

Report on FSCD 2016: 1st International Conference on Formal Structures for Computation and Deduction

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The 1st International Conference on Formal Structures for Computation and Deduction (FSCD 2016), took place on June 22-26, at the University of Porto, Portugal. The new FSCD conference stemmed from the former RTA (Rewriting Techniques and Applications) and TLCA (Typed Lambda Calculi and Applications) conferences. These well established conferences had been collaborating since 2003, by having collocated meetings as the joint RDP conference. Considering the evolution of the original scopes of the two conferences, and the significant and growing overlap of their research areas, it was the decision of the RTA and TLCA communities to present this new conference. FSCD has inherited its name from an unpublished book by Gérard Huet, which influenced many researchers in the area.

The chosen location for the inaugural meeting of the FSCD conference was the lovely city of Porto, the second largest city in Portugal and one of the most beautiful in Europe. The city dates back to the IV century having its historic centre classified as *World Heritage Patrimony* by UNESCO since 1996. Its unique landscape, built along the hill-sides overlooking the mouth of the Douro River, forms a perfect combination of road layouts, houses and the river. The diversity of civil and religious architecture bears testimony to a historic centre dating back to Roman, Medieval, Renaissance, Baroque and Neoclassical times. The city gives its name to the worldwide renowned Port Wine.

The event was hosted by the University of Porto, at the Department of Computer Science, which is part of the Faculty of Sciences (a major school within the University of Porto). The Faculty of Sciences shares the University of Porto commitment to high-quality research and teaching, spanning Mathematics, Physics, Chemistry, Biology, Geology, Computer Science and their applications. The school also supports a strong commitment to postgraduate training. The Department of Computer Science was responsible for the organization of the event, in collaboration with three of its associate research centers: CMUP (Center for Mathematics of the University of Porto), CRACS (Center for Research in Advanced Computing Systems) and LIACC (Artificial Intelligence and Computer Science Laboratory). The organisation also involved researchers from the Department of Mathematics of the University of Minho. This event was organised in cooperation with ACM SIGPLAN and ACM SIGLOG. The event also enjoyed the sponsorship of the University of Porto Rectory and of TWO SIGMA Investments.

The 5-day event included the main FSCD conference as well as an impressive number of 11 satellite events, attracting a total of 186 participants. This included the 4 FSCD invited speakers, around 20 workshop invited speakers, 9 organisers, and 21 workshop organisers. The 11 collocated workshops, held over three days (two of which

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Fig. 1. FSCD 2016 group photo

overlapping with the main conference), received a total of 60 (workshop only) registrations. By comparison, the last RDP conference had a total of 157 participants, which was already higher than most previous editions of the joint conference.

With respect to the number of satellite events, there was also a considerable increase in the number of workshops, as well as in the variety of the covered topics. The list of events included workshops that have traditionally been collocated with the previous RTA/TLCA conferences, but also workshops that decided to join the conference for its first edition:

- CL&C: 6th Workshop on Classical Logic and Computation (PC Chair: Ulrich Kohlenbach);
- HDRA: 2nd Workshop on Higher-Dimensional Rewriting and Applications (PC Co-chairs: Yves Guiraud, Philippe Malbos and Samuel Mimram);
- HOR: 8th Workshop on Higher-Order Rewriting (PC Chair: Jakob Grue Simonsen);
- HoTT/UF: 2nd Workshop on Homotopy Type Theory/Univalent Foundations (Organisers: Peter LeFanu Lumsdaine and Nicolas Tabareau);
- IFIP Working Group 1.6: Term Rewriting (Organiser: Georg Moser);
- ITRS: 8th Workshop on Intersection Types and Related Systems (PC Chair: Naoki Kobayashi);
- LFMTP: 18th Workshop on Logical Frameworks and Meta-Languages: Theory and Practice (PC Co-chairs: Gilles Dowek and Dan Licata);
- LSFA: 11th Logical and Semantic Frameworks with Applications (Organisers: Vivek Nigam, Mário Florido and Daniele Nantes Sobrinho);
- Linearity: 4th Workshop on Linearity (PC Co-chairs: Iliano Cervesato and Maribel Fernández);
- UNIF: 30th Workshop on Unification (PC Co-chairs: Silvio Ghilardi and Manfred Schmidt-Schauss);
- WPTE: 3rd Workshop on Rewriting Techniques for Program Transformation and Evaluation (PC Co-chairs: Horatiu Cirstea, Santiago Escobar and Naoki Nishida).

The number/variety of workshops was a key aspect in attracting participants worldwide. In particular, it was the first edition of the well-established International Workshop on Logical and Semantic Frameworks with Applications (LSFA) to take place outside Brazil, attracting a fair amount of participants from South America.

The scientific programme of the main conference was excellently assembled by the two PC chairs Delia Kesner from the University Paris-Diderot and Brigitte Pientka from McGill University in Montreal. The PC received a total of 82 submissions, com-

prising 77 full papers and 5 systems descriptions, of which 28 papers and 4 system descriptions were accepted (yielding an acceptance rate of 39%). The programme was enriched by the participation of four excellent invited speakers:

- Amal Ahmed (Northeastern University)
- Tobias Nipkow (Technical University Munich)
- Ichiro Hasuo (University of Tokyo)
- Gérard Huet (INRIA Paris Center)

The quick-off of the conference was given by Brigitte Pientka, who introduced the first ever invited speaker of FSCD, Amal Ahmed. Her talk explored the challenges in compiler verification in today's world of multi-language software, by focusing on the interoperability between high-level and low-level components. The second day of the conference started with Tobias Nipkow's talk on the verification/analysis of classical data structures in a functional setting. Ichiro Hasuo opened the third day of the conference with a talk on his recent work exploiting results from the theory of coalgebra, in the context of Girard's geometry of interaction. On the last day of the main conference, Gérard Huet shared his lifelong experiments in teaching fundamentals of computation and deduction, and how the elaboration of course notes following a literate programming and proving style has led to the discovery of fundamental results.

Two contributed papers were selected by the PC as "Best Paper": *Environmental bisimulations for delimited-control operators with dynamic prompt generation*, by Andrés Aristizábal, Dariusz Biernacki, Serguei Lenglet and Piotr Polesiuk ; and "Best Student Paper": *Formal languages, formally and coinductively*, by Dmitriy Traytel. During the conference it was also announced that selected papers from FSCD 2016 would be invited to a special issue of the open-access journal Logical Methods in Computer Science (LMCS). The last session of the main conference was devoted to the Business Meeting, where the two next editions of FSCD were discussed. In 2017, FSCD will take place in Oxford, 3-6 September (co-located with ICFP). The chair of the PC will be Dale Miller and Sam Staton will be the Conference Chair. FSCD 2018 will be a member conference of the Federated Logic Conferences (FLoC) 2018. There is still no decision regarding the Chair of the PC, but the Conference Chair will be Paula Severi.

The 21 workshop organisers were responsible for a programme with a total of 99 talks, including 20 invited talks by:

- Marc Bezem (CL&C);
- Michael Batanin, Joachim Kock and Pawel Sobocinski (HDRA);
- Martin Escardo and Floris Van Doorn (HoTT-UF);
- Ashish Tiwari, Brigitte Pientka and Mauricio Ayala-Rincón (IFIP WG 1.6);
- Kazushige Terui and Michele Pagani (ITRS);
- Dale Miller and Daniyar Shamkanov (Linearity);
- Joachim Breitner (LFMTP);
- Gilles Barthe, Kaustuv Chaudhuri and João Marques Silva (LSFA);
- Ralf Sasse and Wojciech Dzik (UNIF);
- Beniamino Accattoli (WPTE).

Putting it all together, the full programme comprised 135 talks, triggering active conversations among participants during sessions but also outside of them. The venue's building and its surrounding garden, provided appropriate spaces for participants to gather in discussions leading to a dynamic and collaborative environment.

FSCD 2016 intensive scientific programme was complemented by an equally vibrant social programme. This was a very special time of the year in Porto, during which the Festival of Saint John of Porto took place. The Porto Festival of Saint John is one of Europe's liveliest street festivals. The festival lasts for several days, with its peak at



Fig. 2. The night of Saint John

the night of 23rd to 24th of June, the so called *night of Saint John*. The social agenda for FSCD 2016 was organised taking into account the festivities around the city.

On the evening of the 22nd of June, the participants were invited to a reception taking place at the University Rectory building, in the historic center of the city. The reception was accompanied by a music performance from Porto's distinguished harpist, the talented Eleonor Picas. The next evening was the night of Saint John, with popular dancing parties from Ribeira to Foz all night long. Grilled sardines, barbecues, bonfires, potted basil plants (*"manjericos"*) and the sky covered by incandescent sky lanterns (*"balões de S. João"*) launched from every corner, made this a truly unique experience for the participants. At 10:30 pm, participants of FSCD 2016 gathered in front of the University Rectory building to launch a huge *"balão de S. João"*, in celebration of the new conference. Afterwards, participants went into the historic city center to immerse themselves into the festivities and look for a place to enjoy the magnificent display of fireworks that took place at midnight near the Douro river.

On the afternoon of the 24th of June, the participants were taken across the Douro river to visit the lovely riverside of Gaia, where most of the Port wine cellars are located. It is from the riverside of Gaia that the most beautiful sights of Porto can be enjoyed. As part of the Saint John festivities, the participants were able to enjoy one of Porto's most iconic events: the *Saint John Rabelo Boat Regatta*. Rabelo boats representing several Port Wine Houses raced upriver, with their unfurled sails displaying their house. The regatta was followed by a guided visit to one of the biggest Port wine cellars (Taylor's), ending at the Barão Fladgate restaurant where aperitifs and drinks were served prior to the conference banquet. The view of Porto from the terrace of Taylor's restaurant is magnificent, namely the Ribeira landscape and D. Luís bridge. The dinner featured a performance by a jazz band, composed of musicians who are also research members from the University of Porto. The banquet was also the occasion to present the certificates and prizes to the authors of awarded best papers.

All things considered, the consensus was that FSCD 2016 was a resounding success and an excellent start to the new conference, that one hopes will serve the scientific community for many years to come.



Fig. 3. Excursion and banquet