

Preface

The large variety of heuristic algorithms for hard optimization problems raises numerous interesting and challenging issues. Practitioners are confronted with the burden of selecting the most appropriate method, in many cases through an expensive algorithm configuration and parameter tuning process, and subject to a steep learning curve. Scientists seek theoretical insights and demand a sound experimental methodology for evaluating algorithms and assessing strengths and weaknesses. A necessary prerequisite for this effort is a clear separation between the algorithm and the experimenter, who, in too many cases, is “in the loop” as a crucial intelligent learning component. Both issues are related to designing and engineering ways of “learning” about the performance of different techniques, and ways of using past experience about the algorithm behavior to improve performance in the future. This is the scope of the Learning and Intelligent OptimizationN (LION) conference series.

This volume contains papers presented at the 9th LION (Learning and Intelligent OptimizationN) conference held during January 12–15, 2015 in Lille, France.

This meeting, which continues the successful series of LION events (see LION 5 in Rome–Italy, LION 6 in Paris–France, LION 7 in Catania–Italy, and LION 8 in Gainesville–USA), is exploring the intersections and uncharted territories between machine learning, artificial intelligence, mathematical programming, and algorithms for hard optimization problems. The main purpose of the event is to bring together experts from these areas to discuss new ideas and methods, challenges and opportunities in various application areas, general trends, and specific developments. Optimization and machine learning researchers are now forming their own community and identity. The International Conference on Learning and Optimization is proud to be the premiere conference in the area.

A total of 58 papers were submitted to LION 9: 43 submissions of long papers and 15 submissions of short papers. Each manuscript was independently reviewed by at least three members of the Program Committee. 14 long papers and 17 short papers were accepted (some long submissions have been asked to be shortened). Hence, the selection rate for long papers is of 33 %.

During the conference, we were pleased to listen to four plenary speakers:

- **David Corne**, Heriot-Watt University, UK. *Psychic machines: mind-reading with machine learning*
- **Alex Freitas**, University of Kent, UK. *Automating the Design of Decision Tree Algorithms with Evolutionary Computation*
- **Daniel Le Berre**, Artois University, Lens, France. *From Boolean Satisfaction to Boolean Optimization: Application to Dependency Management*
- **Remi Munos**, Inria Lille Nord Europe, France. *The optimistic principle applied to function optimization and planning*

In addition, two tutorials were presented:

- **Thomas Stützle**, FNRS-IRIDIA, ULB, Belgium. *Automatic Algorithm Configuration: From Parameter Tuning to Automatic Design*
- **Sébastien Verel**, Littoral Côte d’Opale University, Calais, France. *Fitness landscape: the metaphor and beyond*

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