sicsa*
The Scottish Informatics & Computer Science Alliance

Self-Adaptive Emergent Autonomous Bio-Inspired Systems Workshop Series

CALL FOR PARTICIPATION

Register @ http://seabis-workshop.eventbrite.com
11.30-16.45, Wednesday 1st May 2013
Room 2A73, Cottrell Building
University of Stirling, Stirling FK9 4LA

All SEABIS researchers are warmly invited to attend the second in the series of three workshops in the SEABIS subtheme. Each workshop will consist of a keynote talk, a poster session presenting current ideas from SEABIS researchers and a panel session discussion on research trends in SEABIS areas. We invite posters for this workshop, which will take place at the University of Stirling on 1st May 2013. PhD students are particularly welcome to contribute. All topics in the SEABIS scope are relevant including, but not limited to: *Evolutionary algorithms, Hyper-heuristics, Self-adaptive Systems, Machine Learning, Particle Swarm Optimisation, Ant Colony Optimisation, Artificial Immune Systems, Artificial Life, Theory and Applications.*

PROGRAMME

11:30 – 12:30	Registration and Refreshments
12:30 – 13:30	Prof. Frédéric Saubion, University of Angers, France, *"Autonomous Search for Combinatorial Optimization"*
13:30 – 14:30	LUNCH*
14:30 – 15:30	Poster Session
15:30 – 15:45	Refreshment Break
15:45 – 16:45	Panel Discussion: "*The Interplay between Optimisation and Machine Learning"*
16:45	CLOSE

* If you have special dietary requirements, please email them to Dr. David Cairns dec@cs.stir.ac.uk before the event

Submissions will be received up to Monday 29th April. Please email an abstract up to a maximum of 300 words to Dr. Gabriela Ochoa (goc@cs.stir.ac.uk). All abstracts will be available on the day and circulated to the SEABIS mailing list after the workshop. "Work-in-progress" ideas are welcome as is fully-developed work. Posters should be no larger than A1.

“Autonomous Search for Combinatorial Optimization”

Prof. Frédéric Saubion, University of Angers, Angers, France

Decades of innovation in combinatorial problem solving have produced better and more complex algorithms. These new methods are better since they can solve larger problems and address new application domains. They are also more complex, which means that they are hard to reproduce and often harder to fine tune to the peculiarities of a given problem. This last point has created a paradox where efficient tools became out of reach for practitioners.

Autonomous search represents a new research field defined to precisely address the above challenge. Its major strength and originality consist in the fact that problem solvers can now perform self-improvement operations based on analysis of the performances of the solving process -- including short-term reactive reconfiguration and long-term improvement through self-analysis of the performance, offline tuning and online control, and adaptive control and supervised control. Autonomous search "crosses the chasm" and provides engineers and practitioners with systems that are able to autonomously self-tune their performance while effectively solving problems.

In this talk, we review existing work and we attempt to classify the different paradigms that have been proposed during past years to build more autonomous solvers. We also draw some perspectives and future directions.

Frédéric Saubion is professor at the University of Angers, Vice dean of the Faculty of Sciences and member of the French National University Council for Computer Science. His research interests are on combinatorial optimization and evolutionary computation, namely: the design of an evolutionary algorithm (GASAT) for the SAT problem, autonomous search, with on-line parameters control for metaheuristics algorithms, the design of hybrid solvers for CSPs: local search and memetic approaches, and optimization techniques for the characterization of biological data or for information retrieval. Some significant publications are listed below:

Y. Hamadi, E. Monfroy and F. Saubion Eds, Autonomous Search, Springer, 2012.

T. Boureau, M. Kerkoud, F. Chhel, G. Hunault, A. Darrasse, C. Brin, K. Durand, A. Hajri, S. Poussier, C. Manceau, F. Lardeux, F. Saubion and M.-A. Jacques : A multiplex- PCR assay for identification of the quarantine plant pathogen Xanthomonasaxonopodi , pv. phaseoli, *Journal of Microbiological Methods*, Volume 92, Number 1, pp 42-50, Elsevier, 2013

J.Maturana, F.Lardeux, F.Saubion: Autonomous operator management fo revolutionary algorithms. *Journal of Heuristics* 16(6): 881-909, Springer, 2010.

S.Lamprier,T.Amghar,B.Levrat,F.Saubion: SegGen: A Genetic Algorithm for Linear Text Segmentation. International Joint Conference on Artificial Intelligence IJCAI : 1647-1652, 2007

F. Lardeux, F. Saubion, JK. Hao: GASAT: A Genetic Local Search Algorithm for the Satisfiability Problem. Evolutionary Computation 14(2): 223-253 (2006)