

EVOLVE 2011

A bridge between Probability, Set Oriented Numerics and Evolutionary Computation

May 25-27 (Wednesday-Friday), 2011, Bourglinster Castle, Luxembourg

<http://evolve.uni.lu>

Workshop organized by:

University of Luxembourg, CINVESTAV Mexico, INRIA France

Partners:

Computer Science and Communications Research Unit
Interdisciplinary Centre for Security Reliability and Trust
Association Evolution Artificielle, France

The aim of the EVOLVE workshop is to build a bridge between probability, statistics, set oriented numerics and evolutionary computing, in order to identify new common and challenging research aspects. EVOLVE is thus intended to unify theory-inspired methods and cutting-edge techniques ensuring performance guarantee factors. By gathering researchers with different backgrounds, ranging from computer science to mathematics, statistics and physics, to name just a few, a unified view and vocabulary can emerge where the theoretical advancements may echo in different domains.

The massive use and large applicability spectrum of evolutionary algorithms for real-life applications determined a need for establishing solid theoretical grounds. Only to offer a few examples, one may consider mathematical objects that are sometimes difficult and/or costly to calculate. At the same time, acknowledged new results show that evolutionary computation can provide in some cases good and fast estimators of these quantities. Similarly, the handling of large quantities of data may require the use of distributed environments where the probability of failure and the stability of the algorithms may need to be addressed. What is more, common practice confirms in many cases that theory based results have the advantage of ensuring performance guarantee factors for evolutionary algorithms in areas as diverse as optimization, bio-informatics or robotics.

Summarizing, this workshop focuses on challenging aspects arising at the passage from theory to new paradigms and aims to provide a unified view while raising questions related to reliability, performance guarantees and modeling.

The EVOLVE 2011 workshop represents a follow-up of the Workshop on Evolutionary Algorithms - New Challenges in Theory and Practice, organized by the ALEA Working Group in Bordeaux, France, March 2010.

Topics of interest

- bridge between probability, statistics and evolutionary algorithms
- performance guarantee factors for large scale / highly multi-modal optimization problems
- performance guarantees measures for existing algorithms
- estimation of complete distribution laws

- Gibbs measures
- set oriented numerics
- robust methods for large scale, high dimensional problems
- theoretical tools, components that ensure the robustness in practice
- theoretical foundations
- mathematical objects and evolutionary programming
- robust / fast estimation of mathematical quantities
- particle methods, Markov Chain Monte Carlo methods
- spatial complexity of methods and its implications in practice
- robustness of parallel and distributed evolutionary optimization
- self-tuning and self-adaptive techniques based on theoretical analysis
- particular issues (e.g. landscape analysis, complex networks)
- swarm intelligence

Keynote speakers

Enrique Alba	University of Málaga, Spain
Carlos A. Coello Coello	Department of Computer Science, CINVESTAV-IPN, México
Pierre Del Moral	INRIA Bordeaux - Sud Ouest, France
Michael Dellnitz	Institute for Mathematics, University of Paderborn, Germany
Frédéric Guinand	University of Le Havre, France
Günter Rudolph	TU Dortmund University, Germany
Marc Schoenauer	INRIA Saclay - Île-de-France, France
Franciszek Seredynski	Polish Academy of Sciences, Warsaw, Poland
El-Ghazali Talbi	Polytech' Lille, University of Lille 1, France
Marco Tomassini	University of Lausanne, Switzerland
Massimiliano Vasile	Space Advanced Research, University of Glasgow, Scotland

EVOLVE 2011 is organized by Alexandru-Adrian Tantar, Emilia Tantar, Pascal Bouvry (University of Luxembourg), in collaboration with Oliver Schütze (CINVESTAV, Mexico), Pierre Del Moral and Pierrick Legrand (INRIA, France).

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Website: <http://evolve.uni.lu>

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