TC1 "Foundations of Computer Science" Activity Report

Luís Soares Barbosa, TC1 chair

1   Introduction

Established as Special Group (SG14) in 1989 and approved as a Technical Committee in 1996, TC1 aims at supporting the development of Theoretical Computer Science as a fundamental science, and its engineering, as well as the design of bridges with other sciences and their applications.

This anual activity report, covering essentially the period from 1 July 2020 – 30 June 2021, will be presented to the IFIP General Assembly, to take place virtually from 21 to 22 September, 2021.

2   Organisation of TC1 and Membership

Similarly to what happened in the previous reporting period, TC1 dynamics was essentially restricted to administrative duties, due, to a large extent, to the effects of Covid-19 and its consequences in academic life worldwide. Nevertheless all TC1 Working Groups were quite active as reported below.

A Business Meeting took place virtually in October 2020. A main discussion topic was the role of TC1 as the IFIP "branch" on foundations of Computer Science. The Technical Committee discussed how to make this area more visible inside IFIP, and TC1 more effective, with increased relevance for the community and society at large. Unfortunately, the idea of organising a common event and summer school, which has been on the table since 2019, was postponed again due to the Covid-19 pandemic.

TC1 contributed with two chapters to the AICT 600 book, one of the IFIP Jubiliee Festschrif volumes recently published by Springer:

- *Hot Current Topics of Descriptional Complexity*, by Martin Kutrib, Nelma Moreira, Giovanni Pighizzini, and Rogério Reis (pages 3–28)

- *A Survey of Compositional Signal Flow Theory*, by Filippo Bonchi, Pawel Sobociński, and Fabio Zanasi (pages 29–56)

3   Working Group administration and dynamics

The scientific activity of TC1 takes places in its Working Groups. All of them have either their own flagship conferences and/or are deeply involved in the organisation of conferences with which they colocate their own workshops and business meetings.

Due to the ongoing Covid-19 pandemic, several Working Groups promoted their scientific events and business meetings in on-line or hybrid formats, and currently allow for virtual participation at their meetings.

The WG activity reports, collected in appendix to this document, and their web pages, give a good account of both their internal dynamics, and the scientific subjects that their communities are currently tackling.

The following changes in the WG coordination took place:

– *Georg Moser* stepped down as chair of WG 1.06, and was replaced by *Cynthia Kop*, from Radboud University Nijmegen, The Netherlands. *Carsten Fuhs*, Birkbeck, University of London, UK, was chosen as Vice-chair and Secretary to the Working Group.

– *Ilaria Castellani* stepped down as chair of WG 1.08, and was replaced by *Pedro R. D'Argenio*, Universidad Nacional de Córdoba and CONICET, Argentina. *Ana Sokolova*, University of Salzburg, Austria, became Secretary to the Working Group.

– *Jean-Christophe Filliâtre* stepped down as chair of WG 1.09 in 2020. *Jim Woodcock*, University of York, UK, is taking responsibility as WG Chair *ad interim*.

The list of Working Groups of TC1, with their chairs, vice-chairs and secretaries as of the date of writing, is thus established as follows.

WG		Chair	Secretary
1.02	Descriptional Complexity	Martin Kutrib Rogério Reis (Vice)	Andreas Malcher
1.03	Foundations of System Specification	Markus Roggenbach Lutz Schröder (Vice)	
1.05	Cellular Automata and Discrete Complex Systems	Pedro Balbi de Oliveira Nazim Fates (Vice)	Katsunobu Imai
1.06	Rewriting	Cynthia Kop Carsten Fuhs (vice)	Carsten Fuhs
1.07	Theoretical Foundations of Security Analysis and Design	Sebastian Mödersheim Véronique Cortier (Vice)	Luca Viganò
1.08	Concurrency Theory	Pedro R. D'Argenio	Ana Sokolova
1.09	Verified Software	Jim Woodcock	
1.10	String Algorithmics & Applications	Jan Holub	

The up-to-date member lists for each WG are available the corresponding web pages (accessible from the TC1 web page at `ifip-tc1.org`). IFIP web page: `www.ifip.org/bulletin/bulltcs/memtc01.htm` gives the member list for every Working Group as well.

Appendix A

Reports from TC1 Working Groups

WG 1.02 – Descriptional Complexity

Chair: Prof. Martin Kutrib, Universität Giessen, Germany

Vice-Chair: Prof. Rogério Reis, Universidade do Porto, Portugal

Secretary: Dr. Andreas Malcher, Universität Giessen, Germany

Home page: `www.informatik.uni-giessen.de/ifipwg1.2`

<div align="center">2020-21 Brief Activity Report</div>

Descriptional complexity has historically been a multidisciplinary area of study, with contributions from automata theory, computational complexity, cryptography, information theory, probability, statistics, pattern recognition, machine learning, computational learning theory, computer vision, neural networks, formal languages and other fields. The aims of the working group are therefore to promote research in all aspects of descriptional complexity through conferences, publications, and more informal means of scientific interaction such as electronic news groups. Since 2002 particular emphasis was and is being placed on the descriptional complexity of bio-inspired computing models and the relationship between descriptional complexity and software reliability.

The scope of the working group encompasses all aspects of descriptional complexity, both theory and application. These aspects include but are not limited to

– descriptional complexity of formal systems and structures,

– various measures of descriptional complexity of automata, grammars, languages and of related systems,

– trade-offs between descriptional complexity and mode of operation,

– circuit complexity of Boolean functions and related measures,

– succinctness of description of (finite) objects,

– descriptional complexity in resource bounded or structure bounded environments,

– structural complexity,

– descriptional complexity of formal systems for applications (for example, software reliability, software and hardware testing, modeling of natural languages),

– descriptional complexity aspects of nature motivated (bio-inspired) architectures and unconventional models of computing,

– algorithmic and other descriptional theories of randomness.

Furthermore, the WG tries to promote interaction and the exchange of information across traditional discipline boundaries and to provide a point of contact for all researchers in all disciplines interested in descriptional complexity and its applications.

Organisation of WG and Membership

Chairpersonship

No changes during this period.

New members

No changes during this period.

Scientific activities and meetings

Events organised by the Working Group

– The *22th International Conference on Descriptional Complexity of Formal Systems (DCFS 2020)* was expected to be jointly organized, under supervision of the DCFS steering committee, by Rudolf Freund (TU Wien) from August 24 to 26, 2020 in Vienna as PC co-chair with Galina Jirásková (Slovak Academy of Sciences) and Giovanni Pighizzini (University of Milano). Due to the development of the crisis caused by the Corona virus, the conference had to be canceled. In order to allow researchers in the area of descriptional complexity to still present their recent results in some form, the DCFS steering committee decided to prepare a volume of collected papers. The volume edited by Galina Jirásková and Giovanni Pighizzini has been published as volume 12442 of the Lecture Notes in Computer Science book series. It consists of 19 regular contributions which were selected by a committee after a standard review process. A special issue of Journal of Automata, Languages and Combinatorics devoted to extended versions of selected papers is in preparation.

– *23th International Conference on Descriptional Complexity of Formal Systems (DCFS 2021)* was expected to be jointly organized, under supervision of the DCFS steering committee, by Yo-Sub Han (Yonsei University) from June 21 to 24, 2021 in Seoul, South Korea, as PC co-chair with Sang-Ki Ko (Kangwon National University, South Korea). Due to the ongoing crisis caused by the Corona virus, the conference had to be canceled again. As for DCFS 2020 the DCFS steering committee decided to prepare a volume of collected papers in order to allow researchers in the area of descriptional complexity to still present their recent results. The volume is edited by Yo-Sub Han and Sang-Ki Ko and will be published as volume 13037 of the Lecture Notes in Computer Science book series. Together 16 regular contributions were selected by a committee after a standard review process. A special issue of International Journal of Foundations of Computer Science devoted to extended versions of selected papers is planned.

Formal meetings of the Working Group

– The next formal meeting of the working group is planned in 2022 on the occasion of DCFS 2022 in Debrecen, Hungary.

Forthcoming events

– *24th International Conference on Descriptional Complexity of Formal Systems (DCFS 2022).* The conference will be held in Debrecen, Hungary, and it will be organized by György Vaszil.

– *25th International Conference on Descriptional Complexity of Formal Systems (DCFS 2023).* The conference will be held in Potsdam, Germany, and it will be organized by Henning Bordihn.

Publications

– Galina Jirásková, Giovanni Pighizzini (eds.): Descriptional Complexity of Formal Systems – 22nd IFIP WG 1.02 International Conference, DCFS 2020, Proceedings. Lecture Notes in Computer Science 12442, Springer 2020.

– Information and Computation, special issue with selected and extended papers of the 21st International Conference on Descriptional Complexity of Formal Systems (DCFS 2019), guest editors: Michal Hospodár, Galina Jirásková, to appear.

– Journal of Automata, Languages and Combinatorics, special issue with selected and extended papers of the 22th International Conference on Descriptional Complexity of Formal Systems (DCFS 2020), guest editors: Galina Jirásková, Giovanni Pighizzini, in preparation.

– Yo-Sub Han, Sang-Ki Ko (eds.): Collected Papers dedicated to Descriptional Complexity of Formal Systems (DCFS 2021), Lecture Notes in Computer Science 13037, Springer 2021, to appear.

WG 1.03 — Foundations of System Specification

Chair: Prof. Markus Roggenbach, Swansea University, Wales, UK

Vice-Chair: Prof. Lutz Schröder, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

Home page: `ifipwg13.cs.ovgu.de`

<div align="center">2020-21 BRIEF ACTIVITY REPORT</div>

Organisation of WG and Membership

New members

Martin Leucker and Michele Loreti join the group as new members. The group is keeping a stable membership level of around 40 members (excluding emeritus members), and has considered seven observers in the current report period.

New organisation rules

Adapting to the ongoing Covid-19 pandemic, the group currently allows for virtual participation at its meetings.

Scientific activities and meetings

Meetings

The meeting planned for September 2020 was cancelled due to the ongoing Covid-19 pandemic. The working group has held

– a virtual meeting on 27 & 28 March 2021, colocated with ETAPS 2021.

The next meeting is planned for January 2021, to be held in Salzburg, Austria. There will be the possibility for virtual participation via video conferencing for those who are hindered to travel due to the ongoing Covid-19 pandemic.

Forthcoming events

– The *9th Conference on Algebra and Coalgebra in Computer Science, CALCO 2021* was held in August, 2021, in Salzburg, Austria, in colocation with the 37th Conference on Mathematical Foundations of Programming Semantics, MFPS XXXVII.

– The *16th International Workshop on Coalgebraic Methods in Computer Science (CMCS 2022)* is an official workshop of *European Joint Conferences on Theory and Practice of Software, ETAPS 2022*. CMCS 2022 will take place as a satellite event of ETAPS 2022.

– The *26th International Workshop on Algebraic Development Techniques, WADT 2022* will take place in Portugal as a stand alone workshop in June 2022.

WG 1.05 — Cellular Automata and Discrete Complex Systems

Chair: Prof. Pedro P.B. de Oliveira, Mackenzie Presbyterian University, São Paulo, Brazil

Vice-Chair: Dr. Nazim Fatès, INRIA Nancy, France

Secretary: Prof. Katsunobu Imai, Hiroshima University, Japan

Home page: http://www.iec.hiroshima-u.ac.jp/ifip15

2020-21 Brief Activity Report

The Working Group 1.5, on *Cellular Automata and Discrete Complex Systems*, reestablished in 2008, has the following attributions:

– To establish and maintain a permanent, international, multidisciplinary forum for the collaboration of researchers in the field of Cellular Automata (CA) and Discrete Complex Systems (DCS).

– To provide a platform for presenting and discussing new ideas and results.

– To support the development of theory and applications of CA and DCS (e.g. parallel computing, physics, biology, social sciences, and others) as long as fundamental aspects and their relations are concerned.

– To identify and study within an inter- and multidisciplinary context, the important fundamental aspects, concepts, notions and problems concerning CA and DCS.

The scope of the working group encompasses all fundamental aspects of cellular automata and discrete complex systems, including: Dynamics, Algebraic aspects, Complexity issues, Emergent properties, Formal language processing, Models of parallelism and distributed systems, Phenomenological descriptions, Scientific modelling and Practical applications.

Organisation of WG and Membership

Chairpersonship

The 2021 admin meeting of IFIP WG-1.5 was held remotely on July 12th, at 18:15 hours (CEST time zone), attended by 14 members of the group, namely: Anna Lawniczak, Dipanwita Roy Chowdhuri, Guillaume Theyssier, Georgios Sirakoulis, Ilkka Törmä, Jarkko Kari, Kévin Perrot, Luca Mariot, Martin Kutrib, Nazim Fatès (*Vice-Chair*), Pedro de Oliveira (*Chair*), Pierre Guillon, Siamak Taati and Thomas Worsch.

Because of the novelty in the publication scheme of the event, the meeting started with Kévin Perrot making a short report on the first experience of publishing the proceedings with OASIcs. As he reported, the whole process ran very smoothly and easy, with no mishaps whatsoever.

The next topic in the agenda was an updated presentation of the organisation of AUTOMATA 2022, by WG-1.5 member Dipanwita Roy Chowdhury.

Two proposals of new memberships to WG-1.5 were then made, led by Nazim Fatès and Pedro de Oliveira, with support from various members of the group.

Finally, we addressed the election process of the new Chair of WG-1.5, to take place later this year.

New members

Two indications of new members to WG-1.5 were announced and voted, both having been accepted. With the new additions, WG-1.5 now has 56 members, from 19 countries (details in http://www.iec.hiroshima-u.ac.jp/ifip15/members). The new members are:

– *Alonso Castillo-Ramirez*, from the Department of Mathematics of the Universidad de Guadalajara, Mexico; and

– *Barbara Wolnik*, from the Institute of Mathematics, Faculty of Mathematics, Physics and Informatics, University of Gda?sk, Poland.

It is worth mentioning that the voting of the new members was carried out in real time via the Mentimeter online system (https://www.mentimeter.com), which, although not being a true voting system in terms of security architecture, it is extremely useful for quickly and anonymously collecting real time manifestations about a subject. Furthermore, it is free and very easy to use. I would particularly recommend it for all future daily decisions we make during our admin meetings, in order to substitute the decisions by acclamation.

New organisation rules

Following the extensive discussions held during the last couple of years within our group, AUTOMATA 2021 became the first edition with an open access publication scheme, which we expect will be preserved in the future editions, in tune with the international trend in this direction. As previously agreed upon, the full papers were then published in OASIcs, the Open Access Series in Informatics (https://www.dagstuhl.de/en/publications/oasics, a service provided by the same institution that publishes LIPIcs, the Schloss Dagstuhl, in Germany). Coherently with the open publication of the full papers, the exploratory papers have also been published with open access, but in the HAL repository, in France.

Considering that the current Chair of WG-1.5 is finishing the second consecutive three-year term in 2021, the maximum according to IFIP's bylaws, there is the necessity of appointing a new Chair of WG-1.5 for the triennium starting in 2022. The accepted proposal is that the election will take place in November 2021, once again with the very safe and reliable Belenios online voting system (www.belenios.org). So far we have one confirmed indication for the post, but other potential candidates may still step forward or be indicated.

Scientific activities and meetings

Events organised by the Working Group

– AUTOMATA 2021 - *The 27th International Workshop on Cellular Automata and Discrete Complex Systems*, Marseille, France, during July 12-14, 2021.

AUTOMATA 2021 was successfully organised by our group members? Pierre Guillon, Guillaume Theyssier and Kévin Perrot (among others), all associated with Aix-Marseille Université, in Marseille, France, and held in hybrid mode in July 12-14, 2021. The event had been planned as usual, but the pandemic enforced it to happen in hybrid fashion, with remote participants from various parts of the world and others in person at CIRM – Centre International de Rencontres Mathématiques, on the Luminy campus of Aix-Marseille Université.

In spite of the hybrid mode, the event was very successful and everything flowed very well, with negligible technological mishaps along the way. The event was totally free, sufficing for interested participants to register.

There were 99 registered participants, 51 attending remotely and 48 on site, from 18 countries, as follows: France: 45; Chile: 16; USA: 6; Brazil: 5; Germany: 5; Finland: 4; Poland: 4; Mexico: 3;

Netherlands: 2; Tunisia: 2; Algeria: 1; Belgium: 1; Canada: 1; England: 1; Italy: 1; Ivory Coast: 1; Lebanon: 1; Turkey: 1.

The event ran for two and a half days. Out of 23 submissions, the technical programme had 8 full papers and 10 exploratory papers, in addition to 4 invited talks. The last day of AUTOMATA 2021 was shared with WAN 2021 - Workshop on Automata Networks, and included a very nice Festschrift type celebration to our group member Eric Goles, due to his 70th birthday. Further details about the joint AUTOMATA-WAN event are available in https://automata-wan-2021.lis-lab.fr/#automata2021-link.

Forthcoming events

– AUTOMATA 2022 - *The 28th International Workshop on Cellular Automata and Discrete Complex Systems*, to be held at the Indian Institute of Technology Kharagpur, in Kharagpur, India, in September or October 2022.

– There is already a bid for hosting AUTOMATA 2023, but yet to be fully confirmed.

Publications

– Alonso Castillo-Ramirez, Pierre Guillon and Kévin Perrot (Eds.). *27th IFIP WG 1.5 International Workshop on Cellular Automata and Discrete Complex Systems (AUTOMATA 2021)*, OASICS Vol. 90, 2021.

– Alonso Castillo-Ramirez, Pierre Guillon and Kévin Perrot (Eds.). *27th IFIP WG 1.5 International Workshop on Cellular Automata and Discrete Complex Systems (AUTOMATA 2021): Exploratory Papers collection*, HAL Archives Ouvertes, 2021.

WG 1.06 — Rewriting

Chair: Dr. Cynthia Kop, Radboud University Nijmegen, The Netherlands

Vice-chair and Secretary: Dr. Carsten Fuhs, Birkbeck, University of London, United Kingdom

Home page: `https://ifip-wg-rewriting.cs.ru.nl/`

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2020-21 BRIEF ACTIVITY REPORT

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The Working Group aims to promote research efforts in rewriting and its applications. To do this, it aims to establish a close cooperation between existing groups and to facilitate the emergence of new ones. It wants to increase awareness of rewriting techniques in the computer science community at large and foster development of applications of theoretical advances.

Organisation of WG and Membership

The annual meeting of the IFIP WG 1.6 in 2021 was co-located with FSCD 2021 in Buenos Aires and was held *virtually* on 24 July. Like 2020, the hosting conferences decided on a fully virtual format, and the Working Group followed suit. The online format was not problematic.

The Working Group currently comprises 13 honorary members and 42 active members. At the annual meeting we have welcomed Mauricio Ayala-Rincón, Jörg Endrullis and Sarah Winkler as new members.

Chairpersonship and Secretary

Cynthia Kop is the current Chair of the Working Group. Her term will end in 2024. Carsten Fuhs is the current Co-chair and Secretary of the Working Group. Like the Chair's term, his term will end in 2024.

International Summer School on Rewriting

The 12th *International Summer School on Rewriting* (*ISR* for short) was held as a fully virtual event. The school took place from 5 July to 16 July 2021. The school was organised by Narciso Martí Oliet and had over 180 registered participants, indicating the high interest in rewriting in the community. See the School's website for further information on the organisation and success of the school: `https://dalila.sip.ucm.es/isr2021/`.

The 12th ISR was originally planned for Madrid, Spain, in 2020, but was postponed due to COVID-19 pandemic. Its format was substantially changed to support the online nature.

The 13th ISR will be organised by Besik Dundua and Temur Kutsia in the week of 19–26 September 2022, within the Computational Logic Autumn Summit in Tbilisi, Georgia.

Events organised by the Working Group

- The annual meeting of the WG in 2021 took place on 24 July 2021.

- The 12th ISR was organised virtually in Madrid in July 2021.

- The 13th ISR will be held in Tbilisi in September 2022.

Forthcoming events

The next meeting of the working group is planned for July or August 2022, as part of the Federated Logic Conferences (FLoC) 2022:
`https://floc2022.org/`

WG 1.07 — Theoretical Foundations of Security Analysis and Design

Chair: Prof. Sebastian Mödersheim, Technical University of Denmark

Vice-Chair: Prof. Véronique Cortier, University of Nancy, France

Secretary: Prof. Luca Viganò, King's College London, UK

Home page: `http://ifipwg1-7.compute.dtu.dk`

2020-21 BRIEF ACTIVITY REPORT

The WG 1.7 promotes activities in the area of theoretical foundations of security analysis and design, and has been established in 1999. It mainly aims at investigating the theory of security, as well as of privacy and trust, at discovering and promoting new areas of application of theoretical techniques in computer security and at supporting the systematic use of formal techniques in the development of security related applications.

Organisation of WG and Membership

Currently the WG has 32 members, from 14 countries and 4 continents:

- Europe: 23 (France: 6, UK: 3, Germany: 5, Italy: 2, Belgium, Denmark, Ireland, Luxemburg, Netherlands, Spain, Switzerland: 1)

- America: 6 (USA)

- Asia: 1 (China)

- Australia: 2

Chairpersonship

Assoc. Prof. Sebastian Mödersheim, Technical University of Denmark (DTU), elected on 27 June 2019.

New and old members

It is with much sadness that Geoffrey Smith passed away.

Scientific activities and meetings

Remarkable results in the field of the WG

We had in 2020 re-established the IFIP WG 1.7 workshop HotSpot at the European Symposium on Security and Privacy (Euro S&P) in 2020. (It had been associated with ETAPS before but failed to attract enough submissions and had been dormant for a few years.) The 2020 edition of HotSpot, chaired by Joshua Guttman and Sebastian Mödersheim, as one of the most visited workshops.

We have therefore in our 2021 meeting decided to continue HotSpot at Euro S&P, this time with Toby Murray as chair and Sebastian Mödersheim as co-chair. Unfortunately this year the workshop (like most others at Euro S&P) received only few submissions. It was anyway possible to establish an exciting program with the help of six invited talks. The focus this year was on mechanized security proofs, which seems to gain more traction especially in the field of software security.

The 20th FOSAD summer school, originally scheduled in summer 2020, had been postponed due Covid-19 and now took place August 30 to September 3, 2021.

Events organised by the Working Group

Since September 2020, the WG members have organized the following events:

– ESORICS 2020: 25th European Symposium on Research in Computer Security (Program co-chair: Steve Schneider).

– STAST 2021: 11th International Workshop on Socio-Technical Aspects in Security. Affiliated with ESORICS 2020. (Program co-chair: Luca Viganò).

– and as already mentioned, HotSpot 2021: 7th Workshop on Hot Issues in Security Principles and Trust. (Program co-chairs: Toby Murray and Sebastian Mödersheim).

Forthcoming events

– Hot Issues in Security Principles and Trust (HotSpot). We plan to re-apply for a workshop at the next Euro-S& P.

WG 1.08 — Concurrency Theory

Chair: Prof. Pedro R. D'Argenio, Universidad Nacional de Córdoba & CONICET, Argentina

Secretary: Dr. Ana Sokolova University of Salzburg, Austria

Home page: `www.concurrency-theory.org/organizations/ifip`

<div align="center">2020-21 Brief Activity Report</div>

The aim of this working group is to develop the theoretical foundations of concurrency, exploring the frontiers of existing theoretical models such as labelled transition systems, process calculi, Event Structures and Petri Nets, and various forms of enriched automata, so as to obtain a deeper understanding of concurrent systems and push forward the associated verification techniques.

Organisation of the WG and Membership

Currently, the WG has 52 members (10 women, 42 men). Since the WG creation in 2005, there has been a turnover of -13, + 13. We have been constantly trying to improve the gender balance within the WG, both when recruiting new members and when choosing invited speakers and sending personal invitations for the events organised by the WG.

The last recruitment campaign was held in 2016, resulting in the recruitment of 10 new members (6 men and 4 women). In the las WG 1.8 meeting there was an agreement to organise a new round of recruitments.

Chairpersonship

Prof. Pedro R. D'Argenio (UNC & CONICET, Argentina) and Dr. Ana Sokolova (University of Salzburg, Austria) started coordinating the WG 1.8 in January 2021 respectively as chairperson and secretary of the WG. A round of elections was held by the TC chair in December 2020, which led to their election.

Events organised by the WG

1) TRENDS (New Trends in Concurrency Theory)

Since 2012, the WG organises an annual event called TRENDS, in affiliation with the conference CONCUR (the main conference in the field). TRENDS was originally a half-day workshop, consisting of invited talks only. Since 2016, it was turned into a full-day workshop, with both invited talks and a number of "highlight talks" given by WG members or other participants. The aim of TRENDS is to stir discussion on recent trends and open problems in Concurrency Theory. It is informal, without proceedings. Since last edition in 2020, due to the sanitary crisis, the workshop is held online only with invited speakers and for half a day.

TRENDS 2021 was held online on August 28, 2021 (`https://concurrency-theory.org/events/trends/2021/`). As usual, it was co-located with CONCUR 2021 within the umbrella event QONFEST 2020 (`https://qonfest2021.lacl.fr/`). This edition was registered within IFIP 60th jubilee and the programme consisted of the following 3 invited talks:

- Christel Baier, Technische Universitt Dresden, DE. *From verification to causality-based explications.*

- Alexey Gotsman, IMDEA Software Institute, SP. *Rigorous Design of Atomic Transaction Commit Protocols.*

– Ilaria Castellani, INRIA Sophia Antipolis, FR. *Event structure semantics for asynchronous multi-party sessions.*

The workshop was followed by the WG business meeting.

2) OPCT (Open Problems in Concurrency Theory)

Another event that is regularly organised by the WG 1.8 is the workshop OPCT (Open Problems in Concurrency Theory), which aims at identifying the most important open problems in Concurrency Theory. This is a research seminar without proceedings, where participation is on invitation only. Its average duration is of three days, and its frequency is of one edition every 2-3 years. The three editions of OPCT took place respectively in 2014 in Bertinoro, in 2017 in Vienna, and in 2019 in Lisbon, and they were always very successful, gathering each time an attendance of 50-60 people. See the following links:

OPCT 2014: `http://www.sti.uniurb.it/events/opct2014/`

OPCT 2017: `http://opct2017.famaf.unc.edu.ar/Home.html`

OPCT 2019: `https://popl19.sigplan.org/track/opct-2019-papers`

While OPCT is usually organised as a stand-alone event, its 2019 edition was held in affiliation with the POPL conference: `https://popl19.sigplan.org/`

Though a new edition was expected for 2021 or 2022, in our last business meeting at TRENDS, there was an agreement to postpone it to 2023 with the original stand-alone format of the 2014 and 2017 editions.

3) TTCS (Topics in Theoretical Computer Science)

A further event that is sponsored by the WG 1.8 is the international conference on Topics in Theoretical Computer Science (TTCS), whose first two editions were held at the School of Computer Science, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran, respectively in 2015 and 2017, while the third one in 2020 was held online. See the following links:

TTCS 2015: `http://cs.ipm.ac.ir/ttcs/2015/`

TTCS 2017: `http://cs.ipm.ac.ir/ttcs/2017/`

TTCS 2020: `http://cs.ipm.ac.ir/ttcs/2020/`

It is our intention to keep the agreement.

Publications

In the past, four special issues of the Journal of Logical and Algebraic Methods in Programming (JLAMP) have been organised: two of them as an outcome of OPCT 2014 and 2017, and the other two as an outcome of TRENDS 2014, 2015, and 2016:

OPCT 2014: `https://doi.org/10.1016/j.jlamp.2015.10.002`

OPCT 2017: `https://www.sciencedirect.com/science/journal/23522208/vsi/100VL3RV0MN`

TRENDS 2014-2015: `https://doi.org/10.1016/j.jlamp.2017.01.002`

TRENDS 2015-2016: `https://doi.org/10.1016/j.jlamp.2019.07.001`

Contribution for creating the CONCUR Test-of-Time award

Our WG contributed to the creation of a Test-of-Time award for the papers published in the CONCUR conferences. The first edition took place during CONCUR 2020 and papers for the periods 1990-1993 and 1992-1995 were awarded.

The second edition took place during CONCUR 2021 and papers for the periods 1994-1997 and 1996-1999 were awarded. The Jury of the Award for this last edition was chaired by Rob van Glabbeek, and composed by Luca de Alfaro, Nathalie Bertrand, Catuscia Palamidessi, and Nobuko Yoshida. Three of them are members of the WG. It is worth mentioning that tree the four awarded papers were co-authored by WG members.

1st CONCUR ToT award: `https://concur2020.forsyte.at/test-of-time.html`

2nd CONCUR ToT award: `https://qonfest2021.lacl.fr/test-of-time.php`

WG 1.09/2.15 — Verified Software

Chair: Dr. Jean-Christophe Filliâtre, CNRS, Orsay, France

Vice-Chair: Prof. Jim Woodcock University of York, UK

Secretary: Dr. Natarajan Shankar, SRI International, US

Home page: `https://www.lri.fr/~filliatr/1.9/`

<div align="center">2020-21 BRIEF ACTIVITY REPORT</div>

The aims of 1.9/2.15 are to contribute to a comprehensive theory of programming that covers the features needed to build practical and reliable programs; to contribute to a coherent toolset that automates the theory and scales up to the analysis of industrial-strength software; and to collect realistic, verified programs as part of the Verified Software Initiative (VSI) Repository.

Since the creation of the group in 2011, we had twelve meetings. These meetings are sometimes co-located with conferences of our domain (e.g. CAV, POPL) to limit travels, though this is not a rule.

We invite different observers to attend our meetings each time, and we collectively decide to elect some of them as new members whenever they participated actively and constructively to our meetings.

Our meetings encourage talks on work in progress and leave much room to discussion. Each talk is typically given one hour.

We also run the VSTTE conference and the Verified Software Competition (vscomp `http://vscomp.org/`, not to be confused with the VerifyThis competition, another competition of our domain).

Organisation of WG and Membership

Chairpersonship

We plan to find a new chair, and Jim Woodcock is taking responsibility in the interim.

New members

No changes in the members during the period, but we plan to draw fresh members to the group.

The current number of members of the group is 21 (+ 3 emeriti).

New organisation rules

No changes in the organisation rules during the period.

Scientific activities and meetings

Events organised by the Working Group

We had no meeting in the period (July 2020 – July 2021), due do the COVID-19 situation.

Forthcoming events

We plan to have an in-person meeting at every FMCAD, at least, and virtual meetings in the meantime.

WG 1.10 – String Algorithmics & Applications

Chair: Prof. Jan Holub, Czech Technical University in Prague, Prague, Czech Republic

Home page: http://www.stringology.org/ifip/

The WG 1.10 aims to promote research in String Algorithmics (combinatorics on words, string algorithms) and applications. It proposes a unique forum for the best available research that will provide sustained inspiration within the stringological community for still better research. We intend to take advantage of the applied nature of a very theoretical topic to encourage both theory and practice in the group. At both ends our main concern is to promote relevant research of the very highest quality.

The scope the group is paradoxically both well-focussed and broad: well-focussed because the underlying combinatorial object is text, a simple word, a piece of string; broad because of the numerous applications (combinatorics on words, finite automata), but also algorithms on strings, and so the application areas for those algorithms, of which a partial list follows:

- computational biology (including system biology, biology/PPI networks),

- text compression,

- natural language processing,

- information retrieval, both on and off the Internet (including search engines, massive indexing applications),

- data mining,

- pattern recognition,

- software engineering,

- cryptology,

- computational geometry,

- computational musicology.

Organisation of WG and Membership

Chairpersonship

Jan Holub is a chair of WG since 2019 when the WG was re-established.

New members

No changes in the members during the period.

New organisation rules

No changes in the organisation rules during the period.

Events organised by the Working Group

– 24th Prague Stringology Conference (PSC 2020). Prague, Czech Republic, August 31–September 2, 2020,

– 27th International Symposium on String Processing and Information Retrieval (SPIRE 2020). Orlando, USA, October 13-15, 2020,

– 32nd Annual Symposium on Combinatorial Pattern Matching (CPM 2021). WrocÇaw, Poland, July 5-Äì7, 2021.

Forthcoming events

– 25th Prague Stringology Conference (PSC 2021). Prague, Czech Republic, August 30–31, 2021,

– 28th International Symposium on String Processing and Information Retrieval (SPIRE 2021). Lille, France, October 4–6, 2021,

– 33rd Annual Symposium on Combinatorial Pattern Matching (CPM 2022). Prague, Czech Republic.