REPORT ON OPCT 2014

Bertinoro Research Seminar on
Open Problems in Concurrency Theory

`http://opct2014.cs.vu.nl/`

Marco Bernardo   Daniel Gebler   Michele Loreti
U. Urbino, IT   V.U. Amsterdam, NL   U. Firenze, IT

The research seminar on Open Problems in Concurrency Theory (OPCT 2014) was held on 18-21 June 2014 in the Fresco Room of the University Residential Center of Bertinoro, Italy, and was co-sponsored by the IFIP Working Group 1.8. The aim of this research seminar was that of identifying the most important open problems in the area of concurrency theory through the invited contributions of a mix of senior and younger researchers working in the field.

OPCT 2014 is the most recent in a series of events related to concurrency theory that took place in Bertinoro in the last fifteen years:

- In July 2001 Marco Bernardo, Roberto Gorrieri, and Scott Smolka organized the first "International School on Formal Methods for the Design of Computer, Communication and Software Systems" (SFM-01:PA), which was specifically devoted to process algebra on the occasion of the publication of the "Handbook of Process Algebra" edited by Jan Bergstra, Alban Ponse, and Scott Smolka.

- In July 2003 Luca Aceto, Zoltán Ésik, Wan Fokkink, and Anna Ingólfsdóttir organized a workshop entitled "Process Algebra: Open Problems and Future Directions", which can be considered as the first ancestor of OPCT.

- In August 2005 Luca Aceto, Mario Bravetti, Jim Davies, Wan Fokkink, Andrew Gordon, Joost-Pieter Katoen, Faron Moller, and Steve Schneider organized a workshop on "Algebraic Process Calculi: The First Twenty Five Years and Beyond" (APC 25) to celebrate the first twenty five years of research after the publication of Robin Milner's first book on the Calculus of Communicating Systems.

The proposal of organizing OPCT 2014 was made by Marco Bernardo, Daniel Gebler, and Michele Loreti in August 2013 during the business meeting of the IFIP WG 1.8 held in Buenos Aires, Argentina, after the CONCUR conference. The proposal was gladly accepted by all the people present at the meeting, including the former chair Jos Baeten and the current chair Ilaria Castellani.

The invitation process started in November 2013. The three organizers invited:

- All the 55 present and past members of the IFIP WG 1.8.

- The 3 present and past members of the steering committee of the CONCUR conference who are not members of the IFIP WG 1.8.

- The 30 present and past chairs of the programme committee of the twenty five editions of the CONCUR conference held so far, who are members of neither the IFIP WG 1.8, nor the steering committee of CONCUR.

- 33 additional researchers in concurrency theory.

The 121 invitees replied as follows:

- 44 were willing to give a talk.

- 8 were only interested in attending.

- 9 were willing to speak/participate, but could not come in the end.

- 27 declined the invitation.

- 33 did not respond.

In April 2014 a call for participation was posted to the concurrency mailing list in order to attract further people interested in the event. Overall, there was a total of 59 attendees (44 speakers, 12 participants, 3 organizers) with the following distribution by affiliation country:

- 17 from Italy.

- 8 from the Netherlands and the United Kingdom.

- 6 from France.

- 5 from Denmark.

- 3 from Germany.

- 2 from Argentina and Sweden.

- 1 from Australia, Austria, Cyprus, Czech Republic, Iceland, Ireland, Portugal, and Spain.

During the four days of the research seminar, there were 44 talks of 30 minutes each, divided into 14 sessions of 3 talks each, plus 1 session of 2 talks. From a thematic viewpoint, based on the topics proposed by the invitees the 15 sessions gave rise to the following five tracks:

- Process Theory, Expressiveness, and Programming Languages (8 sessions).

- Quantitative Aspects in Concurrency Theory (3 sessions).

- Verification, Testing, and Synthesis (2 sessions).

- Types in Concurrency Theory (1 session).

- Security in Concurrency Theory (1 session).

The 44 presentations, which are available at `http://opct2014.cs.vu.nl/`, were all well attended and provided an excellent account of both open problems and ongoing research in concurrency theory. Some talks raised a lot of questions from the audience and fostered lively discussions among people; this witnesses the enduring interest and enthusiasm within the concurrency theory community.

Most attendees were accommodated in the beautiful setting of the University Residential Center of Bertinoro, where breakfast, coffee breaks, and lunches were also served; a few people had to stay in a couple of hotels located in Bertinoro and Fratta Terme. The social dinner, kindly offered by the University Residential Center, took place on the evening of June 19 at Ristorante Altopalato.

In addition to the present report for the Bulletin of EATCS, a special issue of the Journal of Logical and Algebraic Methods in Programming was planned, which is devoted to the themes of OPCT 2014 and is open to researchers who did not attend the seminar (submission deadline: 15 November 2014).

Finally, the participants recognized the need of establishing a means for making easily accessible the large body of knowledge in concurrency theory that has been developed over more than 30 years – something which may be called ConcurPedia – as well as for sharing information and promoting collaboration on open problems, challenges, and new directions.