Report on LiCS 2016

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A sweltering New York city welcomed participants of the thirty-first ACM/IEEE symposium on Logic in Computer Science (LiCS 2016), held July 5–8. Those who flew in a day earlier got to enjoy the 4th of July fireworks. The conference took place on the campus of Columbia University, in the leafy part of western Harlem between the north-western corner of Central Park and the Hudson river.

2016 has been an eventful year; Brexit, Trump and all. It's therefore fitting that also LiCS '16 was stranger than usual. The organisers were not formally associated with Columbia, and as a result our presence on its grandiose Ivy league campus—a gilded alumni/donor luncheon land sprouting Ionic columns and enormous classical bronze statues in every corner—sometimes felt like a not entirely welcome invasion of our ragtag community of logicians, mathematicians and computer scientists.

The large team of friendly and enthusiastic t-shirted student helpers did their best to combat an eccentrically subdivided programme, changing timetables, changing rooms and lunch breaks that were not quite long enough to walk to the restaurant quarter, ten blocks down Amsterdam Avenue. Nonetheless, the scientific programme was enjoyable and rewarding.

First, the awards: Steen Vester, from the Technical University of Denmark, won the Kleene best student paper award for "Winning Cores in Parity Land", while the Test-of-Time award went to two very influential papers from LiCS '96 (which, coincidentally, was held in New Brunswick, New Jersey, just an hour's drive south-west from Columbia). The papers were: (1) "General Decidability Theorems for Infinite-State Systems" by Parosh Abdulla, Karlis Cerans, Bengt Jonsson and Yih-Kuen Tsay, now a standard reference for well-structured transition systems, and (2) "A Linear Logical Framework" by Iliano Cervesato and Frank Pfenning, one of the first efforts at combining linear logic with dependent types.

Back to 2016. There were four invited talks. Pedro Domingos gave an overview of Markov logic and its applications. Joost-Pieter Katoen gave a comprehensive overview of probabilistic model-checking. Mai Gehrke gave a weighty tutorial about her work on dualities in computer science, at the intersection of algebra and language theory. Finally, Maurice Herlihy gave a fascinating talk about blockchains, an implementation of distributed ledgers famous through its use in Bitcoin. Herlihy's talk was a call to arms for more formally minded computer scientists: almost none of the work on blockchains has been formally verified (or even specified!) meaning that the implementations are the specs and billions of dollars are on the line. It is a rather embarrassing situation. Without doubt, this is a research area that will grow in importance over the coming years.

There were plenty of high-quality contributed talks in traditional LiCS areas such as computability, proof theory, language theory, semantics and verification. The growth

in research in probabilistic and quantitative computation continued with a number of strong papers; in particular "Quantitative Algebraic Reasoning" by Radu Mardare, Prakash Panangaden and Gordon Plotkin looks like a strong contender for the LiCS '26 Test-of-Time award (I'll go out on a limb and predict that it will be held in Stamford, Connecticut, an hour or so north-east from New York). On a personal note, it was nice to see a number of papers using the algebra of monoidal categories in various fields, including logic, systems theory and quantum information; the connection between them is a string diagrammatic notation that elegantly exposes the similarities in the underlying algebraic/coalgebraic equational theories.

My favourite contributed presentation was "On Thin Air Reads: Towards an Event Structures Model of Relaxed Memory", given by Alan Jeffrey and James Riely, shining the structuralist light of event structures on the confusing menagerie of exotic weak memory models. The talk was a joy to experience: Jeffrey and Riely delivered it a hybrid style, somewhere between Socratic dialogue and experimental theatre. The audience felt as if they were themselves involved in doing the research. It was an exceptionally effective presentation and during the questions session after the talk, Dexter Kozen asked if they had considered adapting it for Broadway.

At the end of the first day—and prior to a rather posh reception—there was a discussion on the history of LiCS, with a number of stalwarts reminiscing about the pioneer days of the first few editions. Valeria de Paiva also raised the challenges posed by the worryingly low percentage of women in the community. One practical step on the way to a solution was the excellent Logic Mentoring Workshop, a new satellite event organised by Stephen Magill and Alexandra Silva. The audience were students, including undergraduates, with a very healthy gender balance: surely a tribute to the organisers' efforts. A number of experienced scientists gave mentoring presentations and the workshop finished with a very lively panel session where students quizzed the panel participants about topics as diverse as what to do if you can't get along with your supervisor, and how to tell when a piece of research is ready for publication. I hope that this workshop establishes itself as a regular part of the LiCS calendar.