REPORT ON UCNC 2012
THE 11TH INTERNATIONAL CONFERENCE ON UNCONVENTIONAL COMPUTATION AND NATURAL COMPUTATION

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Prior to 2012, this conference series was known as Unconventional Computation (UC); this year the name changed to UCNC, reflecting the close link between the two disciplines.

The 11th International Conference on Unconventional Computation and Natural Computation (UC 2012) took place at the University of Orléans, France, 3–7 September 2012. It was organised by the Laboratoire d'Informatique Fondamentale d'Orléans and was held at the computer science building on the campus of *La Source* of the Université d'Orléans. The conference received support from: LIFO, the Laboratoire d'Informatique Fondamentale d'Orléans; the University of Orléans; the City of Orléans; Conseil Général du Loiret; Région Centre; GdR Informatique et Mathématiques; CNRS; Inria.

The fully international complement of authors came from all parts of the globe: Austria, Canada, Colombia, France, Germany, Hungary, Iran, Ireland, Italy, Japan, Moldova, Netherlands. New Zealand, Norway, Poland, Romania, South Korea, Spain, Sweden, UK, and USA.

The invited plenary session speakers (in alphabetical order) and their talk titles were: Paola Bonizzoni (University of Milano-Bicocca, Italy) "The Holy Grail: Finding the Genetic Bases of Phenotypic Characters"; Cristian S. Calude (University of Auckland, New Zealand) "Inductive Complexity of P versus NP Problem"; René Doursat (GEB, Universidad de Málaga, Spain) "Advances in Embryomorphic Engineering"; Jack Lutz (Iowa State University, USA) "Finite State Dimensions" (in a change to the advertised title); Maurice Margenstern (Université de Lorraine, France) "Universality and the Halting Problem for Cellular Automata in Hyperbolic Spaces: The Side of the Halting Problem".

There were two extended tutorials, each comprising three 1 hour sessions. "MGS

and Spatial Computing", by Jean-Louis Giavitto (IRCAM, Paris, France) and Olivier Michel, Antoine Spicher (LACL, Université de Paris Est – Créteil, France) was an in-depth introduction to their topological programming paradigm, including the underlying mathematical concepts, the language, and applications from morphogenesis to music. "An Introduction to Tile-Based Self-assembly" by Matthew Patitz (University of Arkansas, USA) was a detailed look at a wide range of results from two dimensional tiling theory and self-assembly of DNA tiles.

The full conference comprised these plenaries and tutorials, together with the scientific programme of technical presentations of the published papers, and a poster session where the authors had the opportunity to make a short informal presentation of their work.

Proceedings of UCNC 2012 are published in the Springer series as LNCS volume 7445 (ISBN 978-3-642-32893-0). The volume contains abstracts and extended abstracts of the invited papers and tutorials, 14 refereed 12 page full papers, and 6 poster paper abstracts.

In association with the main technical conference, there were four parallel associated workshops on related unconventional topics: 5th International workshop on Complex Systems Modelling and Simulation (CoSMoS 2012); 2nd COBRA workshop on Biological and Chemical Information Technologies (BioChemIT 2012); 1st International Workshop on Information Physics and Computing in Nano-scale Photonics and Materials (IPCN 2012); 2nd Workshop on Foundations of Quantum Information (FounQI 2).

In addition, Gilles Dowek (INRIA, Paris, France) gave a public lecture as part of the Turing Centenary celebrations. He spoke on "A Two-Dimensional Programming Language for Two-Dimensional Data". Over the course of a fascinating hour, he gradually built up a Universal Turing Machine in a simple two dimensional graphical language, in a way that made it crystal clear how UTMs work.

Because of the parallel conference and workshop sessions, I attended only a selection of the presentations. Particular highlights for me, in addition to Dowek's talk, include the following, both on morphogenesis, one of my interests.

René Doursat's plenary on Embryomorphic Engineering covered a wide range of issues in complex systems, emergence, self-organisation, and morphogenesis, building up to the denouement: engineering the evolution of computational "seeds", and the growth from these seeds, of complex ALife systems.

Jean-Louis Giavitto and Antoine Spicher's MGS tutorial demonstrated an extremely elegant approach to unifying many of the different kinds of rewriting

systems that form a sub-branch of unconventional computation. It provides a topological approach to a range of dynamical systems, getting a grip on "dynamical systems with dynamical structure", essential for modelling, simulating and engineering morphogenesis.

The social programme allowed a choice: canoeing on the Loire, or a visit to the Château de Chambord. I chose the latter. A visit to Chambord is a marvellous experience, particularly in the fine weather that we enjoyed. We were introduced to the magnificent architecture and its accompanying history by an enthusiastic and articulate guide; afterwards, I researched a couple of the stories she had told, and discovered that they might have been slightly exaggerated! We returned to Orléans for a walking tour of the city, which has many impressive buildings and many excellent statues of Jeanne d'Arc. After the afternoon excursions, the two groups the met up for the conference dinner.

Many thanks for an excellent event go to the local organisers: Florent Becker (local chair), Jérôme Durand-Lose, Bastien Le Gloannec, Mathieu Liedloff, Nicolas Ollinger, Anthony Perez, and Maxime Senot.

Next year's UCNC takes place 1–5 July 2013, in Milan, Italy.