



NEO 2021
9th International Workshop on
Numerical and Evolutionary Optimization
September 08-10, 2021



Schedule NEO 2021

Each session ends with a **Session Wrap Up**. Times are 20 minutes per talk, as well as for the wrap ups.

1 Day 1, September 08, 2021

Research Experience Day

9:15 – 9:30 Welcome to the RED

9:30 – 10:30 Postgrado, la puerta a las oportunidades.
Dr. Carlos Ignacio Hernández, IIMAS-UNAM

10:30 – 11:00 ¿Qué es la optimización y con qué se lleva bien? **Dra. Adriana Lara**, ESFM-IPN

11:00 – 11:30 Una introducción a las heurísticas. **Dra. Marcela Quiroz**, UV

11:30 – 12:00 Ingeniería con programación genética. **Dr. Leonardo Trujillo**, ITT

12:00 – 13:00 Discussion panel.

13:00 – 13:15 Closing

20:00 – 22:00 **Women at NEO**

2 Day 2, September 09, 2021

09:00 – 09:20 Opening

09:20 – 10:40 Keynote I: **Wolfgang Banzhaf**
Evolution Sometimes Needs Guidance

10:40 – 10:50 Coffee break

10:50 – 12:10 Sessions I and II (2 in parallel, 3 talks each)

12:10 – 12:20 Coffee break



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12:20 – 13:40 Sessions III and IV

14:40 – 15:00 Lunch break

15:00 – 16:20 Keynote II: **Gustavo Olague**

Brain Programming Vs. Neuroevolution Visiting the Old Fight Between Symbolic and Sub-symbolic Learning

16:20 – 16:30 Coffee break

16:30 – 17:50 Sessions V and VI

Session I: 10:50 – 12:10, Room 1, **Covid-19**

Chair: Nelson Rangel-Valdez

(ID 38) **Alejandro Castellanos-Alvarez, Laura Cruz, Hector Joaquin Fraire Huacuja, Claudia Gomez, José Alfredo Brambila-Hernández, Nelson Rangel-Valdez and Jesús M. Velásquez-Bermúdez.** A multi-objective optimization method to estimate parameters of the COVID SEIMR/R-S model with a case study of Mexico.

(ID 42) **Miriam Pescador Rojas, Víctor Adrián Sosa-Hernández, Víctor A. Sosa-Hernández and José L. Maravillas-Montero.** Explainable artificial intelligent model to determine the severity on COVID-19 patients.

(ID 28) **Angel Iram García Fernández, Nelson Rangel Valdez, Claudia Guadalupe Gómez Santillán, Héctor Joaquín Fraire Huacuja, Laura Cruz Reyes and María Lucila Morales Rodríguez.** Theoretical analysis of the application of a university timetable model in the optimization of hospital resources.

Session II: 10:50 – 12:10, Room 2, **Multi-objective Optimization**

Chair: Günter Rudolph

(ID 45) **Fernando Moreno Gómez and Adriana Lara López.** On the seek of an affordable solution to enhance Mexico City's air quality by optimized tree seeding.

(ID 19) **Cristian Sandoval, Oliver Cuate, Luis C. González, Leonardo Trujillo and Oliver Schütze.** Simple regression models for the rapid approximation of the hypervolume indicator for multiobjective optimization problems.

(ID 1) **Oliver Schütze and Carlos Hernández.** Archiving Strategies for multi-objective evolutionary algorithms.

Session III: 12:20 – 13:40, Room 1, **Circuits and ML I**

Chair: Gerardo de la Fraga



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(ID 27) **Luis Gerardo De La Fraga, Esteban Tlelo-Cuautle and Martín Alejandro Valencia-Ponce.** Chaotic Oscillators Implemented in FP16 Numbers.

(ID 18) **Anibal Sosa, Jhoan Delgado and Maria de Los Angeles González Lima.** Subsample algorithm for Support Vector Regression.

(ID 30) **Luis Gerardo De La Fraga.** Differential Evolution with Mixed Precision Numbers.

Session IV: 12:20 – 13:40, Room 2, Optimization in Industry 1

Chair: Oliver Cuate

(ID 20) **Alfonso Navarro-Espinoza, Oscar Roberto López-Bonilla, Enrique Efrén García-Guerrero, Esteban Tlelo-Cuautle, Didier López-Mancilla, Carlos Hernández-Mejía and Everardo Inzunza-González.** Traffic flow prediction for smart traffic lights.

(ID 21) **Edgar Rene Ramos-Acosta, Enrique Efrén García-Guerrero, Oscar Roberto López-Bonilla, Esteban Tlelo-Cuautle, Didier López-Mancilla, Carlos Hernández-Mejía and Everardo Inzunza-González.** Assembly components detection system based on convolutional neural networks: a case study.

(ID 15) **Javier Carmona, Josué Enríquez-Zárata, Armando Cárdenas, Daniel Hernández and Leonardo Trujillo.** Detection of wind turbine blade damage caused by insect erosion using AutoML methods.

Session V: 16:30 – 17:50, Room 1, Circuits and ML 2

Chair: Esteban Tlelo-Cuautle

(ID 43) **Gerardo de Jesús Martínez Neri, Luis Fortino Cisneros Sinencio, Juan Frausto Solis and Javier González Barbosa.** Computational methods for the design of transconductance operational amplifiers.

(ID 17) **Joel Nation, Leonardo Trujillo, Luis Muñoz and Edgar Galván.** Analysis of transfer learning in a genetic programming system using DeepInsight.

(ID 16) **Luis A Cardenas F, Daniel E Hernández, Leonardo Trujillo, Perla Juárez and Jose M. Muñoz.** Implementation of a stack-based genetic programming algorithm in CUDA.

Session VI: 16:30 – 17:50, Room 2, Discrete Optimization 1

Chair: Guadalupe Carmona

(ID 13) **Ricardo Pérez-Rodríguez.** A hybrid estimation of distribution algorithm for the quay crane scheduling problem.



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(ID 31) **Carlos Corpus, José Camacho and Víctor Blanco.** Un algoritmo co-evolutivo para el problema binivel de localización del árbol de hubs con fijación de precios.

(ID 35) **Diego Soto Monterrubio, Juan Paulo Sánchez-Hernández, Juan Frausto Solis and Javier González Barbosa.** Roulette selection strategies applied to GRSA2-SSP for refinement of the amino acid side chain regions.

3 Day 3, September 10, 2021

09:00 – 10:20 Keynote III: **Kenneth Sorensen**
A history of Metaheuristics

10:20 – 10:30 Coffee break

10:30 – 11:50 Sessions VII and VIII

11:50 – 12:00 Coffee break

12:00 – 13:20 Sessions IX and X

13:20 – 15:00 Lunch break

15:00 – 16:20 Keynote IV: **Carlos Segura**
Design of Population-based Optimizers: Diversity, Data Structures and Algorithms

16:20 – 16:30 Coffee break

16:30 – 17:50 Sessions XI and XII

17:50 – 18:00 Closing

Session VII: 10:30 – 11:50, Room 1, Women at NEO
Chair: Miriam Pescador

(ID 40) **Dalia Andra Rodriguez Ulloa, Arnoldo Díaz-Ramírez, Rafael Iván Ayala Figueroa, Leonardo Trujillo Reyes and Juan Pablo García Vázquez.** Addressing violence against women and children using IoT, AI, and serious games.

(ID 34) **Guadalupe Carmona Arroyo, Marcela Quiroz Castellanos and Efrén Mezura-Montes.** Variable decomposition for large-scale constrained optimization problems using a grouping genetic algorithm.



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(ID 41) **Miriam Pescador-Rojas, Erika Hernández-Rubio and Amilcar Mene-ses-Viveros.** Multi-objective evolutionary scheduling in heterogeneous parallel environments.

Session VIII: 10:30 – 11:50, Room 2, Optimization in Industry 2
Chair: Leonardo Trujillo

(ID 39) **Raymundo Juarez, Carmen Borrego, Gonzalo Maldonado and Amalio Ponce.** Crop yield and crop dates forecasting based on biometrical and weather variables: An artificial neural network approach.

(ID 24) **Arsenio Lizardi Durán, Guadalupe Castilla Valdez, Juan Frausto Solis and Juan Javier González Barbosa.** A hybrid method for solving Dynamic Job Shop Scheduling Problem.

(ID 26) **Oliver Cuate and Oliver Schütze.** The Pareto tracer for degenerated multi-objective optimization problems.

Session IX: 12:00 – 13:20, Room 1, Health
Chair: Esteban Tlelo-Cuautle

(ID 25) **Hans Yuan, Timothy Lam and Mauricio de Oliveira.** EMS-Simulator: an Open-Source Discrete-Event Simulation Framework for Medical Emergencies.

(ID 22) **Eduardo Enrique Contreras-Luján, Enrique Efrén García-Guerrero, Oscar Roberto López-Bonilla, Esteban Tlelo-Cuautle, Didier López-Mancilla and Everardo Inzunza-González.** Evaluation of machine-learning algorithms for early diagnosis of deep venous thrombosis.

(ID 23) **José Jaime Esqueda-Elizondo, J. Reyes Juárez-Ramírez, Oscar Roberto López-Bonilla, Enrique Efrén García-Guerrero, Gilberto Manuel Galindo-Aldana, Laura Jiménez-Beristáin, Alejandra Serrano-Trujillo, Esteban Tlelo-Cuautle and Everardo Inzunza-González.** Attention measurement of an ASD user using EEG signals: A case study.

Session X: 12:00 – 13:20, Room 2, Discrete Optimization 2
Chair: Guadalupe Carmona

(ID 44) **Edgar Galvan, Gavin Simpson, Haseena Sreedharan, Marcela Quiroz-Castellanos and Leonardo Trujillo.** Evolving the Upper Confidence Bounds for Trees in Monte Carlo Tree Search.

(ID 29) **Stephanie Amador Larrea, Marcela Quiroz Castellanos and Guillermo de Jesús Hoyos Rivera.** An Experimental Study of Grouping Crossover Operators for the Bin Packing Problem.



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(ID 36) **Jessica Elena Gonzalez San Martin, Laura Cruz-Reyes, Bernabe Dorronsoro, Marcela Quiroz-Castellanos, Héctor Fraire, Nelson Rangel-Valdez and Claudia Gómez-Santillán.** The dynamic bin packing optimization problem: open challenges.

Session XI: 16:30 – 17:50, Room 1, Circuits and ML 3
Chair: Gerardo de la Fraga

(ID 14) **Irving Rodriguez Hernández, Juan Frausto Solis, Javier Gonzalez Barbosa, Luis Fortino Cisneros Sinencio and José Luis Purata Aldaz.** GA-DRL: Portfolio selection and deep reinforcement learning agent for daily stock trading.

(ID 32) **Natan Vilchis and Adriana Lara.** A multi-objective approach to deal with emotions in computer-aided musical composition.

Session XII: 16:30 – 17:50, Room 2, Discrete Optimization 3
Chair: Marcela Quiroz

(ID 33) **José-Fernando Camacho-Vallejo, Sahori Polino and Juan G. Villegas.** An algorithm based in the Path Relinking metaheuristic for solving a location bilevel problem; an application to a social responsibility project.

(ID 37) **Citlalli Morales de la Cruz, Laura Cruz-Reyes, Rafael Alejandro Espín-Andrade, José Fernando Padrón-Tristán and Claudia Guadalupe Gómez-Santillán.** Genetic Knowledge Discovery Algorithm Based on Archimedean-Compensatory Fuzzy Logic.