General Algebra and its Applications 2013

La Trobe University, Melbourne

15–19 July 2013

Marcel Jackson*

Summary

This workshop and conference was built around the celebration of the retirement and 65th birthday of eminent Australian algebraist Professor Brian Davey. It was the first major international event in the area of universal algebra (also known as general algebra) to be held in Australia. The themes are based around interactions of universal algebra with disciplines such as semigroup theory, logic and computer science. In particular, universal algebraic tools have been very successful in classifying the complexity of constraint satisfaction problems, and contributions to this were a particular focus. The list of invited speakers includes the world leaders in these connections.

Organising committee

- Marcel Jackson (La Trobe University), Chair
- James East (University of Western Sydney)
- Tomasz Kowalski (La Trobe University)
- George McNulty (University of South Carolina)
- Todd Niven (La Trobe University, Monash University)

Topics covered

Universal algebra, semigroup theory, ring theory, computational mathematics, algebraic methods in constraint problems, theoretical computer science, category theory.

Special presenters

- Libor Barto (Charles University in Prague)
- Andrei Bulatov (Simon Fraser University)
- David Clark (SUNY New Paltz)
- Igor Dolinka (University of Novi Sad)
- Peter Jipsen (Chapman University)
- Marcin Kozik (Jagiellonian University)
- Andrei Krokhin (Durham University)
- Miklos Maroti (Bolyai Institute, Szeged)
- Ralph McKenzie (Vanderbilt University)
- Hilary Priestley (Oxford University)

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- Mikhail Volkov (Ural Federal University)
- Ross Willard (University of Waterloo)

Full-length talks were also given by Brian Davey, and by George McNulty.

Report

The event *General Algebra and Its Applications* (GAIA2013) took place at La Trobe University's Franklin Street city campus over the five days 15–19 July 2013. This event was supported financially by La Trobe University, AMSI and the Australian Mathematical Society, and celebrated Brian Davey's retirement and 65th birthday. Fittingly, there were exactly 65 successfully registered participants, 46 of whom were international participants, visiting from 20 countries covering Asia, Europe, North America and Africa.

The event included 14 longer plenary workshop talks giving overviews and big-picture synopses of current research in a range of fields in and around universal algebra. Amongst the topics covered were

- duality theory,
- axiomatisability and equational logic,
- Maltsev conditions,
- semigroups and idempotents,
- evolutionary computing and universal algebra,
- complexity of constraint satisfaction problems, and other constraint-based computational problems,
- computational mathematics in universal algebra.

Accompanying the 14 longer talks, were a further 28 shorter contributed talks, again demonstrating a breadth of research in universal algebra, orders and lattices, semigroup theory, ring theory, category theory, computational mathematics, logic interactions, and theoretical computer science. One highlight was the announcement of a major new contribution toward the resolution of a cherished

theory problem in universal algebra (the Park-Jónsson problem). This, along with history and proof overview, was the content of Willard's talk: the proof itself was finalised only days before the start of GAIA2013.

The program also included a problem workshop which was held during Tuesday lunchtime. This two-hour session was aimed at the presentation and discussion of unsolved problems and ideas that might reasonably serve as future research directions for postgraduate students and early career researchers.

Brian Davey has written numerous songs at and about algebra conferences, and many students and colleagues have enjoyed and/or endured singing sessions at meetings and seminars. GAIA2013 was no exception, with 23 limerick verses written by Brian and other participants and performed in an epic close to the event.

A special issue of the journal *Algebra Universalis* has been attached to GAIA2013. The issue is open to general submissions in honour of Brian Davey, but will accommodate the breadth of research covered in GAIA2013. The problem list created during the problem workshop will also be included in this issue.

Organisers' opinion of success

The original funding application estimated budget on the basis of 40 participants including invited speakers, 12 either AustMS members or from AMSI institutions and 6 students. In the end there were 65 genuine registrants, 19 AustMS or AMSI members and 13 students. One registrant did not physically attend due to worsening illness, but paid registration, and was scheduled to present via Skype, health permitting. This participant was sent the conference booklet and bag as well as a get-well-soon card signed by the physically attending participants.

The large number of registrants forced the five-day event to include parallel sessions, which we had originally hoped to avoid. Nevertheless, we were able to maintain a breadth of content that ensured good attendance within parallel sessions.

Aside from the resounding success in registration numbers, the conference had a great feel, with a number of participants indicating an enthusiasm for further conferences in the future or for future visits. Both the organising team, and the birthday celebrator were extremely happy with the event.