Evaluation and Decision (RED-M)

December 13, 2022 (Tuesday), 12:30 - 13:45 - Room 1101

Chair: Luciana Alencar

- 12:30** Maria E. B. T. Pessoa, Eduarda A. Frej, Adiel T. de Almeida, An application of the FITradeoff method for ranking problematic in a problem related to the retail sector
- 12:55** Ciro Corrêa Vieira de Melo, Jônatas Araújo de Almeida, A multicriteria decision model based on FITradeoff Method for prioritizing police officers to participate in a special operation
- 13:20** Ana Carolina Silva, Luciana Alencar, A BIM implementation actions prioritization model in AEC organizations

Parallel session - Supply chain optimization I

December 13, 2022 (Tuesday), 12:30 - 14:10 - Room 1208

Chair: Luis Olivares Alvarez

- 12:30** Ignacio Castañeda, Andrea Teresa Espinoza Pérez, Cadena de suministro para la valorización de neumáticos fuera de uso desde un enfoque ambiental: Una aproximación desde la optimización
 - 12:55** Andrea Teresa Espinoza Pérez, Óscar C. Vásquez, Representando la sostenibilidad en el diseño óptimo de una cadena de suministro: Una propuesta integrada y reducida a partir de la revisión de la literatura
 - 13:20** Nicolas Vanzetti, Gabriela Corsano, Jorge M. Montagna, An appropriate assessment of the supply chain performance considering different indicators
 - 13:45** Luis Olivares-Álvarez, Pablo A. Miranda-González, Francisco J. Tapia-Ubeda, The impact of Bullwhip Effect within Supply Chain Network Design
-

CLAIO 2022 detailed program

Parallel session - Machine Learning II

December 13, 2022 (Tuesday), 12:30 - 14:10 - Room 1209

Chair: Jasone Ramírez-Ayerbe

- 12:30** Irma Noemi No, Julián E. Tornillo, Guadalupe Pascal, Leandro Rabbione, Mobile traceability as a machine learning resource in predictive modeling of inland transport fuel demand
 - 12:55** Angel Ruiz, Ana Maria Anaya-Arenas, Julia Isabel Serrato, Implementation of a Machine Learning tool for automatizing abstract screening in literature reviews
 - 13:20** Marcel Goic, Nicolás Aramayo, Mario Schiappacasse, A multi-armed Bandit Approach for house ads recommendations
 - 13:45** Jasone Ramírez-Ayerbe, Emilio Carrizosa, Dolores Romero Morales, One-to-one and many-to-one Counterfactual Explanations for score-based models
-

Parallel session - Lot sizing

December 13, 2022 (Tuesday), 12:30 - 14:10 - Room 1301

Chair: Andrés Vallecilla

- 12:30** Fernanda Ueno, Marcos Furlan, Maristela Santos, MIP-Heuristics for the multi-level capacitated lot sizing problem
 - 12:55** Lucas Gana Reyes, Franco Quezada, Sebastián Dávila, The economic lot sizing problem with remanufacturing and lost sales : complexity analysis and algorithms
 - 13:20** Andrés Vallecilla, Franco Quezada, Sebastián Dávila, The economic lot-sizing problem with remanufacturing, backloging and carbon emission constraint
 - 13:45** Fernando Islas, Pedro Piñeyro, Carlos E. Testuri, Analysis of the lot-sizing problem with remanufacturing and uncertainty in demand and returns
-

Parallel session - OR in Energy IV

December 13, 2022 (Tuesday), 12:30 - 14:10 - Room 1302

Chair: Juan Pablo Orejuela Cabrera

- 12:30** Salomé Rodríguez, Diego Broz, Luis Zeballos, Rodolfo Dondo, Simultaneous optimization of the supply chain configuration and material flows for cogeneration of electrical and thermal energy from forest biomass.
 - 12:55** Enrique Gabriel Baquela, Ana Carolina Olivera, Multi-objective math-heuristic for optimizing the location of electric-scooter sharing-stations
 - 13:20** Orlando Joaqui-Barandica, Diego Fernando Manotas-Duque, Jorge M. Uribe, Decision tools from index fund finance to explore the path towards a scenario of renewable energy generation with globalization and high specialization of regional electricity markets
 - 13:45** Yovany Arley Erazo Cifuentes, Juan Pablo Orejuela Cabrera, Diego Fernando Manotas Duque, Economic comparison of alternatives for the production, storage, and transportation of renewable hydrogen in Colombia
-

CLAIO 2022 detailed program

Parallel session - Algorithms II

December 13, 2022 (Tuesday), 12:30 - 14:10 - Room 1303

Chair: Juan Camilo Yepes Borrero

- 12:30** Vinícius Gusmão Pereira de Sá, Judismar Arpini Junior, Cuckoo Hashing with perfect rehash
- 12:55** Eleazar Madriz, Camilo Rocha, Nelson Maculan, Mauricio Romero, A pseudo polynomial algorithm for optimizing a linear function at the intersection of the closed ball and integer lattice in the n-dimension space
- 13:20** Beatriz Hernández Jiménez, Rafaela Osuna-Gómez, Yurilev Chalco-Cano, Tiago Mendonça da Costa, Quasilinear approximation for interval-valued functions via generalized Hukuhara differentiability
- 13:45** Juan Camilo Yepes Borrero, Federico Perea, Fulgencia Villa, Eva Vallada, Flowshop with additional resources during setups: mathematical models and a GRASP algorithm
-

Parallel session - OR in Agriculture I

December 13, 2022 (Tuesday), 12:30 - 14:10 - Room 1304

Chair: Jorge Luis Recalde Ramírez

- 12:30** Myriam Gaete, Marcela González-Araya, Análisis comparativo de técnicas de minería de datos para la estimación de precio de fruta de exportación: Caso de estudio en una empresa exportadora chilena
- 12:55** Fernando L. Garagorry, Moacir Pedroso Junior, Power indices of game theory and agricultural land use in Brazil
- 13:20** María Margarita López de Recalde, Jorge Vera, Lluís Miquel Plà Aragonés, Jorge L. Recalde-Ramírez, Agricultural operations planning addressing sustainability: a case study for family farmers in Paraguay
- 13:45** Jorge L. Recalde-Ramírez, Jorge Vera, Lluís Miquel Plà Aragonés, María Margarita López de Recalde, A mathematical programming model for the logistic design of an agricultural network and rural schools.
-

CLAIO 2022 detailed program

Parallel session - OR for COVID-19

December 13, 2022 (Tuesday), 12:30 - 14:10 - Room 1305

Chair: Isidro Soria Arguello

- 12:30** William Guerrero, Julian A. Hincapie, Julian Alberto Espejo-Díaz, Juan Manuel Aranda, Valeria Barajas, Wilson A. Camargo, Costing post-COVID-19 surgeries in Colombian hospitals using analytics
- 12:55** Federico Corral Marchant, Eric Forcael Durán, Rodrigo Linfati, Evaluación de la programación laboral a través de un modelo de optimización multiobjetivo en el contexto de la pandemia COVID-19
- 13:20** Sannie Román, Betania Echagüe, Jorge L. Recalde-Ramírez, María Margarita López de Recalde, Mathematical programming application for the assignment of patients, with Covid-19, to ICU beds
- 13:45** Isidro Soria Arguello, Rafael Torres Escobar, Hugo Perez, Tomas Guillermo Perea Rivera, A proposal mathematical model for the vaccines COVID-19 distribution network: A case study in Mexico

Parallel session - Special session honoring Nelson Maculan II

December 13, 2022 (Tuesday), 12:30 - 14:10 - Room 1306

Chair: Jon Lee

- 12:30** Jon Lee, Luze Xu, On perspectivization of convex functions over polytopes
- 12:55** Marcos José, Nelson Maculan, The Periodic Capacitated Centred Clustering Problem
- 13:20** Erik Alex Papa Quiroz, Nancy Baygorrea, Nelson Maculan, Convergence, rate of convergence and finite termination of inexact proximal point methods for multiobjective quasiconvex minimization on Hadamard manifolds
- 13:45** Mauricio Vega-Hidalgo, Lorena Pradenas, Victor Parada, Considering environmental effects in the scheduling of multi-site research projects.

Parallel session - Applications of OR III

December 13, 2022 (Tuesday), 12:30 - 14:10 - Room 1307

Chair: Natalia Paz González González

- 12:30** Maycon Souza, Aurelio Oliveira, Double splitting preconditioner: A new class of preconditioners
 - 12:55** Susana Mondschein, Felipe Subiabre, Natalia Yankovic, Camila Estay, Christian Von Muhlenbrock, Zoltan Berger, Colorectal cancer in Chile: a Latin-American country with marked socioeconomic inequities
 - 13:20** Doris Campo, Lilian Sepulveda, Edwin Barrios, Modelo compartimental de tuberculosis con tratamiento en individuos latentes
 - 13:45** Natalia Paz González González, Cristián E. Cortés, Pablo A. Rey, Un problema de ruteo de vehículos periódico en la gestión de residuos industriales
-

CLAIO 2022 detailed program

Parallel session - Special session honoring Jayme Szwarcfiter II

December 13, 2022 (Tuesday), 12:30 - 14:10 - Room 1309

Chair: Lia Alessandra da Silva Martins

- | | |
|--------------|--|
| 12:30 | Guilherme C. M. Gomes, Bruno P. Masquio, Paulo E. D. Pinto, Vinicius F. dos Santos, Jayme L. Szwarcfiter, Weighted connected matchings |
| 12:55 | Diego Amaro Costa, Sulamita Klein, Fernanda Couto, Providing a new approach to the study of split edge coloring classification problem |
| 13:20 | Paulo Sérgio Carreira, Danilo Artigas, Certifying Algorithms for Convexity in Graphs |
| 13:45 | Lia Martins, Meng Huey Hsu, Raquel Folz, Rosiane de Freitas, Tower of Hanoi variations, pile problems and O.R. applications |
-

CLAIO 2022 detailed program

Parallel session - Ibero-American Network on Multicriteria Evaluation and Decision (RED-M)

December 14, 2022 (Wednesday), 09:00 - 10:40 - Room 1101

Chair: José Luis Zanazzi

- 09:00** Miguel Angel Curchod, Sofia Carla Cortaberría, Modelo híbrido de mapeo de talento
- 09:25** Ygor Logullo, Lorrán Rodrigues, Mischel Carmen Belderrain, Christopher Cerqueira, Pedro Kukulka, Amanda C. S. Silva, Marcos Santos, Using a combined MCDA method to support the choice of the architecture that best performs in space system requirements
- 09:50** José Francisco Zanazzi, José Luis Zanazzi, Daniel Pontelli, Nueva plataforma para el diseño de intervenciones organizacionales. Aplicación a un sistema de mantenimiento en la industria farmacéutica
- 10:15** Solange Garcia, Amanda Silva, Yara Cintra, Luiz Antonio Tilton, Maria Lúcia Bahia Lopes, Mischel Carmen Neyra Belderrain, Compromise programming: Proposal of a decision model for investment evaluation in the context of sustainable development of communities

Parallel session - Routing and Spectrum Allocation I

December 14, 2022 (Wednesday), 09:00 - 10:15 - Room 1208

Chair: Annegret Wagler

- 09:00** Pedro H. Fernandes da Silva, Herve Kerivin, Annegret Wagler, On bounds for the minimum spectrum width for routing and spectrum assignment in optical networks
- 09:25** Pedro H. Fernandes da Silva, Herve Kerivin, Annegret Wagler, A framework for routing and spectrum assignment in optical networks, driven by combinatorial properties
- 09:50** Herve Kerivin, Pedro H. Fernandes da Silva, Michel Morvan, Annegret Wagler, Solving the Routing and Spectrum Assignment Problem with realistic transmission paths in Elastic Optical Networks

Parallel session - Special session honoring Jayme Szwarcfiter III

December 14, 2022 (Wednesday), 09:00 - 10:40 - Room 1209

Chair: Marcos José Negreiros Gomes

- 09:00** Lucía Busolini, Guillermo Durán, Martín D. Safe, Characterization of balanced graphs within claw-free graphs
- 09:25** María Guadalupe Sánchez Vallduvi, Marisa Gutiérrez, Bernardo Llano, The tau operator on oriented indifference graphs
- 09:50** Livia Medeiros, Fabiano Oliveira, Jayme Szwarcfiter, An algorithmic upper bound for the interval count of an order
- 10:15** Marcos Negreiros, AVL is Always AVL!
-

CLAIO 2022 detailed program

Parallel session - OR in Agriculture II

December 14, 2022 (Wednesday), 09:00 - 10:15 - Room 1301

Chair: Cesar David Osorio Castañeda

- 09:00** Javier Gómez-Lagos, Marcela González-Araya, Luis Acosta-Espejo, Wladimir Soto-Silva, Optimizing major fruit tactical harvest planning through a multi-objective metaheuristic based on GRASP with path relinking
- 09:25** Bryan Urra-Calfuñir, Carlos Monardes-Concha, Pablo A. Miranda-González, Production planning optimization of olive growers for the use of mobile Olive-Oil Mills
- 09:50** Cesar David Osorio Castañeda, Juan Pablo Orejuela Cabrera, Juan José Bravo Bastidas, Milk Collection Problem with time dependent energy consumption
-

Parallel session - Logistics II

December 14, 2022 (Wednesday), 09:00 - 10:40 - Room 1302

Chair: Lara Caraballo

- 09:00** Leila Abdala, Javier Marengo, A heuristic procedure for the picker routing problem in a warehouse with mixed shelves
- 09:25** Alvaro Huerta, Pavlo Santander, Juan Sepulveda, Diseño de una cadena de suministro sostenible de recuperación de pilas
- 09:50** Mateo Cal, Daniela Duran, Alejandro Chavez, Víctor Viana, Héctor Cancela, Cooperación logística aplicada al sector forestal
- 10:15** Lara Caraballo, Alejandro Cordatti, Facundo Correa, Pedro Piñeyro, Víctor Viana, Modelo para la planificación eficiente del transporte forestal: Un análisis del transporte bimodal de trozas en Uruguay
-

Parallel session - Applications of OR IV

December 14, 2022 (Wednesday), 09:00 - 10:40 - Room 1303

Chair: Yony Fernando Ceballos

- 09:00** Ricardo García, Zaida E. Alarcón-Bernal, Germán López Bautista, Rankin of PEMEX Exploration and Production budget assignments in terms of efficiency, with the Data Envelopment Analysis (DEA) technique
- 09:25** Sebastián San Martín, Miguel Alfaro, Carlos Castro, Rocío Gajardo, Jeremías Vásquez, Simulación discreta de un servicio de salud intermedio: Caso de estudio servicio de atención primaria de urgencia de alta resolución
- 09:50** Miguel Bagajewicz, Andre Hemerly Costa, New efficient set trimming and smart enumeration method for Mixed-Integer Nonlinear Engineering Problems with discrete independent variables
- 10:15** Yony Fernando Ceballos, Julián Andrés Castillo Grisales, Lina Maria Bastidas Orrego, Natalia Jaramillo, Modelado de políticas públicas asociadas al fortalecimiento de las unidades productivas agrícolas en Medellín
-

CLAIO 2022 detailed program

Parallel session - Algorithms III

December 14, 2022 (Wednesday), 09:00 - 10:40 - Room 1304

Chair: Jessé de Souza Deveza

- 09:00** Zaida E. Alarcón-Bernal, Ricardo Aceves-García, Ricardo Ávila-Gómez, Modeling a freight transportation system with hypergraphs
- 09:25** Silvia Adriana Ramos, María Natalia Piol, Lucas Lavandeira, Matías Reimondo, Santiago Augusto Pinto, Andrea Saralegui, Susana Boeykens, Selección de sistemas sorbato-adsorbente para el tratamiento de efluentes mediante la aplicación de modelos de decisión
- 09:50** Clarice de Souza, João Alfredo Bessa Neto, Micael Davi Lima de Oliveira, Jonathas Nunes da Silva, Kelson Mota, Rosiane de Freitas, Structural prediction and validation strategies for Sars-Cov-2 macromolecules
- 10:15** Jesse Deveza, Lucas Cordeiro, Rosiane de Freitas, Application of interval arithmetic and constraint programming in the optimization of formal verification processes
-

Parallel session - Special session honoring Nelson Maculan III

December 14, 2022 (Wednesday), 09:00 - 10:40 - Room 1305

Chair: Erik Alex Papa Quiroz

- 09:00** Marcella Braga, Nelson Maculan, Renan Pinto, New mixed integer nonlinear optimization models for the Clustering Problem
- 09:25** Gabriel Guimarães, Kelly Poldi, An integer linear programming formulation for the cutting stock problem with limited open stacks
- 09:50** S. Raghavan, Rui Zhang, The Driver-Aide Problem: Coordinated logistics for last-mile delivery
- 10:15** Erik Alex Papa Quiroz, Finite termination and estimation of the solution of the proximal point method with quasiconvex functions on Hadamard manifolds
-

Parallel session - General aspects of OR I

December 14, 2022 (Wednesday), 09:00 - 10:40 - Room 1306

Chair: Claudia Beatriz Peretto

- 09:00** Elias Olivares-Benitez, Jose Humberto Ablanado-Rosas, Aaron Guerrero-Campanur, Samuel Nucamendi-Guillén, A systematic literature review on ethics in Operations Research
- 09:25** Veljko Uskokovic, Mladen Stamenkovic, Veljko Jeremic, A quest for methodologically robust composite index development: A case study for the evaluation of global citizens' wellbeing and liveability
- 09:50** Matías Emiliano Videla, Carlos Chiappa, Pedro Piñeyro, Víctor Viana, Daniel Rossit, Cloud Manufacturing: state of the art and evaluation of the BaSyx project
- 10:15** Claudia Peretto, Enzo Concordano, El sector bancario argentino entre 2000 y 2017: Un análisis de eficiencia paramétrico con funciones de distancia
-

CLAIO 2022 detailed program

Parallel session - VRP IV

December 14, 2022 (Wednesday), 09:00 - 10:40 - Room 1307

Chair: Thailsson Clementino de Andrade

- 09:00** Alejandro Arenas-Vasco, Juan Carlos Rivera, Maria Gulnara Baldoquin, Simón Álvarez, Effects of different formulations and software parameters over a Heterogeneous Fleet Multi Depot Periodic Capacitated Vehicle Routing Problem with Time Windows
- 09:25** Daniel Morillo-Torres, Aura M. Vargas-Quintero, Álvaro I. Ocampo-Jiménez, Gustavo Gatica, A novel stochastic optimization model to solve the Vehicle Routing Problem with Backhauls and Time Windows by integrating the sample average approximation with Goal Programming
- 09:50** Fernando R. Senna, Pedro Munari, Antonio C. Moretti, Reinaldo Morabito, The Vehicle Routing Problem with Time Windows and Multiple Deliverymen considering two-level decisions: formulations and solution methods
- 10:15** Thailsson Clementino, Rosiane de Freitas, Eduardo Uchoa, Notes on the Vehicle Routing Problem with time windows and scheduling constraints

Parallel session - Special session honoring Andrés Weintraub

December 14, 2022 (Wednesday), 09:00 - 10:40 - Room 1309

Chair: Pablo Rey

- 09:00** Alejandro Alvarez, Guillermo Duran, Manuel Duran, Ivan Monardo, 301060.exactas.uba.ar: A homage to Diego Maradona through mathematical models for Qatar 2022 results prediction
- 09:25** Filipe Alvelos, David Neto, Eduardo Cunha, Mendes André, An optimization framework for fire-related decision making
- 09:50** Benjamín Ulloa Sanhueza, Cristián E. Cortés, Pablo A. Rey, Raúl Espinoza, Marco de integración meso-microscópica enfocada en la simulación de tráfico de buses de transporte público
- 10:15** Alejandro Cataldo, Arturo Wenzel, Antoine Sauré, Pablo Rey, Enfoque de Modelos de Decisión Markovianos para la calendarización de sesiones de quimioterapia en una red de centros oncológicos

Plenary session - "'Keep on Learning': towards the development of optimisers that continually adapt", Emma Hart (EURO Distinguished Lecturer), Edinburgh Napier University

December 14, 2022 (Wednesday), 11:10 - Aula Magna

Chair: Mariana Escalante

CLAIO 2022 detailed program

Parallel session - Ibero-American Network on Multicriteria Evaluation and Decision (RED-M)

December 14, 2022 (Wednesday), 12:30 - 13:45 - Room 1101

Chair: Carmen Belderrain

- 12:30** Lana Priscila Cavadas da Silva, Lincoln Campelo Dias, Pablo Luiz Berriel Do Carmo Teófilo, Níssia Carvalho Rosa Bergiante, Ensino público brasileiro: Proposta de estruturação da implantação do novo ensino médio pela ferramenta de pesquisa operacional soft SCA
- 12:55** Hudson Hübner de Souza, Pedro Soares de Souza, Pablo Luiz Berriel Do Carmo Teófilo, Lana Priscila Cavadas da Silva, Níssia Carvalho Roas Bergiante, Identification of Values and Alternatives for Decision Making through the VFT Approach: a case study in Maracanã Village
- 13:20** Maria Júlia Menezes Firmino Lima, Ana Carolina Cordeiro Luna Martins Silva, Luciana Alencar, Using value-focused thinking to support the BIM implementation in construction projects of public administration

Parallel session - Routing and Spectrum Allocation II

December 14, 2022 (Wednesday), 12:30 - 13:20 - Room 1208

Chair: Hervé Kerivin

- 12:30** Mariana Escalante, Martín Matamala, Ivan Rapaport, Paola Tolomei, Luis M Torres, On the weighted Minimum Clique Routing Problem
- 12:55** Federico Bertero, Javier Marenco, Valid inequalities for the DR-AOV integer programming formulation of the routing and spectrum allocation problem

Parallel session - General aspects of OR II

December 14, 2022 (Wednesday), 12:30 - 14:10 - Room 1209

Chair: Guadalupe Pascal

- 12:30** Laura Plazola Zamora, Algunas reflexiones sobre la brecha de género en la Sociedad Mexicana de Investigación de Operaciones
- 12:55** Cristóbal Mauricio, Óscar C. Vásquez, Estrategias para afrontar un test: Una mirada desde la secuenciación con incertidumbre explorable
- 13:20** Melany Segarra Marinetti, María Alejandra Castellini, A survey on soft IO and multimethodology in Latin America
- 13:45** Marcelo Corbalan, Guadalupe Pascal, Andres Redchuk, Desarrollo de casos sobre optimización y programación matemática para la formación de competencias en Investigación Operativa
-

CLAIO 2022 detailed program

Parallel session - Logistics III

December 14, 2022 (Wednesday), 12:30 - 14:10 - Room 1301

Chair: Robert Dell

- 12:30** Lucas Thomaz Januario Pinto, Willy Alves de Oliveira Soler, Maristela Oliveira Santos, A mathematical model for production and distribution planning of credit cards
- 12:55** Mauro Lucci, Paula Zabala, Daniel Severin, Un abordaje mediante PLE para un problema de transporte de mercadería con cambios de tripulación
- 13:20** Sergio Bonino, Luis Zeballos, José Laínez Aguirre, Akash Moolya, Jose Pinto, Ignacio Grossmann, Carlos Mendez, Advanced MILP-based strategies for logistics decisions in industrial gases supply chains
- 13:45** Robert Dell, David Marlow, Optimizing management of a military aircraft fleet
-

Parallel session - Graph theory and combinatorial optimization

December 14, 2022 (Wednesday), 12:30 - 14:10 - Room 1302

Chair: Luis F. Zuluaga

- 12:30** Vitor Tocci F. de Luca, María Pía Mazzoleni, Fabiano S. Oliveira, Jayme L. Szwarcfiter, On edge intersection graphs of paths on a triangular grid: Characterization and clique coloring
- 12:55** Pablo De Caria, María Pía Mazzoleni, María Guadalupe Payo Vidal, Sobre la Clique Coloración de los Grafos EPT en árbol huésped de grado acotado
- 13:20** Liliana Alcón, Martin Charles Golumbic, Noemí Amalia Gudiño, Marisa Gutierrez, Vincent Limouzy, On dually-CPT and strong-CPT posets
- 13:45** Rodolfo Quintero, David Bernal, Tamás Terlaky, Luis Zuluaga, Characterization of QUBO reformulations for the maximum k-colorable subgraph problem
-

Parallel session - Applications of OR V

December 14, 2022 (Wednesday), 12:30 - 14:10 - Room 1303

Chair: Juan David Palacio Domínguez

- 12:30** Maria Araceli Garin, Laureano F. Escudero, Aitziber Unzueta, On Lagrangean Dualization of the RLT1 formulation for the Cross-dock Door Assignment Problem
- 12:55** Hector Cancela, Marcos Fierro, Adrián Manera, Martín Prino, Optimization methods for units' assignment in housing cooperatives
- 13:20** Citlali M. Olvera-Toscano, Yasmín A. Ríos-Solís, Roger Z. Ríos-Mercado, Comparative analysis of different solution methods for the bus bunching problem
- 13:45** Juan David Palacio, Juan Carlos Rivera, The two-echelon bicycle repositioning problem with split delivery
-

CLAIO 2022 detailed program

Parallel session - Supply chain optimization II

December 14, 2022 (Wednesday), 12:30 - 14:10 - Room 1304

Chair: Marco Antonio Montufar Benitez

- 12:30** Franco Basso, Guillermo Ibarra, Raul Pezoa, Mauricio Varas, Horizontal collaboration in the wine supply chain planning: A Chilean case study
- 12:55** Roberto Miranda, Carlos Monardes, Elbio Avanzini, Info Gap Decision Theory for handling deep uncertainties in an Agribusiness Supply Chain
- 13:20** Isabel Cristina Alzate Rendón, Eva Cristina Manotas Rodríguez, The impact of supply chain dynamic capabilities and horizontal collaborative networks over collaborative risk management: The case of Hass Avocado in Antioquia - Colombia
- 13:45** Eder Renato Delgado Ávila, Lucero Ramírez Melo, Marco Antonio Montúfar Benítez, Gilberto Pérez Lechuga, Sergio Blas Ramírez Reyna, Set Covering Problem applied to relocation of a supply center

Parallel session - Queueing theory and metaheuristics

December 14, 2022 (Wednesday), 12:30 - 14:10 - Room 1305

Chair: Vladimír Holý

- 12:30** Anshul Kumar, Madhu Jain, Cost optimization and analysis of multi-server queue with working vacation and imperfect service
- 12:55** Sibasish Dhibar, Prof. Madhu Jain, Firefly algorithm for cost optimization of FM/FM/1/WV retrial queue with catastrophes
- 13:20** Mauricio Moyano, Nicolle Ojeda-Ortega, Paula Zabala, Gustavo Gatica, Guillermo Cabrera-Guerrero, Multi-objective evolutionary algorithms for Bi-objective Composite Retrieval
- 13:45** Vladimír Holý, Ondřej Sokol, Modeling customer visits by score-driven model with negative binomial distribution

Parallel session - OR and the environment I

December 14, 2022 (Wednesday), 12:30 - 14:10 - Room 1306

Chair: Michelle Zambra

- 12:30** Jaime Carrasco, Florencia Cristensen, Jorge Hoyos-Santillan, Mauricio Acuna, Alejandro Miranda, Cristobal Pais, Andrés Weintraub, Mitigation of greenhouse gas emissions through landscape management
 - 12:55** Antone dos Santos Benedito, Claudia Pio Ferreira, Helenice de Oliveira Florentino Silva, Feedback linearization and optimal control for Aedes aegypti populations
 - 13:20** Nathaly Martínez Escobar, Jeniffer Guadalupe Insuasty Reina, Juan Carlos Osorio Gómez, Diego Fernando Manotas Duque, Evaluación dinámica de los efectos ambientales de la inclusión de hidrógeno como vector energético no convencional en Colombia
 - 13:45** Michelle Zambra, Pablo Miranda, Carola Blazquez, A multiperiod household solid waste collection system for a set of rural islands with transfer port selection
-

CLAIO 2022 detailed program

Parallel session - Stochastic optimization III

December 14, 2022 (Wednesday), 12:30 - 14:10 - Room 1307

Chair: Nicolás Vargas Cisternas

- 12:30** Iago Leal de Freitas, Joaquim Dias Garcia, A Multicut Approach to Calculate Upper Bounds for Risk Averse SDDP
- 12:55** Victor Viana, Hector Cancela, Lorena Pradenas, Optimización Estocástica aplicada a la planificación forestal en Uruguay
- 13:20** Germán Ferrari, Carlos E. Testuri, Alberto Pardo, Lenguaje de dominio específico embebido para programación estocástica multietapa en Scala
- 13:45** Nicolas Vargas, Mathias Klapp, Alejandro Mac Cawley, Two stage portfolio optimization for commodity exports

Parallel session - Planning and urban planning

December 14, 2022 (Wednesday), 12:30 - 14:10 - Room 1308

Chair: Fabrizio Nadir Recalde Rivas

- 12:30** Rodrigo Santos, Paula Zabala, Matías Micheletto, Heurística de asociación y planificación de mensajes periódicos de tiempo real en ciudades inteligentes basadas en una extensión del protocolo LoRaWAN
- 12:55** Diego Fiorotto, Silvio de Araujo, Raf Jans, Problema integrado da mistura e dimensionamento de lotes
- 13:20** Jakub Hanousek, Evaluation of quality of life by data envelopment analysis
- 13:45** Fabrizio Nadir Recalde Rivas, Jorge L. Recalde-Ramírez, María Margarita López de Recalde, Surveillance and security managing of municipal parks through servers location: the case of the Asunción Botanical Garden and Zoo

Parallel session - OR and statistics II

December 14, 2022 (Wednesday), 12:30 - 14:10 - Room 1309

Chair: Deisemara Ferreira

- 12:30** Charles Thraves, Sebastián Morales, Parametric estimation under diffuse observations: An application on pooling election polls
 - 12:55** Gastão Coelho Gomes, Probabilidade, Jogos de Azar e o Software R
 - 13:20** Rafael Jiménez Llamas, Pepa Ramírez Cobo, Emilio Carrizosa Priego, Fairness in linear regression. A novel approach from a Bayesian perspective
 - 13:45** Felipe Goulart Moraes, Deisemara Ferreira, Reinaldo Morabito, Pedro Miranda Lugo, A study of the effects of considering carbon emissions on the production planning and vehicle routing problem in a furniture industry
-

CLAIO 2022 detailed program

Parallel session - Ibero-American Network on Multicriteria Evaluation and Decision (RED-M)

December 15, 2022 (Thursday), 09:00 - 10:15 - Room 1101

Chair: Mariana Funes

- 09:00** Jessyca Samarithana Ferreira Aires, Caroline Mota, Duan Vilela Ferreira, Ciro José Jardim de Figueirêdo, Paulo Antônio Xavier Furtado, Suitability analysis for photovoltaic solar energy generation based on GIS-MCDM integration
- 09:25** Javier Pereira, Pedro Contreras, Danielle Morais, Comparison of stochastic multiobjective acceptability analysis based methods in a multi-criteria location problem
- 09:50** Hernán Pablo Guevel, Josefina Racagni, Mariana Funes, José Miguel Vargas Soria, Confección de carteras de activos que cotizan en el mercado de valores argentino aplicando una metodología en etapas

Parallel session - DEA

December 15, 2022 (Thursday), 09:00 - 10:40 - Room 1208

Chair: Mariana Arburua

- 09:00** Samuel Martins Drei, Lidia Angulo-Meza, Lean Healthcare efficiency assessment in Brazilian public hospitals using Slack-based Measure Data Envelopment Analysis (SBM-DEA)
- 09:25** Elias Olivares-Benitez, Jose Humberto Ablanedo-Rosas, Aaron Guerrero-Campanur, Evaluación de la eficiencia de cultivos de Aguacate Hass usando Análisis Envoltante de Datos
- 09:50** Fabio Sartori Piran, Daniel Pacheco Lacerda, Maria Conceição A. Silva, Ana S. Camanho, Ricardo A. Cassel, Internal benchmarking to assess the cost efficiency intra and inter production unit: an exploratory analysis combining data envelopment analysis and throughput accounting
- 10:15** Patricia Alejandra Iñiguez, Juan Manuel Gallardo, Mariana Arburua, Pablo Pagano, Fernando Javier Negro, Métodos de selección de variables para la evaluación de la eficiencia con modelos DEA y datos de panel. Revisión de algunos enfoques.
-

CLAIO 2022 detailed program

Parallel session - Facility location

December 15, 2022 (Thursday), 09:00 - 10:40 - Room 1209

Chair: Giovanni Giuliano

- 09:00** Paulina Tapia, Pablo Escalona, Alejandro Angulo, The Joint Location-Inventory Problem under continuous review (Q, r) policy with Fill-rate service level constraint
- 09:25** Steven Chau Yip, Armin Lüer-Villagra, A profit-maximizing hub network design problem considering users' probabilistic utility functions
- 09:50** Cindy Infante Eguis, Jesús Mora Movilla, Carlos Torres Morales, Kelly Bejarano Movilla, Andrés Porto Solano, Álvaro Mercado Cruz, Effective location of technological laboratories in rural municipalities of the Atlántico department, Colombia: A two-stage stochastic optimization model
- 10:15** Giovanni Giuliano, Pablo A. Miranda, Francisco J. Tapia-Ubeda, A two-stage inventory location problem model for resilient and robustness supply chain network design

Parallel session - OR in Energy V

December 15, 2022 (Thursday), 09:00 - 10:40 - Room 1301

Chair: Maria Camila Aristizábal Cataño

- 09:00** Ellen Cavalheiro, Christiano Lyra, Optimal network configuration for multiperiod operation of power distribution systems equipped with smart grid innovations
- 09:25** Nicolás Allendes, Francisca Jalil, Tito Homen-de-Mello, Gabriela Pinto, Renewable energy-based hydrogen supply chains, a Chilean case study for green hydrogen production limited to water conditions
- 09:50** Laura Ribeiro Fardin, Christiano Lyra Filho, Upstream-Downstream Optimization of Volt-Var Control in distribution networks
- 10:15** Maria Camila Aristizábal Cataño, Martha Carolina Lima Rivera, Juan Pablo Orejuela Cabrera, Diego Fernando Manotas Duque, Portafolio de generación de energía eléctrica en mercados hidrotérmicos considerando las fuentes no convencionales de energía renovable, caso de estudio Colombia
-

CLAIO 2022 detailed program

Parallel session - TSP

December 15, 2022 (Thursday), 09:00 - 10:40 - Room 1302

Chair: Natalia Estefanía Villanueva De la Fuente

- 09:00** Gustavo Angulo, Diego Moran, On Optimal MTZ-like Formulations For The Asymmetric TSP
- 09:25** Ondřej Sokol, Vladimír Holý, Efficient team orienteering problem: A sightseeing tour optimization
- 09:50** Saúl Domínguez Casasola, José Luis González Velarde, Yasmín Á. Ríos Solís, A comparison between exact and non-exact methods for solving the Capacitated Family Traveling Salesperson Problem
- 10:15** Natalia Villanueva De la Fuente, Carlos Obreque Níñez, Guillermo Latorre Núñez, Patricio Álvarez Mendoza, Alex Barrales Araneda, Carlos Bizama Fica, The Multiperiod Set Team Orienteering Problem with Time Windows

Parallel session - Metaheuristics

December 15, 2022 (Thursday), 09:00 - 10:40 - Room 1303

Chair: Antonio Augusto Chaves

- 09:00** Petra Tomanová, Vladimír Holý, Mean-Variance optimization in pairs trading using ultra-high-frequency data
- 09:25** Carlos Rodriguez, Katya Rodriguez, Applying a multi-objective evolutionary algorithm in portfolio optimization
- 09:50** José-Fernando Camacho-Vallejo, Juan G. Villegas, Carlos Corpus, A review about the use of metaheuristic algorithms for solving bilevel programming problems: beginnings, consolidation and present
- 10:15** Bruno Vieira, Antonio Augusto Chaves, An adaptive BRKGA-QL to solve the Patient Bed Assignment Problem and the Operating Room Scheduling Problem

Parallel session - OR in Economy III

December 15, 2022 (Thursday), 09:00 - 10:40 - Room 1304

Chair: Eduar Fernando Aguirre González

- 09:00** Guillermo Gallego, Gerardo Berbeglia, Bounds and heuristics for Multi-Product Personalized Pricing
 - 09:25** Paloma Nuñez-Muñoz, Óscar C. Vásquez, Economía circular y sistemas productivos en países del Sur Global: ¿Fomentando nuevos commodities?
 - 09:50** Veljko Jeremic, Vesna Damjanovic, Radmila Janicic, Mapping the startup ecosystem of emerging countries: Methodological challenges and policy implications for Serbia
 - 10:15** Eduar Fernando Aguirre Gonzalez, Diego Fernando Manotas Duque, Pablo Cesar Manoyoma Velásquez, Efficiency and performance evaluation model of collective investment funds in Colombia
-

CLAIO 2022 detailed program

Parallel session - Rostering and applications

December 15, 2022 (Thursday), 09:00 - 10:40 - Room 1305

Chair: Sara Ruth Peralta Chávez

- 09:00** Andrés Porto Solano, Paola Cruz Mayoral, Anyela Mejía Nuñez, Yira Pedrozo Contreras, Sebastián Herazo Pretelt, Lina Piocuda Vasquez, Annualized hours contract with flexible working day: A personnel planning approach
- 09:25** Jennifer Izquierdo-Salazar, Sofía Charry-Alvernia, Sebastián Orjuela-Isazaa, Ronaldo Caicedo-Scarpetta, Daniel Morillo-Torres, Gustavo Gatica, Design of a realistic multifunctional staffing model for the reduction of labor force costs in the retail sector
- 09:50** Andrés Porto, César Henao Botero, Amaia Lusa, Oliver Polo, Roberto Porto, Labor Flexibility Strategies: Annualized hours, multiskilling and overtime to solve an a Personnel Scheduling Problem
- 10:15** Sara Ruth Peralta Chavez, Sara Alexandra Ruiz Díaz Villagra, María Margarita López de Recalde, Jorge L. Recalde-Ramírez, Production and inventory planning of silk skeins from the breeding of Bombyx Mori worms using mathematical models

Parallel session - Simulation II

December 15, 2022 (Thursday), 09:00 - 10:40 - Room 1306

Chair: Marco Antonio Montufar Benitez

- 09:00** David Mora-Meza, Julian Alberto Espejo-Díaz, William Guerrero, Finding the bottleneck in hospital emergency departments considering the COVID 19 pandemic. Insights from a simulation approach and a case study
- 09:25** Natalia Karstegl, Manuel Vargas, Miguel Alfaro, Guillermo Fuertes, Diego Muñoz, Simulación de agente para la modelación de la epidemia COVID-19 mediante cuarentenas intermitentes
- 09:50** Jaromír Antoch, Lev Klebanov, Michal Cerny, Estimation of the quantile function using Bernstein polynomials and its use for steady state simulations and VaR estimation
- 10:15** Marco Antonio Montufar-Benitez, Jaime Mora-Vargas, Carlos Arturo Soto-Campos, Gilberto Pérez-Lechuga, José Raúl Castro-Esparza, A simulation model to analyze the behavior of a faculty retirement plan. A case Study in México
-

CLAIO 2022 detailed program

Parallel session - Column generation

December 15, 2022 (Thursday), 09:00 - 10:40 - Room 1307

Chair: Renaud Chicoisne

- 09:00** Ignacio Vitale, Mariana C ccola, Rodolfo Dondo, Optimization of log Inventory and log routing by column generation
- 09:25** Felipe Lemos, Adriana Cherri, Silvio Alexandre de Araujo, Cutting stock problem integrated to the minimization of weighed tardiness
- 09:50** Victor Hugo Nascimento, Luidi Gelabert Simonneti, A new branch and price algorithm for the Stop Number Minimization Problem
- 10:15** Renaud Chicoisne, Computational aspects of column generation methods for nonlinear optimization

Parallel session - Combinatorial optimization II

December 15, 2022 (Thursday), 09:00 - 10:40 - Room 1308

Chair: Manuela Blaum

- 09:00** Pablo Terlisky, Francisco Soullignac, Javier Marengo, Integrality of the representation polyhedron for circular-arc models
- 09:25** Mariana Escalante, Erica G. Hinrichsen, Valeria Alejandra Leoni, On a characterization of graphs with perfect neighbourhood matrices
- 09:50** Blanca Irene Rios Ceupen, Jose Colbes, Diego P. Pinto-Roa, Planificaci n del ciclo productivo de lotes av colas en granjas parrilleras. Caso de estudio
- 10:15** Manuela Blaum, Javier Marengo, Generalization of rank inequalities for several MIP models

Parallel session - Special track: OR in Health and Healthcare Services I

December 15, 2022 (Thursday), 09:00 - 10:40 - Room 1309

Chair: Fermin Mallor

- 09:00** Blanca Sanchez-Robles, Ricardo Diaz, Efficiency in the CRO industry: A DEA analysis
 - 09:25** Daniel Garcia-Vicu a, Laida Esparza, Fermin Mallor, A methodological framework for analyzing the physician decision-making process for ICU bed management
 - 09:50** Maria Carolina Poveda, David Barrera Ferro, Sally Brailsford, Raul Murillo, Diego Patino, Prioritizing patients for upper gastrointestinal endoscopy: A machine learning approach
 - 10:15** Juan Pablo Contreras, Mauricio Varas, Franco Basso, Ra l Pezoa, Felipe Baesler, Mar a Francisca Rojas, Ricardo Ronco, Scheduling home health care services: a case study in the Chilean public sector
-

CLAIO 2022 detailed program

Plenary session - "Applied mathematical optimization: success stories in logistics and planning", Antonio Alonso-Ayuso, Universidad Rey Juan Carlos, Spain

December 15, 2022 (Thursday), 11:10 - Aula Magna

Chair: Pablo Rey

The DSLab (Data Science Lab) of the Universidad Rey Juan Carlos (Madrid, Spain) has a research group specialized in Mathematical Optimization (linear, discrete, and stochastic) applied to planning and logistics problems. In this talk, we will present the last problems in which this group has worked applying Discrete Mathematical Optimization for the improvement of production processes in two large companies.

First, with an oil company, we have developed a model for tactical (one year ahead) and operational (several days ahead) planning of the logistics network for distribution in a Latin American country, achieving significant cost savings with an improvement in the level of service.

The second problem analyzed is framed in the steel industry. In collaboration with a leading company in Spain, we have developed models to design the cutting patterns of steel coils, taking into account that the stock is heterogeneous and that both the customers and the slitting lines impose many technical constraints on the final product (conditions that depend on the operation mode). The results are a great improvement for the company and a reduction by more than 60% the leftovers, improving stock management.

Finally, we will introduce the first results that we are obtaining in collaboration with a Spanish company dedicated to the manufacture of honeycomb cardboard, where the first models are representing a great improvement in the reduction of leftovers (up to 90% in some cases).

A coming characteristic of those approaches is the dramatic reduction in the time needed for planning: from several hours to just a few minutes.

Parallel session - Networking session: Democratization of Operations Research through Artificial Intelligence, Cipriano Santos, Tecnológico de Monterrey, México

December 15, 2022 (Thursday), 14:00 - Room 1101

Chair: José Gómez Rocha

CLAIO 2022 detailed program

Parallel session - OR and sustainability

December 15, 2022 (Thursday), 14:00 - 15:40 - Room 1208

Chair: Demian J. Presser

- 14:00** Matias Ponce Toro, Andrea Espinoza, Priorización de objetivos para el desarrollo de cadenas de abastecimiento sostenibles
- 14:25** Karen Angelica Pérez Rojas, Marcela González-Araya, Lidia Angulo Meza, Alfredo Iriarte, La influencia de la sustentabilidad social en la eficiencia de las ciudades al enfrentar una pandemia
- 14:50** Virna Ortiz-Araya, Adela Pagès-Bernaus, Optimización sustentable en una cadena de suministro empleando un modelo de ruteo vehicular con tiempos de servicio estocásticos
- 15:15** Demian J. Presser, Diego C. Cafaro, Ignacio E. Grossmann, Pratik Misra, Sanjay Mehta, Towards the optimal management of carbon intensity indicators in the operation of sustainable supply chains

Parallel session - OR in Energy VI

December 15, 2022 (Thursday), 14:00 - 15:40 - Room 1209

Chair: Caio dos Santos

- 14:00** Sebastian Felipe Castellanos Buitrago, Pablo Andrés Maya Duque, Walter Mauricio Villa Acevedo, Santiago Marulanda Escobar, Mateo Giraldo Zuluaga, Two-phase approach model for sizing microgrids in non-interconnected zones of Colombia
- 14:25** Tito Homem-de-Mello, Frederic Babonneau, Esnil Guevara, Modeling uncertainty processes for multi-stage optimization of strategic energy planning
- 14:50** Andre Salles, Ana Carolina Carvalho Souza, Some considerations on similarities of the energy transition processes of national economies using clustering models
- 15:15** Caio dos Santos, José Carlos Garcia Andrade, Christiano Lyra, Optimized reinforcement planning of modern power distribution systems to support the electric vehicle charging infrastructures

Parallel session - Scheduling II

December 15, 2022 (Thursday), 14:00 - 15:40 - Room 1301

Chair: Jean Paul Morán Zabala

- 14:00** Aldana Stefanía Tibaldo, Jorge Marcelo Montagna, Yanina Fumero, A bi-objective optimization model for simultaneous short-term production and distribution scheduling in process industries
 - 14:25** Guillermo A. Durán, Manuel Durán, Nazareno A. Faillace Mullen, Juan Velasquez, Optimizing the production scheduling of a manufacturer of bottle closures
 - 14:50** Jeanette Rodriguez, Daniel Rossit, Scheduling in additive manufacturing problems
 - 15:15** Jean P. Morán-Zabala, Juan M. Cogollo-Flórez, An optimization approach for process quality profile modeling
-

CLAIO 2022 detailed program

Parallel session - OR and the environment II

December 15, 2022 (Thursday), 14:00 - 15:40 - Room 1302

Chair: Katherin del Pilar López Cartes

- 14:00** Maria Ignacia Rivera, Manuel Vargas, Jorge Zamorano, Aceptabilidad de políticas ambientales y reducción de emisiones
- 14:25** Felipe Rivera Pradenas, Jorge Zamorano, Manuel Vargas, Localización de empresas bajo regulación ambiental y tecnologías de abatimiento
- 14:50** Jorge Pavez, Isabel Trivino, Jorge Zamorano, Manuel Vargas, Rol del mecanismo de asignación de permisos de contaminación en los incentivos de reubicación de empresas.
- 15:15** Felipe Rivera Pradenas, Katherin López, Jorge Zamorano, Localización de firmas bajo múltiples instrumentos económicos en la consistencia temporal de la regulación ambiental

Parallel session - Game theory

December 15, 2022 (Thursday), 14:00 - 15:40 - Room 1303

Chair: Conrado Miguel Manuel García

- 14:00** Enrique Simpson, Pablo Escalona, Nathalia Wolf, Luce Brotcorne, Spot fare inspections under non-adaptive opportunistic passengers and mass inspection policy using a Stackelberg game approach
- 14:25** Mario Ramirez, Pablo Escalona, Luce Brotcorne, Fare inspection patrolling under in-station selective inspection policy using a Stackelberg approach
- 14:50** Juan Tejada, Elisenda Molina, Fairouz Medjahed, Competencia en la difusión de la información y estrategias de centralidad en redes sociales
- 15:15** Elena Gavilán, Conrado Manuel, Daniel Martín, Communication in weighted networks. A game theoretic approach

Parallel session - Logistics IV

December 15, 2022 (Thursday), 14:00 - 15:40 - Room 1304

Chair: Edgar Ricardo Silva Russi

- 14:00** Jefferson Matos, Vitor Curtis, FLP for last mile distribution centers: comparison between GRASP and Genetic Algorithm metaheuristics
 - 14:25** Marcos Negreiros, Augusto Palhano, Eduardo Reis, General sector-routing, application results in downtown Petropolis/RJ
 - 14:50** Bryan David Galarza Montenegro, Kenneth Sörensen, Pieter Vansteenwegen, Towards better service quality with the dynamic feeder service with a maximum headway at mandatory stops
 - 15:15** Edgar Ricardo Silva Russi, Nacima Labadie, Caroline Prodhon, The two-echelon vehicle routing problem with customer to parcel locations and grey zone for inner-city logistics
-

CLAIO 2022 detailed program

Parallel session - Combinatorial optimization III

December 15, 2022 (Thursday), 14:00 - 15:40 - Room 1305

Chair: Lanier Menezes dos Santos

- 14:00** Letícia Pavanello, Carlos Diego Rodrigues, Adriana Cherri, Uma matheurística de janela deslizante para o floorplanning VLSI
- 14:25** Abilio Lucena, Vinicius Forte, Said Hanafi, New formulations for perfect domination problems and their algorithmic implications
- 14:50** Matheus Corrêa, Abilio Lucena, Formulations and algorithms for arc reversal, arc addition or arc complement in digraphs
- 15:15** Lanier Santos, Jesse Deveza, Lucas Cordeiro, Rosiane de Freitas, Combinatorial methods to explore CFG paths in BMC counterexamples

Parallel session - Machine Learning III

December 15, 2022 (Thursday), 14:00 - 15:40 - Room 1306

Chair: Lauriza del Carmen Díaz Díaz

- 14:00** Veronica Diaz, Ricardo Montoya, Oded Netzer, The effects of pregnancy and child birth on consumption
- 14:25** Xavier Gonzalez, Horacio Rojo, Silvia Ramos, Facundo Andres Toniolo, Sofia Maira Parrino, Joaquin Renovales, Juan Palomeque, Noelia Lucia Florez Uría, Mateo Marco, Julieta Belén Romanelli, Desarrollo e Implementación de modelo corrector de definiciones en exámenes de Investigación Operativa basado en Inteligencia Artificial. Conozcan a BotIO, una experiencia pedagógica
- 14:50** Nuria Gómez-Vargas, Rafael Blanquero, Emilio Carrizosa, Custom neural networks: an approach to predict-and-optimize
- 15:15** Danna Vanessa Betancourt Martínez, Lauriza Del Carmen Díaz Díaz, Integration of machine learning with the AHP for the evaluation and improvement of the availability of vital medicines in the Colombian health system: A hospital logistics solution

Parallel session - Mixed Integer Programming II

December 15, 2022 (Thursday), 14:00 - 15:40 - Room 1307

Chair: Iván Derpich

- 14:00** Matias Anabalon, Franco Quezada, Óscar C. Vásquez, A branch-and-cut algorithm to solve the knapsack problem with scheduled items
 - 14:25** Luciana Melchiori, Graciela Nasini, Jorge Marcelo Montagna, Gabriela Corsano, An integer linear programming model for the daily transportation planning in the sugarcane industry
 - 14:50** Nicolás García Aramouni, Juan Jose Miranda Bront, Rescheduling the NBA regular season via Integer Programming
 - 15:15** Ivan Derpich, Erick Miranda, Estimando el tamaño del árbol B&B in the Multidimensional knapsack problem (MKP)
-

CLAIO 2022 detailed program

Parallel session - Special track: OR in Health and Healthcare Services II

December 15, 2022 (Thursday), 14:00 - 15:15 - Room 1309

Chair: Fermin Mallor

- 14:00** Marta Cildoz, Pedro Mateo, Fermin Mallor, Physician scheduling in Emergency Departments: from the real problem to the solution implementation
- 14:25** Thiago A. O. Silva, Mauricio C. De Souza, Approximate dynamic programming to improve the scheduling of chemotherapy outpatients
- 14:50** Ignacio Aristimuño, Valentina Larzábal, María Eugenia Silvera, Pedro Piñeyro, Antonio Mauttone, Simulation in healthcare management: application to the emergency room of a hospital in Uruguay

Plenary session - "OR in Healthcare in Latin Ibero-America: Developments and research perspectives", Valentina Gutiérrez, Universidad del Valle, Colombia

December 15, 2022 (Thursday), 16:00 - Aula Magna

Chair: Paula Zabala

Since the beginning of the 80's, the Operations Research (OR) community in Latin America has worked on OR applications in healthcare decision problems. However, much of that work is unknown or not published in international journals. Additionally, after more than 40 years, there is no formal group in the region contributing to structure and spread the work, showing the need to formalize the critical mass and promote the development of the field. Based on this need, initial efforts to formalize a working group in the region and to establish collaborating networks with the European community have taken place from Colombia. Thereby, in this work, we provide a comprehensive overview of the works completed by researchers in the region dedicated to study OR in healthcare, and then we identify collaboration opportunities with the community. Using a scientific database, we complete a structured literature review replicating previous taxonomies widely accepted in the field. We also identify key differences when using OR to support decisions in healthcare in the region. Preliminary results of the review, show an increasing interest of the community to study healthcare research problems. Furthermore, given the formalization of the Healthcare Working Group on OR in the Colombian Association of Operations Research (ASOCIO), we present a set of applications that can contribute to establish collaborating works and to generate a more mature community in the region.

CLAIO 2022 detailed program

Plenary session - "A stochastic programming approach for the operational fleet composition problem", Ramon Faganello Fachini and Camila Fernanda Contreras, Shipping OR Team, Mercado Libre, Argentina + Brazil + Chile

December 15, 2022 (Thursday), 17:30 - Aula Magna

Chair: Francisco Soullignac

Mercado Libre operates a transport network (MeliNet) to move every day hundreds of thousands of packages and products. At the daily Line Haul operation, short-term capacity planning is necessary to operate the shipping lanes in the network. In this context we introduce the operational fleet composition problem with stochastic demands (OFCP-SD). To tackle this problem at Mercado Libre scale we propose a two-stage stochastic programming formulation, in which the planned fleet size and mix decisions make up the first stage, while fix actions are taken in the second stage to hire extra vehicles or to make vehicle cancellations according to the observed demands. The hiring of extra vehicles implies additional costs, whereas the vehicle cancellations entail financial compensations. The objective is to minimize the fleet overall cost, which comprises the first-stage planned costs as well as the cost updates made by the fleet adjustments of the second-stage. To make the problem tractable, a demand forecasting procedure with an embedded scenario generation is devised. Furthermore, a variable fixation matheuristic is suggested for the OFCP-SD. A case study with extensive computational experiments is presented. The obtained results show the advantages of explicitly modeling the stochastic demands over a deterministic approach and underline the potential benefits to the business.

Closing ceremony

December 15, 2022 (Thursday), 18:30 - Aula Magna

Chair: Guillermo Durán
