Summary of the 2019 International Conference on Software and System Processes (ICSSP 2019)

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ABSTRACT

The 2019 International Conference on Software and System Processes (ICSSP 2019) was held in conjunction with the 41st International Conference on Software Engineering (ICSE 2019) in Montreal, Canada, May 25-26, 2019. ICSSP is a leading international forum for research on software and systems processes–the 2019 conference extended a sequence of predecessor conferences and workshops stretching back more than a decade. Although ICSSP has often been associated with ICSE and "in cooperation" with ACM, 2019 was the first year that ICSSP was operated under a full co-located event agreement with ICSE and was fully sponsored by ACM and IEEE. ICSSP 2019 was organized, as usual, by the International Software and Systems Process Association.

The theme of ICSSP 2019 was "Hybrid and Evolving Processes for Software and Systems." To address this topic, ICSSP 2019 brought together researchers and practitioners representing 16 countries. The technical program consisted of 21 papers presented in sessions on Agile Processes, Hybrid Processes and Teams, Incremental Development, and other topics. The conference included a keynote presentation by Philippe Kruchten on "The End of Agile as We Know It." The conference also saw the introduction of its first-ever Doctoral Track, intended to give in-progress graduate students an early welcome into the ICSSP community.

Categories and Subject Descriptors

D.2.9 [**Management**]; K.6.1 [**Project and People Management**]; K.6.3 [**Software management**]; K.1 [**The Computer Industry**]

General Terms

Management, Measurement, Documentation, Economics, Human Factors, Standardization

Keywords

Software development, systems development, development process, agile methods, hybrid methods, process evolution, process customization, process modeling, process mining, process metrics, process analysis

1. INTRODUCTION

The ICSSP conference series is dedicated to presenting the latest research on engineering aspects of the development, deployment, evolution, and maintenance of complex software and systems. The series aims to bring together leading academic and industrial workers from around the world, including researchers, practitioners, and students. It provides a forum to address problems, solutions, challenges, and opportunities arising in evolving technical, social, and business environments. Process is the fundamental thread that ties these diverse and dynamic concerens together.

ICSSP 2019 was the ninth conference under that name and extended a longer sequence of successful predecessor events, including the Software Process Workshops (SPW), the Software Process Modeling and Simulation Workshops (ProSim), and the International Conferences on Software Process (ICSP). The ICSSP series is organized by the International Software and Systems Process Association (ISSPA), which constitutes the ICSSP Steering Committee. Although ICSSP has often been associated with ICSE and "in cooperation" with the ACM (the Association for Computing Machinery), 2019 was the first year that ICSSP was operated under a full co-located event agreement with ICSE and was fully sponsored by ACM and IEEE (the Institute of Electrical and Electronics Engineers).

The theme of ICSSP 2019 was "Hybrid and Evolving Processes for Software and Systems." This was motivated by the observation that software engineering continuously reinvents the way software and software intensive systems are built. As companies are moving towards new technologies and tools, agile principles, and continuous integration and delivery, they find opportunity, flexibility, and strength in evolving toward hybrid processes, which are neither purely traditional nor text-book agile. For ICSSP 2019 we asked: What will the next generation of process paradigms look like? How will they emerge from current paradigms? How will the concerns of business and system stakeholders drive and reflect the development and evolution of processes in coming years? And what can our experience of change teach us?

2. ORGANIZATION

The Organizing Committee for ICSSP 2019 consisted of Stanley Sutton (independent researcher, NY, USA), General Chair; Regina Hebig (Chalmers/University of Gothenburg, Sweden) and Ove Armbrust (Intel Corporation, Portland, OR, USA), Program Committee Chairs; Paul Clarke (Dublin City University and LERO, Ireland), Doctoral Track Chair; Ayśe Tosun (Istanbul Technical University, Turkey), Publicity Chair; and Davide Fucci (University of Hamburg, Germany), Social Media Chair.

The Program Committee had 49 members from 19 countries. The inaugural Doctoral Track had a committee of 20 members from 12 countries. These committees are listed in Tables 1 and 2.

Table 1: ICSSP 2019 Main Program Committee.

Paula Berman	Andrea Marrella
Andrea Burattin	Juergen Muench
Danilo Caivano	Joyce Nakatumba
Josep Carmona	Maleknaz Nayebi
Bernard Coulette	Kenneth Nidiffer
Maya Daneva	Rory O'Connor
Claudio Di Ciccio	Leon Osterweil
Chiara Di Francescomarino	Rafael Prikladnicki
Michael Felderer	Mushtaq Raza
Davide Fucci	Daniel Rodriguez
Luciano García-Bañuelos	Stefan Sauer
Christiane Gresse von Wangenheim	Walt Scacchi
Regina Hebig	Tijs Slaats
Jens Heidrich	Stanley Sutton
Graham Hellestrand	Binish Tanveer
Dan Houston	Paolo Tell
Liguo Huang	Ayśe Tosun
Hajimu Iida	Qing Wang
Amin Jalali	Hironori Washizaki
Jacky Keung	Dietmar Winkler
Jil Klünder	Krzysztof Wnuk
Supannika Koolmanojwong	Rebekka Wohlrab
Marco Kuhrmann	Murat Yilmaz
Chuanyi Li	Jason Zhang
Stephen MacDonell	

Table 2: ICSSP 2019 Doctoral Program Committee.

Ove Armbrust	Antoni Lluís Mesquida Calafat
Paul Clarke	Juergen Muench
Christiane Gresse von Wangenheim	Mirna Ariadna Muñoz Mata
Regina Hebig	So Norimatsu
Jens Heidrich	Rory O'Connor
Dan Houston	Vincent Ribaud
Marco Kuhrmann	Mercedes Ruiz Carreira
Claude Laporte	Stanley Sutton
Silvana Mac Mahon	Paolo Tell
Antonia Mas	Murat Yilmaz

3. SUBMISSIONS AND ACCEPTANCES

ICSSP 2019 solicited full papers (10 pages), short papers (5 pages), and posters for the main track. The kinds of papers solicited included full research reports and concise statements of research results; in-depth experience reports and short statement of problems in practice; and work-in-progress and conceptual and position papers. The conference also solicited short papers (4 pages) on student research in-progress for the Doctoral Track.

For the main track we received submissions of 34 full papers, 16 short papers, and one poster. Of these, 44 were reviewed, with each paper receiving at least three reviews, four receiving four reviews, and one receiving five. For the Doctoral track we received three submissions, each of which received four reviews. For the main track we accepted 14 full papers and five short papers, for an acceptance rate of 37%. For the Doctoral Track we accepted two of the three submissions.

The submissions to the main track included 185 authors from 27 countries, while the accepted papers included 60 authors from 18 countries. The submissions to the Doctoral Track came from three authors from three different countries. (See Figure 1.)

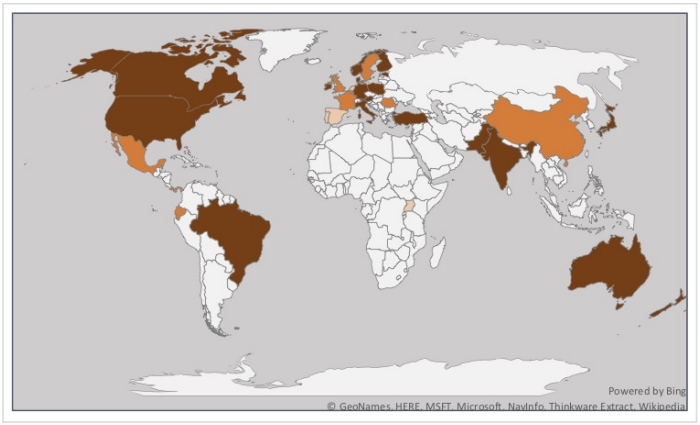

Figure 1: Countries from which papers were submitted (intermediate shading) and accepted (darkest shading) to ICSSP 2019. Additional countries represented on the Program Committee are also shown (lightest shading).

4. PROGRAM SUMMARY

The program of ICSSP 2019 comprised eight sessions, including one for the Doctoral Track, one for a keynote address, and six for technical presentations.

The Doctoral Track was a new event for ICSSP. Its introduction was driven by a keen appreciation of the importance of Doctoral studies and the many benefits that expert community-led constructive feedback can deliver in terms of enhancing Doctoral work. Toward this end, the Doctoral Track session was placed at the beginning of the schedule and the students presented their work to the whole conference as an integral part of the program. The invited students included Ritu Kapur, Indian Institute of Technology Ropar (Rupnagar, Punjab, India) who presented her paper "Towards a Knowledge Warehouse and Expert System for the Automation of SDLC Tasks" [8], and Md. Rejaul Karim, Nara Institute of Science and Technology (NAIST, Kansai Science City, Japan), who presented his paper "Key Features Recommendation to Improve Bug Reporting" [18].

The keynote address was a presentation by Philippe Kruchten on "The Death of Agile as We Know It" [12]. Philippe Kruchten is professor of software engineering at the University of British Columbia, in Vancouver, Canada, as well as principal at Kruchten Engineering Services Ltd. He joined academia in 2004 after a 30+ year career in industry, where he worked mostly in large software-intensive systems design, in the domains of telecommunication, defense, aerospace and transportation. In his talk he described the shifts in technology, such as the cloud and the emergence of software ecosystems, that are creating new needs in terms of process and project management. These can exploit the fundamental principles of agile, beyond the dogma of any particular method or practice. He argued that agile has been very valuable but, once its lessons are fully integrated in the way we work, we have to look beyond and stop repeating it like a mantra. In his words, "Agile is dead. Long live agility."

The main part of the ICSSP 2019 program consisted of six sessions with technical presentations. We give a telling quote from each of the papers presented:

- **Agile Processes**

  "Our findings indicate that, even in regulated industry sectors, companies increasingly adopt in–project SPI activities, primarily with the goal to continuously optimize specific processes." [13].

  "This independent development of a Scrumban-like process suggests that additional investigation of agile/open-source interactions would be fruitful." [19].

  "... groups with access to the additionally provided ProDynamics feedback showed a definite increase in the development performance throughout all sprints, while the teams without feedback access tend to have more problems in estimating sprint workloads and keeping up fulfilling the targeted goals." [9].

  "... we conclude that success factors concerning data availability, development process, and metrics trustworthiness warrant greater attention, especially to maximize the chances of long-term use of process metrics." [17].

- **Models, Ontologies, and Architecture**

  "Our experiment provides evidences that reviewing a generated review model instead of the original model-based specification of the functional design increases the quality of the reviews." [3].

  "We propose an ontology-driven approach to automating the process of integrating different security systems in a security orchestration platform." [7].

  "... we present a novel architecture recovery method which employs text classification to recover a concern- oriented view of a system." [14].

- **Mining and Comparisons**

  "The mined constraints describe the boundaries of the actual processes and thus help to understand process behavior." [11].

  "... process mining techniques are useful in understanding if the developers? behavior during the development sessions is compliant with a reference model and have the potential to give feedback useful to improve the coding process." [2].

  "We found that startups include various engineering and business competence, but do not cover all of what is needed. This leads to extra dependencies when producing MVPs." [5].

- **Hybrid Processes and Teams**

  "... using different frameworks, methods and practices in combination as hybrid methods is the norm across companies of all sizes and industry sectors." [20].

  "... it is possible to provide a unified view of projects independent from variations in methods and tools used in these projects." [21].

  "... a functional organisational model in a software development environment is generally a harmful construct and counter–productive to several important objectives being sought." [6].

- **Review Papers**

  "Various research approaches provide insights in the applied [Product Owner] role in industry—yet, a conclusive bigger picture of the studies and reports on this issue is missing." [22].

  "Quality realization happens through software processes and patterns, and it is necessary to evolve quality models and software process architectures that correlate quality definitions and quality realization mechanisms." [15].

  "The review found great variability of study findings, particularly concerning the impacts of agile and hybrid development practices on software productivity" [4].

- **Incremental Development**

  "... results show their improvements in out-of-sample estimation accuracy, provide a perspective about how estimation accuracy evolves throughout a software process, and set the practical criteria to decide the investment in analysis and design activities for the return in estimation accuracy." [16].

  "Agile CDD is a reuse-focused development process in which an application is built incrementally by repeatedly reusing other existing concerns." [1].

  "Introduced Continuous Integration and Continous Delivery model in validation of modern, complex embedded systems provides quick feedback information about new regressions and overall product quality." [10].

Note that there is a significant continuity of session themes from ICSSP 2018, which had sessions such as Agile and Hybrid Development, Continuous Development, and Learning from Process Data. Thus many of these topics have held persistent interest for the ICSSP community.

5. DISTINCTIONS

We were pleased to award a SIGSOFT Distinguished Paper Award to the paper "What are Hybrid Development Methods Made Of? An Evidence-based Characterization" by Paolo Tell, Jil Klünder, Steffen Küpper, David Raffo, Stephen MacDonell, Jürgen Münch, Dietmar Pfahl, Oliver Linssen, and Marco Kuhrmann [20]. Based on a large-scale online survey among practitioners that provided 1,467 data points, the authors found that a majority of project teams and companies use customized processes that combine different development methods but that only eight methods and few practices build the core of modern software development.

Additionally, we invited five author teams of the best submitted full papers to submit an extended version of their papers to a special issue of the *Journal of Software: Evolution and Process*[1], which is planned to appear early in 2020.

6. FUTURE

Plans call for ICSSP 2020 to be co-located with the 42nd ICSE in Seoul, South Korea. This will once again afford the ICSSP community the opportunity to interact with other ICSE co-located events. We look forward to another inspiring ICSSP program under the leadership of LiGuo Huang and David Raffo as General Chairs, and Paul Clarke and Eray Tüzün as Program Chairs.

7. ACKNOWLEDGMENTS

We owe thanks to our organizer, the International Software and Systems Process Association, and to our sponsors: ACM and ACM SIGSOFT[2], IEEE Computer Society and IEEE TCSE[3]. We are grateful to the support provided by the ICSE 2019 Organizing

[1] `https://onlinelibrary.wiley.com/journal/20477481`
[2] `https://www.acm.org`, `http://www.sigsoft.org/`
[3] `https://www.computer.org`, `http://www.cs-tcse.org`

Committee and the ICSE staff. We thank the Fraunhofer IESE[4] for their support of and assistance with the ICSSP Conferences web site[5]. Finally, we thank all of the many people who participated in the conference in some way, including the the 11 members of the ICSSP Steering Committee, the 185 authors of submitted papers, the 59 members of the combined program committees (who provided 154 reviews), and the 37 registered attendees.

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