



41st International Conference on Software Engineering

The Next 50 Years for Software Engineering










Program

May 25–31, 2019 | Montréal, QC, Canada

2019.icse-conferences.org

Week Overview

Co-located Events, Workshops and Mentoring Events				Main Conference		
Sat May 25	Sun May 26	Mon May 27	Tue May 28	Wed May 29	Thu May 30	Fri May 31
ICGSE			Doctoral Symposium	Keynote: Paul Clements	Keynote: Margaret-Anne Storey	Keynote: Joelle Pineau
ICPC						
ICSSP			New Faculty Symposium	Technical	Technical	Technical
MOBILESoft				SEIP	SEIP	SEIP
SEAMS		FormaliseSE	Student Mentoring Workshop	Demos	Demos	Demos
MSR		NIER		NIER	NIER	
OSS		Journal First		Journal First	Journal First	
TechDebt		BotSE		SEET	SEET	SEET
MiSE		CESSER-IP				
MET	AST	DeepTest		SEIS	SEIS	SEIS
CHASE		GI			Student Research Competition	
ECASE		IWoR				
EMIP		RAISE	Measuring Value in Software Delivery	AIOps	Developing Games that Capture and Engage Users	
GE		RET				
RCoSE/DDrEE		SE4Science	SRC Posters	Posters	Live Demos	
RoSE		SEiA				
SBST		SEmotion	R for SE Research	Presentation 101		
SEH		SEsCPS		Awards		Closing
SERP4IoT		SESoS/WDES	ACM/IEEE Town Hall	Banquet		
SST		SoHeal	Reception			
WETSEB		Kubernetes	<div>Badges</div> <div>Artifacts Evaluation:     </div> <div>Paper Award: </div> <div>Industry Program: </div>			
		Scale-Out Data Science				
		TensorFlow				

Main Conference Overview

Time	Wednesday	Thursday	Friday	Location
Plenaries (8:30-10:30)	Paul Clements	Margaret-Anne Storey	Joelle Pineau	Place du Canada
Break (10:30-11:00)	Parc Mont-Royal, Square Dorchester, Square Victoria, Foyer			
Sessions (11:00-12:30)	Mining Software	Software Analytics	ML in Analysis	Place du Canada
	Program Repair	Unit Testing	Defect Prediction	Laurier
	Static Analysis	Technical Briefing	Developer Biases	Viger
	Test Effectiveness	Tool Taxonomy and Adoption	Fuzzing	Duluth
	Security	Requirements	SPLs	Van-Horne
	SEET	SEET	SEET	Ste.-Catherine
	Controlled Experiments	Continuous Delivery	Concurrency	Notre-Dame
	Technical Briefing	ACM SRC	Technical Briefing	Sherbrooke
	Tutorial	Process & Project Management	Mining Software Changes	Centre-Ville
Lunch (12:30-14:00)	Parc Mont-Royal, Square Dorchester, Square Victoria, Foyer			
Sessions (14:00-15:30)	Test Generation	Trends & Challenges	Testing AI Sys	Place du Canada
	Debugging	Program Repair	SEIS Keynote	Laurier
	Continuous Integration	Technical Briefing	Crowdsourcing	Viger
	Security	Dependencies	API Analysis	Duluth
	SEIS	Requirements	Specs and Models	Van-Horne
	IoT/Cooperative Sys	Crowdsourced Knowledge	Performance	Ste.-Catherine
	SEET	SEET	SEET	Notre-Dame
	DevOps & Logging	SEIS	IDEs	Sherbrooke
	Tutorial	Tutorial	Human Factors	Centre-Ville
Break (15:30-16:00)	Parc Mont-Royal, Square Dorchester, Square Victoria, Foyer			
Sessions (16:00-18:00)	Studying Developers	Awards Plenary	Domain-specific Testing & Analysis	Place du Canada
	Analysis & Verification		Code Reviews	Laurier
	SE Datasets		Software Quality	Viger
	Test Prioritization		APIs	Duluth
	Models		Transformations	Van-Horne
	Program Comprehension		Reverse Engineering	Ste.-Catherine
	Agile Development		Energy Consumption	Notre-Dame
	Mobile Apps		Configuration	Sherbrooke
	Tutorial	Tutorial	Documentation	Centre-Ville
SCR Posters 14:00-18:00 Town Hall 18:15-19:30 Reception 19:30-21:30				
Posters 9:00-18:00 Banquet 19:30-00:00		Demos 9:00-18:00 Closing 17:30-18:00		

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On behalf of the ICSE 2019 Organizing Committee, we are delighted to welcome you to Montréal for the 41st ACM/IEEE International Conference on Software Engineering. This is the third time that ICSE is held in Canada, having been held in Toronto in 2001 and in Vancouver in 2009. It is particularly apt for Montréal to host ICSE, because the city has an exceptionally large local software-engineering research community, and is home to a thriving ICT sector that comprises roughly 5000 companies.

After 40 years, ICSE continues to be the premier software-engineering conference, where researchers, practitioners, and educators come together to present, discuss, and debate the most recent research results, innovations, trends, and concerns in the field of software engineering. ICSE 2019 has a rich and diverse program, with many familiar themes as well as several new initiatives.


Pre-conference Meetings: ICSE's main conference is preceded by four days of co-located conferences, workshops, and mentoring events. Co-located conferences are independent conferences and symposia that have chosen to be part of the ICSE conference week. Each event focuses on a special topic within software engineering. Nine conferences are co-located with ICSE this year: **FormalISE**, **ICGSE**, **ICPC**, **ICSSP**, **MOBILESoft**, **MSR**, **OSS**, **SEAMS**, and **TechDebt**. Pre-conference meetings also include 27 workshops that provide forums for small-group discussions on topics in software engineering research and practice.






Mentoring Events: ICSE has a tradition of mentoring its next generation of researchers through various small-group meetings of junior and established researchers. The **Doctoral Symposium** provides students with constructive feedback on their dissertation research. The **New Faculty Symposium** provides guidance to new faculty members on different facets of an academic career and how to navigate them successfully. New this year: a **Student Mentoring Workshop (SMeW)**, for undergraduates and first- and second-year graduate students, aims to de-mystify PhD research and to promote graduate studies and research careers. More than half of the SMeW participants have received support to attend the first day of the main conference. Please help us to make them feel welcome! Also new this year: first-time ICSE attendees were invited to a **Newcomers Reception** to meet attendees who have similar research interests.

Main Conference: This year's main conference is one of the largest ever, with over 300 paper presentations. Paper presentations from the Technical, SEIP, NIER, Demonstrations, and Journal-First tracks are combined into **blended sessions** that are organized by topic rather than by track. (SEET and SEIS are their own topics, and thus have their own sessions). Between paper presentations, tutorials, technical briefings, and the ACM Student Research Competition, there are nine sessions running in parallel – plus posters and live demos. There is enough variety for anyone to find something of interest!


Keynotes: We are especially pleased to welcome three distinguished plenary keynote speakers: **Paul Clements** (BigLever Software) explores the foundations of product-line engineering and what it means to build software that is flexible enough to satisfy different needs for different users, in a way that saves companies tens to hundreds of millions of dollars annually. **Margaret-Anne Storey** (University of Victoria) invites us to question the impact that software-engineering research has on developer productivity, and how that impact might be improved. **Joelle Pineau** (McGill University / Facebook) discusses one of the key challenges of AI software – reproducibility – and offers some guidelines for making machine-learning software more reproducible, reusable, and robust. We are pleased also to welcome **Steve Easterbrook** (University of Toronto) as the SEIS keynote speaker. He explores the role and impact of software experiments in research on climate change.

Technical Track: The Technical Track received 529 paper submissions covering 51 research topics written by 1738 authors from 45 countries. Of the 529 submissions we received, 25 were desk rejected, either for violation of the double-blind rules or incorrect formatting. Each of the remaining 504 papers was reviewed by at least three PC members, and its online discussion and decision was overseen by a member of the PB. Authors were allowed to read and submit a response to the reviews during the author-response period. The majority of papers, 439, were decided on by reaching consensus among the reviewers during online discussions. For the 65 papers whose decisions could not be reached by easy consensus, each was assigned to two additional PB members to provide further input and stimulate further discussion. Decisions on these papers were finalized during a two-day online meeting in which all PB and PC members were asked to participate. Over the course of the entire online review process, around 25,000 messages were exchanged, including all comments, review submissions, and emails.

In the end, a record-number 109 papers were accepted out of 529 submissions, which is an acceptance rate of 21%. Of these, 11 papers were selected as ACM Distinguished Papers and are identified in the program by award badges: 

New this year: authors of accepted papers were invited to submit supporting artifacts, which were evaluated by the **Artifacts Evaluation** committee. The papers with successful artifact submissions are identified in the program schedule with ACM Artifacts badge:     

Software Engineering in Practice (SEIP) Track: The SEIP Track solicited paper presentations, talk proposals and, for the first time, interactive sessions. We received a record-number 135 submissions, from which we selected 30 papers, 5 talks, and 1 interactive session. Each accepted paper was reviewed by at least three members of the track's PC, followed by a lengthy, and occasionally passionate, online discussion phase, and an online PC meeting for final decisions. Each talk proposal and interactive session was reviewed in two phases. First, a two-page abstract was reviewed by at least three PC members. After an online discussion, a select group of authors were invited to submit complete talk and interactive-session descriptions. After review and online discussion of these second-phase submissions, the PC chairs made final decisions.

Industry Program: The Industry Program comprises all of the papers and talks that ICSE chairs and reviewers felt would appeal to attendees from industry. These include all SEIP presentations as well as industry-relevant papers from other tracks. There are **hands-on tutorials** on leading-edge technologies (TensorFlow, Kubernetes, R+Python for big data, R for SE researchers, Presentations 101) delivered by experts in the field. There is an industry-student networking lunch on Wednesday for all students and attendees from our corporate sponsors. Lastly, ICSE attendees have been sharing their CV/Resume with ICSE corporate sponsors, via a **resume database**. Look for the entries in the main conference program annotated with the Industry Program badge: 

Technical Briefings: The main conference program includes invited talks in the form of Technical Briefings that highlight current trends and challenges in specific domains of software engineering. **Mik Kersten** (Tasktop) discusses tool and analytics support for software delivery. **Yingnong Dang**, **Qingwei Lin**, and **Peng Huang** (Microsoft) present AIOps – the application of artificial intelligence and machine learning to

improve engineers' ability to build and operate online services efficiently and effectively. **Krzysztof Czarnecki** (University of Waterloo) reviews current industry practices for building automated vehicles, and analyzes how software engineering needs to be adapted for their development. **Magy Seif El-Nasr** (Northeastern University) explores the use of data in the development of games, including how data can be used to derive insights and design action items. Look for their presentations in the conference program!

Awards: On Thursday afternoon, there is an Awards plenary session in which the awardees of the Most Influential Paper Award – **Westley Weimer, ThanhVu Nguyen, Claire Le Goues, and Stephanie Forrest**– reflect on their ICSE 2009 paper titled *Automatically Finding Patches Using Genetic Programming* and on current trends in automated repair of software systems. A second plenary will be given by **Mark Harman**, who is the recipient of this year's ACM SIGSOFT Outstanding Research Award *and* the recipient of this year's Harlan D. Mills Award – in recognition of his ground-breaking contributions in establishing the research areas of search-based software engineering and genetic improvement of software, and in reigniting research in slicing.

Conference Badges: There is a lot of information encoded in your conference badge this year. Most obvious is the addition of your research interests – listing research areas on badges will hopefully help you identify researchers in your area who are unknown to you, and will facilitate networking. The background on your badge is a distinct segment from the conference logo, and your segment indicates whether you are an academic, a student, or from industry. Lastly the number of points on the star in the centre of your badge indicates whether you are a first-time ICSE attendee (5 points) or are an experienced attendee of many ICSEs (32 points).

Please join us in thanking the many, many volunteers who have helped to create and deliver ICSE 2019. We are especially grateful to the members of the Organizing Committee – a dream team of volunteers from Canada and around the world, who have contributed a tremendous amount of time and effort over the last four years. We are deeply grateful to the Program Chairs of the various tracks, the General and Program Chairs of the co-located events and workshops, and the members of their respective program committees for the large amount of effort and care they put into their reviews and discussion. Together, they have curated an exceptional week of conference programming and events for ICSE attendees.

Welcome Letter

A special thank you goes to the Finance Chair, the Conference Chairs and local team, the Workshop Chairs and Co-located Events Chair, the Web Chairs, the Registration Chair, the Proceedings Chairs, the Publications Chair, the Student Volunteers Chairs and their team, and the Publicity and Social Media Chairs – all of whom worked much harder than you will ever imagine (harder than they ever imagined!) to put on a high-quality conference. The names of many of these volunteers appear on the following pages, and throughout the set of conference proceedings.

We would like to thank IEEE CS and its Technical Committee on Software Engineering (TCSE), and ACM and its Special Interest Group on Software Engineering (SIGSOFT), for their continued sponsorship of ICSE. We are also deeply grateful to our corporate sponsors for their generous support: National Science Foundation (NSF), Facebook, IBM, Huawei, Monash University, University of Waterloo, École de Technologie Supérieure (ÉTS), Amazon Web Services, Tourisme Montréal, Google, Microsoft Research, Blackberry, Fujitsu, University of California, Santa Barbara, ING, Natural Sciences and Engineering Research Council of Canada (NSERC), Prompt, and Wiley.

Finally, thank you to all of the authors and speakers for your contributions to ICSE week. You are the reason why ICSE is the premier conference in software engineering!

Enjoy the conference! We hope you find lots of interesting sessions and speakers in the technical program, and that you find lots of opportunities for discussions and networking in the social program.

Bienvenue à Montréal!

Joanne M. Atlee
ICSE 2019 General Chair

Tevfik Bultan and Jon Whittle
ICSE 2019 Technical Track Program Chairs

Helen Sharp and Michael Whalen
ICSE 2019 Software Engineering in Practice Program Chairs

Paul Clements

Managing Variation: An Industrial Perspective on Product Line Engineering

Plenary: Wednesday, May 29; 9:00-10:30am; Place du Canada

If nothing endures but change, then to make the products of our labor enduring, we must build them to accommodate change. If they cannot, they will be cast aside. Change can be thought of as occupying a time window: A solution needs to do something different a year from now, and then something different from that six months later, and so forth. An extremely interesting special case is when that time window shrinks to zero: Our solution needs to do and be a dozen different things right now. In many sectors, that special case turns out to be, in fact, the most common case. The so-called general case, where a single solution evolves over time, turns out to be a less interesting special case. This talk explores the foundations for the field of product-line engineering, which is the engineering of a family of systems that are similar but vary from each other, explores various techniques for handling this need, from the earliest to the most up-to-date, and shows how the approaches transcend not just software but apply across all engineering disciplines and all levels of an enterprise. Finally, it relates how this concept is being applied in industry today, and shows where it is saving companies tens to hundreds of millions of dollars annually.



Dr. Paul Clements is the Vice President of Customer Success at BigLever Software, Inc., where he works to spread the industrial adoption of systems and product line engineering. Prior to this, he was a senior member of the technical staff at Carnegie Mellon University's Software Engineering Institute, where for 17 years he worked leading or co-leading projects in product-line engineering and software architecture documentation and analysis. Prior to joining the SEI, he was a computer scientist with the U.S. Naval Research Laboratory in Washington, D.C. Clements is the co-author of three practitioner-oriented books about software architecture: "Software Architecture in Practice" (three editions), "Evaluating Software Architectures: Methods and Case Studies," and "Documenting Software Architectures: View and Beyond" (two editions). He also co-wrote "Software Product Lines: Practices and Patterns," and was co-author and editor of "Constructing Superior Software" (1999). He has also authored dozens of papers in software and systems engineering reflecting his long-standing interest in the design and specification of challenging system solutions. He was a founding member of the IFIP WG2.10 Working Group on Software Architecture.

Margaret-Anne Storey

Publish or Perish: Questioning the Impact of Our Research on the Software Developer

Plenary: Thursday, May 30; 9:00-10:30am; Place du Canada

How often do we pause to consider how we, as a community, decide which developer problems we address, or how well we are doing at evaluating our solutions within real development contexts? Many of our research contributions in software engineering can be considered as purely technical. Yet somewhere, at some time, a software developer may be impacted by our research. In this talk, I invite the community to question the impact of our research on software-developer productivity. To guide the discussion, I first paint a picture of the modern-day developer and the challenges they experience. I then present 4+1 views of software engineering research – views that concern research context, method choice, research paradigms, theoretical knowledge and real-world impact. I demonstrate how these views can be used to design, communicate and distinguish individual studies, but also how they can be used to compose a critical perspective of our research at a community level. To conclude, I propose structural changes to our collective research and publishing activities – changes to provoke a more expeditious consideration of the many challenges facing today's software developer.



Dr. Margaret-Anne Storey is a Professor of Computer Science and the Co-Director of the Matrix Institute for Applied Data Science at the University of Victoria. She holds a Canada Research Chair in Human and Social Aspects of Software Engineering and is a member of the Royal Society of Canada's College of New Scholars, Artists and Scientists. She held the Lise Meitner Guest Professorship at Lund University in Sweden from 2016 to 2018, a professorship that promotes gender diversity in science. Together with her students and collaborators, she seeks to understand how software tools, communication media, data visualizations, and social theories can be leveraged to improve how software engineers and knowledge workers explore, understand, analyze and share complex information and knowledge. She has published widely on these topics and collaborates extensively with high-tech companies and non-profit organizations to ensure real-world applicability of her research contributions and tools. Over the past several years, she has collaborated with product teams and researchers at Microsoft to understand developer satisfaction and developer productivity, with the goal of improving their engineering systems and processes.

Joelle Pineau

Building Reproducible, Reusable, and Robust Machine Learning Software

Plenary: Friday, May 31; 9:00-10:30am; Place du Canada

We have seen significant achievements with machine learning in recent years. Yet reproducing results for state-of-the-art deep learning methods is seldom straightforward. High variance of some methods can make learning particularly difficult. Furthermore, results can be brittle to even minor perturbations in the domain or experimental procedure. In this talk, I review challenges that arise in experimental techniques and reporting procedures in deep learning, with a particular focus on reinforcement learning. I also describe several recent results and guidelines designed to make future results more reproducible, reusable and robust.



Dr. Joelle Pineau is an Associate Professor and William Dawson Scholar at McGill University where she co-directs the Reasoning and Learning Lab. She also leads the Facebook AI Research lab in Montreal, Canada. She holds a BAsC in Engineering from the University of Waterloo, and an MSc and PhD in Robotics from Carnegie Mellon University. Dr. Pineau's research focuses on developing new models and algorithms for planning and learning in complex partially-observable domains. She also works on applying these algorithms to complex problems in robotics, health care, games and conversational agents. She serves on the editorial board of the Journal of Artificial Intelligence Research and the Journal of Machine Learning Research and is currently President of the International Machine Learning Society. She is a recipient of NSERC's E.W.R. Steacie Memorial Fellowship (2018), a Fellow of the Association for the Advancement of Artificial Intelligence (AAAI), a Senior Fellow of the Canadian Institute for Advanced Research (CIFAR) and in 2016 was named a member of the College of New Scholars, Artists and Scientists by the Royal Society of Canada.

Mark Harman

The Joys and Frustrations of Software Engineering

Harlan Mills / ACM SIGSOFT Outstanding Research Award

Thursday, May 30; 17:00-18:00; Place du Canada

In this keynote, I talk about research and deployment work on source code analysis, testing and Search-Based Software Engineering (SBSE), which I have undertaken with the many wonderful collaborators, colleagues and friends. I talk about my personal view on the joys of scientific research and the excitement of deployment, but also the frustrations of both. I think frustration is important needs to be acknowledged, because it often leads to further insights and development and is, thereby, the root cause of future joys. I allow plenty of time for questions and discussion.



Dr. Mark Harman works full time at Facebook London and also holds a part-time professorship at UCL. At Facebook, he works with the Sapienz team. Sapienz has been deployed to test mobile apps, leading to thousands of bugs being automatically found in multimillion-line communications and social-media apps in use by over 1.4Bn people worldwide. He is known for his scientific work on Search-Based Software Engineering (SBSE), source code analysis, software testing, app store analysis and empirical software engineering. He co-founded the field SBSE, a research area with authors spread over more than 40 countries. In addition to Facebook itself, Mark's scientific work is also supported by an ERC advanced fellowship grant and by the UK EPSRC funding council.

Wes Weimer, ThanhVu Nguyen, Claire Le Goues and Stephanie Forrest

It Does What You Say, Not What You Mean: Lessons From A Decade of Program Repair

Most Influential Paper ICSE N-10

Thursday, May 30; 16:10-17:00; Place du Canada

In this talk, we present lessons learned, good ideas, and thoughts on the future, with an eye toward informing junior researchers about the realities and opportunities of a long-running project. We highlight some notions from the original paper that stood the test of time, some that were not as prescient, and some that became more relevant as industrial practice advanced. We place the work in context, highlighting perceptions from software engineering and evolutionary computing, then and now, of how program repair could possibly work. We discuss the importance of measurable benchmarks and reproducible research in bringing scientists together and advancing the area. We give our thoughts on the role of quality requirements and properties in program repair. From testing to metrics to scalability to human factors to technology transfer, software repair touches many aspects of software engineering, and we hope a behind-the-scenes exploration of some of our struggles and successes may benefit researchers pursuing new projects.

Dr. Wes Weimer is a Professor at the University of Michigan. His main research interests include static, dynamic, and medical imaging-based techniques to improve program quality, fix defects, and understand how humans engineer software.

Dr. ThanhVu Nguyen is an Assistant Professor in computer science at the University of Nebraska-Lincoln. His research focuses on using dynamic and symbolic techniques to analyze programs.

Dr. Claire Le Goues is an Assistant Professor of Computer Science at Carnegie Mellon University, where her primary departmental affiliation is with the Institute for Software Research. Her research lies at the intersection of software engineering and programming languages, focussing especially on how to automatically debug and improve real-world software systems.

Dr. Stephanie Forrest is a computer science Professor at Arizona State University, where she also directs the Biodesign Center for Biocomputation, Security and Society. Her research focuses on the intersection of biology and computation, including cybersecurity, software engineering, and biological modeling.



Steve Easterbrook

Terraforming Earth: Will Software Experiments Guide Us out of the Climate Crisis?

SEIS Keynote-Friday May 31; 14:00-15:30; Laurier

The history of climate science is closely tied to the history of computing. From the first computational weather forecasts developed by von Neumann and Charney to run on ENIAC, to the earth system models used to produce projections of future climate change for the most recent IPCC reports, climate scientists have always pushed the limits of computational modelling. Along the way, climate scientists have developed a sophisticated set of software development practices tailored to the needs of a science in which virtual experiments are essential for understanding the relationships between human activity and the global climate system. In this talk, I first explain what climate models do, via a quick tour of the history of climate modelling. I then show how a core set of software development practices is used to support a culture of scientific experimentation which provides robust answers to societally important questions. I end the talk with an overview of the current generation of climate model experiments. These address critically important questions such as whether there are still viable pathways to deliver the UN's commitment to constrain global warming to no more than +2°C, and whether geo-engineering can buy us more time to address the underlying causes of climate change.



Dr. Steve Easterbrook is the Director of the School of the Environment and a Professor of Computer Science at the University of Toronto. He received his Ph.D. (1991) in Computing from Imperial College in London (UK), and joined the faculty at the School of Cognitive and Computing Science, University of Sussex. From 1995-99, he was lead scientist at NASA's Independent Verification and Validation (IV&V) Facility in West Virginia, where he investigated software verification on the Space Shuttle Flight Software, the International Space Station, and the Earth Observation System. He moved to the University of Toronto in 1999. His research interests range from modelling and analysis of complex adaptive systems to the socio-cognitive aspects of team interaction. His current research is in sustainability informatics, where he studies how climate scientists develop computational models to improve their understanding of earth systems and climate change, the broader question of how that knowledge is shared with other communities, and the role of digital technologies in the transition to a post-carbon world. He has been a visiting scientist at the UK Met Office Hadley Centre, in Exeter; the National Centre for Atmospheric Research in Boulder, Colorado; the Max-Planck Institute for Meteorology, in Hamburg; and the Institute Pierre Simon Laplace in Paris.

ICSE 2019 Technical Briefings offer conference attendees the opportunity to gain new insight, knowledge, and skills in select software engineering areas of topical importance today. Four technical briefings, each 90 minutes in length and aimed at both industrial and academic participants, are integrated into main conference program.

Analyzing Flow to Measure Value in Software Delivery

Mik Kersten (Tasktop)

Wednesday, May 29; 11:00am-12:30pm; Sherbrooke

Projects, organization charts and software architecture are the best representations of value creation we have today. They are insufficient to support the scale and complexity of the software that is powering more and more of the world economy.

In this talk, Dr. Kersten proposes a new set of abstractions for understanding and improving how software is built. He introduces the concept of Value Stream Networks, which provide a set of models that span beyond the software architecture to include all of the artifacts involved in building software, from business idea to customer support. He then shows how we can visualize and operate on this new model in order to gain insights into the ground truth of what flows through organizations delivering software, and how we can improve that flow using the Flow Framework(tm). Kersten summarizes his experiences from open source, building a successful startup, and supporting some of the largest Agile and DevOps transformations in order to propose ideas for the research and practices still needed to better understand and manage software delivery at scale.



Dr. Mik Kersten started his career as a Research Scientist at Xerox PARC where he created the first aspect-oriented development environment. He then pioneered the integration of development tools with Agile and DevOps as part of his Computer Science PhD at the University of British Columbia. Founding Tasktop out of that research, Mik has written over one million lines of open-source code that are still in use today, and he has brought seven successful open-source and commercial products to market. Mik's experiences working with some of the largest digital transformations in the world has led him to identify the critical disconnect between business leaders and technologists. Since then, Mik has been working on creating new tools and a new framework for connecting software value stream networks and enabling the shift from project to product.

AIOps: Real-World Challenges and Research Innovations

Yingnong Dang, Qingwei Lin, Peng Huang (Microsoft)

Thursday, May 30; 11:00am-12:30pm; Viger

AIOps is about empowering software and service engineers (e.g., developers, program managers, support engineers, site reliability engineers) to efficiently and effectively build and operate online services and applications at scale with artificial intelligence (AI) and machine learning (ML) techniques. AIOps can help improve service quality and customer satisfaction, boost engineering productivity, and reduce operational cost.

In this technical briefing, we first summarize the real-world challenges in building AIOps solutions based on our practice and experience in Microsoft. We then propose a roadmap of AIOps related research directions, and share a few successful AIOps solutions we have built for Microsoft service products.

Dr. Yingnong Dang is a Principal Data Scientist Manager at Microsoft Azure. Yingnong is responsible of building innovative analytics and ML solutions for improving Azure Infrastructure availability and capacity, boosting engineering productivity, and increasing customer satisfaction. Yingnong's team has close partnership with Microsoft Research and the academia.

Dr. Qingwei Lin Joined Microsoft Research in 2006, and is now a Lead Researcher in DKI (Data Knowledge Intelligence) area of Microsoft Research. Qingwei worked on data-driven technologies for service intelligence, using machine learning and data mining algorithms. Qingwei hosted Microsoft company-wide "Service Intelligence" workshop as the Chair for 4 consecutive years.

Dr. Peng Huang is an Assistant Professor at the Johns Hopkins University Computer Science department. His research interests lie broadly in computer systems, programming language, and software engineering. His co-authored paper received the Best Paper Award at OSDI '16. Dr. Huang received his MS and PhD from UC San Diego.



Software Engineering for Automated Vehicles: Addressing the Needs of Cars that Run on Software and Data

Krzysztof Czarnecki (University of Waterloo)

Thursday, May 30; 14:00-15:30; Viger

Automated vehicles are AI-based safety-critical robots that fulfill transportation needs while interacting with the general public in traffic.

This technical briefing gives an overview of how such systems work and analyzes how software engineering needs to be adapted for their development. Software engineering for automated vehicles requires a DevOps-style process with special considerations for functions based on machine learning and incremental safety assurance at vehicle and fleet level. The briefing reviews current industry practices and discusses opportunities for future research.



Dr. Krzysztof Czarnecki is a Professor of Electrical and Computer Engineering at the University of Waterloo. Before coming to Waterloo, he was a researcher at DaimlerChrysler Research (1995-2002), Germany, focusing on improving software development practices and technologies in enterprise, automotive, and aerospace sectors. While at Waterloo, he held the NSERC/Bank of Nova Scotia Industrial Research Chair in Requirements Engineering of Service-oriented Software Systems (2008-2013) and has worked on methods and tools for engineering complex software-intensive systems. He received the Premier's Research Excellence Award in 2004 and the British Computing Society in Upper Canada Award for Outstanding Contributions to IT Industry in 2008. He has also received seven Best Paper Awards, two ACM Distinguished Paper Awards, and one Most Influential Paper Award. His current research focuses on autonomous driving and the safety of systems that rely on artificial intelligence. He serves on Society of Automotive Engineers task forces on level of driving automation, reference architecture for automated driving systems, and manoeuvres and behaviours. As part of this research, he co-leads the development of UW Moose, Canada's first self-driving research vehicle (autonomoose.net).

Developing Games that Capture and Engage Users

Magy Seif El-Nasr (Northeastern University)

Friday, May 31; 11:00am-12:30pm; Sherbrooke

Developing games that can capture and engage users is not an easy process. There is no one set process to accomplish this goal. Currently the game industry is increasing in terms of size, delivering a variety of games, and adopting many different business and software development models. One trend that started to appear in the recent years is the use of data to guide the design process and provide insights on all different aspects of development, including software work processes, usability, monetization, and marketing, to mention a few.



In this technical briefing, I concentrate on the role of data in the game software development process and how data can be used to derive insights and design action items. I use case studies of collaborative work we have accomplished with different game companies and a variety of game types, as examples to demonstrate the utility of the approach.

Dr. Magy Seif El-Nasr is an Associate Professor in the Khoury College of Computer and Information Sciences and Arts, Media and Design, where she directs the GUII (Game User Intelligence and Interaction) Lab. Dr. Seif El-Nasr earned her Ph.D. from Northwestern University in Computer Science. Her research focuses on two goals (a) developing automated tools and techniques for authoring, adapting, and personalizing virtual environments (e.g., interactive narrative, believable characters, and visuals), and (b) developing methodologies to model and understand players' behaviors and motivations through the development of novel mixed-methods approaches that use machine learning and visualization tools. She published the first book on the subject of game data science, called *Game Analytics: Maximizing the Value of Player Data*.

Her work is internationally known and cited in several game industry books, including *Programming Believable Characters for Computer Games* (Game Development Series) and *Real-time Cinematography for Games*. She has received several awards and recognition within the game research community. Notably, she received four Best Paper Awards and several citations in industry books and magazines. She is on the editorial board of: *IEEE Transactions on Computational Intelligence and Artificial Intelligence in Games* and *IEEE Transactions on Affective Computing*.

Co-located Events

Co-located events are independent conferences and symposia that have chosen to be part of the ICSE conference week. Each event focuses on a special topic within software engineering.

Acronym	Full Name	Date	Location
FormaliSE	7 th International Conference on Formal Methods in Software Engineering	May 27	Sainte-Catherine
ICGSE	14 th ACM/IEEE International Conference on Global Software Engineering	May 24-26	Van-Horne and Crescent
ICPC	27 th IEEE/ACM International Conference on Program Comprehension	May 25-26	Laurier
ICSSP	International Conference on Software and Systems Process	May 25- 26	Sainte-Catherine
MOBILESoft	6 th IEEE/ACM International Conference on Mobile Software Engineering and Systems	May 25-26	Saint-Paul
MSR	16 th International Conference on Mining Software Repositories	May 26-27	Centre-Ville and Place du Canada
OSS	15 th International Conference on Open Source Systems	May 26-27	Mansfield
SEAMS	14 th Symposium on Software Engineering for Adaptive and Self-Managing Systems	May 25-26	Duluth
TechDebt	International Conference on Technical Debt	May 26-27	Viger

ICSE workshops provide forums for small-group discussions on topics in software engineering research and practice. Workshops also provide opportunities for researchers to exchange and discuss scientific and engineering ideas at an early stage. ICSE 2019 has 27 workshops; each is one or two days long and will be held before the main conference.

Acronym	Full Name	Date	Location
AST	14 th IEEE/ACM International Workshop on Automation of Software Test	May 27	Saint-Paul
BotSE	1 st International Workshop on Bots in Software Engineering	May 28	Duluth
CESSER-IP	Joint 7 th International Workshop on Conducting Empirical Studies in Industry (CESI) and 6 th International Workshop on Software Engineering Research and Industrial Practice (SER&IP)	May 28	Saint-Paul
CHASE	12 th International Workshop on Cooperative and Human Aspects of Software Engineering	May 27	Laurier
DeepTest	1 st International Workshop on Testing for Deep Learning and Deep Learning for Testing	May 28	Laurier
ECASE	2 nd International Workshop on Establishing the Community-Wide Infrastructure for Architecture-Based Software Engineering	May 27	Barre Oblique
EMIP	6 th International Workshop on Eye Movements in Programming	May 27	Parenthèse
GE	2 nd Workshop on Gender Equality in Software Engineering	May 27	Saint-Denis

Continue...

Workshops

Acronym	Full Name	Date	Location
GI	6 th International Workshop on Genetic Improvement	May 28	Crescent
IWoR	3 rd International Workshop on Refactoring	May 28	Saint-Denis
MET	4 th International Workshop on Metamorphic Testing	May 26	Saint-Denis
MiSE	11 th Workshop on Modelling in Software Engineering	May 26-27	Van-Horne
RAISE	7 th International Workshop on Realizing Artificial Intelligence Synergies in Software Engineering	May 28	Viger
RCoSE/ DDrEE	Joint 4 th International Workshop on Rapid Continuous Software Engineering and 1 st International Workshop on Data-Driven Decisions, Experimentation and Evolution	May 27	Multiplication
RET	6 th International Workshop on Requirements Engineering and Testing	May 28	Parenthèse
RoSE	2 nd International Workshop on Robotics Software Engineering	May 27	Notre-Dame
SBST	12 th International Workshop on Search-Based Software Testing	May 27	Dièse

Acronym	Full Name	Date	Location
SE4Science	2019 International Workshop on Software Engineering for Science	May 28	Arobase
SEH	1 st International Workshop on Software Engineering for Healthcare	May 27	Crescent
SEiA	Software Engineering in Africa	May 28	Copier
SEmotion	4 th International Workshop on Emotion Awareness in Software Engineering	May 28	Sainte-Catherine
SERP4IoT	1 st International Workshop on Software Engineering Research & Practices for the Internet of Things	May 27	Duluth
SEsCPS	5 th International Workshop on Software Engineering for Smart Cyber-Physical Systems	May 28	Notre-Dame
SESoS/ WDES	Joint 7 th ICSE International Workshop on Software Engineering for Systems-of-Systems and 13 th Workshop on Distributed Software Development, Software Ecosystems and Systems-of-Systems	May 28	Barre Oblique
SoHeal	2 nd International Workshop on Software Health	May 28	Multiplication
SST	10 th International Workshop on Software and Systems Traceability	May 27	Sherbrooke
WETSEB	2 nd Workshop on Emerging Trends in Software Engineering for Blockchain	May 27	Arobase

The New Faculty Symposium (NFS) aims to help new faculty members launch successful careers. The symposium facilitates conversations between prospective and junior faculty and experienced faculty members, through a series of short talks covering the broad range of issues faced by them. There is also plenty of time for informal interactions. In 2019, we sought to engage the broader Software Engineering community by collecting common questions from junior faculty, answers to those questions from senior faculty, and then curated a set of frequently asked questions that can serve as a reference.

Opening (Mansfield)

8:30 Natalia Juristo and Matthew Dwyer

Time Presentation

8:45 Hiring Promotion and Career Advancement
Arie van Deursen

9:30 Publication Strategies and Practices
Mauro Pezzè

10:15 Interactive Session I: Group Brainstorming on Specific Challenge
Jin L.C. Guo

Coffee Break (10:30-11:00)

11:00 Building a Collaborative Research Network
Myra Cohen

11:45 Building and Supporting a Research Program
Gail Murphy

Lunch (12:30-14:00)

14:00 Interactive Session II: Group Brainstorming on Specific Challenge
Austin Henley

14:20 Student Recruiting, Advising and Mentoring
Sebastian Elbaum

15:05 Interactive Session III: Group Brainstorming on Specific Challenge
Pilar Rodriguez

Coffee Break (15:30-16:00)

16:00 Teaching and Instructional Work
Patricia Lago

16:45 Faculty Life and Well-being
Jon Whittle

We gratefully acknowledge the support of the U.S. National Science Foundation for making it possible to offer travel awards to participants of ICSE's Mentoring Events (NFS, DS, SMew), through NSF grant #1922878. The opinions, findings, and conclusions expressed at the conference do not necessarily reflect the views of the National Science Foundation.

The Doctoral Symposium (DS) brings together doctoral students working on foundations, techniques, tools, and applications of software engineering and gives them the opportunity to present and discuss their research in a constructive and confidential environment. The goals of the DS are to: (i) provide the participants independent and constructive feedback on their current and future research directions, (ii) develop a supportive community of scholars and a spirit of collaborative research, and (iii) provide an opportunity for student participants to interact with established researchers and practitioners in the Software Engineering community.

Opening (Sherbrooke)

8:30 Silvia Abrahão and Laurie Williams

Keynote

9:00 How I Hacked My Way into Academia
Diomidis Spinellis (Athens University of Economics and Business)

Poster Teasers

Time	Presentation
10:00	Towards Just-In-Time Rational Refactoring <i>Jevgenija Pantiuchina (Università della Svizzera italiana)</i>
10:04	Leveraging Developer Discussions to Make Design Accessible <i>Giovanni Viviani (University of British Columbia)</i>
10:08	Effects of Automated Static Analysis Tools: A Multidimensional View on Quality Evolution <i>Alexander Trautsch (University of Göttingen)</i>
10:12	SReYantra: Automated Software Requirement Inter-dependencies Elicitation, Analysis and Learning <i>Gouri Deshpande (University of Calgary)</i>
10:16	Supporting the Acquisition of Programming Skills with Program Construction Patterns <i>Max Kesselbacher (University of Klagenfurt)</i>
10:20	INDIRECT: Intent-driven Requirements-to-Code Traceability <i>Tobias Hey (Karlsruhe Institute of Technology)</i>
10:24	Detecting, Understanding and Resolving Build and Test Conflicts <i>Leuson Da Silva (Federal University of Pernambuco)</i>

Coffee Break (10:30-11:00)

Session I


Time	Presentation
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| 11:00 | Improving the Software Logging Practices in DevOps
<i>Boyuan Chen (York University)</i> |
| 11:22 | Feedback in Scrum: Data-Informed Retrospectives
<i>Christoph Matthies (Hasso Plattner Institute, University of Potsdam)</i> |
| 11:45 | Digital Nudges for Encouraging Developer Actions
<i>Chris Brown (North Carolina State University)</i> |
| 12:07 | Stuck in The Middle: Removing Obstacles to New Program Features through Batch Refactoring
<i>Eduardo Fernandes (Pontifical Catholic University of Rio de Janeiro)</i> |

Lunch: Networking and Posters (12:30-14:00)

Session II

Time	Presentation
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| 14:00 | Towards a More Reliable Interpretation of Defect Models
<i>Jirayus Jiarapakdee (The University of Adelaide)</i> |
| 14:22 | An Artificial Intelligence-based Model-driven Approach for Exposing Off-Nominal Behaviors
<i>Kaushik Madala (University of North Texas)</i> |
| 14:45 | Mobile-App Analysis and Instrumentation Techniques Reimagined with DECREE
<i>Yixue Zhao (University of Southern California)</i> |
| 15:07 | Automated Fine-Grained Requirements-to-Code Traceability Link Recovery
 <i>Juan Manuel Florez (The University of Texas at Dallas)</i> |

Coffee Break (15:30-16:00)

Session III

Time	Presentation
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| 16:00 | Supporting Code Search with Context-Aware, Analytics-Driven, Effective Query Reformulation
<i>Masud Rahman (University of Saskatchewan)</i> |
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Panel

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| 16:22 | Dos and Don'ts When Performing Doctoral Studies
<i>Daniel Amyot, Grace Lewis, Gail Murphy and Travis Breaux</i> |
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Closing

- | | |
|-------|------------------------------------|
| 17:22 | Silvia Abrahão and Laurie Williams |
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Social Events

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|-------|--------------------------------|
| 18:30 | Newcomer's Reception |
| 20:00 | DS Dinner (sponsored by Wiley) |

The Student Mentoring Workshop (SMeW) is aimed at advanced undergraduates and first/second year graduate students. The workshop program focuses on important skills for beginning researchers and offers mentoring opportunities with senior researchers at the conference.

Welcome, Overview, and Introductions (Van-Horne)

9:00 Christian Kästner, Lori Pollock and Lin Tan

Session I

Time	Presentation
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9:10	Why Pursue a Ph.D. and How to Choose a Research Area and Advisor <i>Margaret-Anne Storey</i>
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9:50	Software Engineering - What SE Researchers Do <i>Westley Weimer</i>
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Coffee Break (10:30-11:00)

Session II

Time	Presentation
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11:00	How to Navigate Graduate School Toward a Rewarding PhD <i>Denys Poshyvanyk</i>
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11:45	Establishing a Profile <i>Jonathan Bell</i>
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Mentoring Lunch (12:30-14:00)

Session III

Time	Presentation
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14:00	Publishing in Software Engineering <i>Jane Cleland-Huang</i>
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14:40	Panel Post-PhD Career: What are the Tradeoffs between a Research Career in Industry, Academia (Research Track, Teaching Track), and Government? <i>Julia Rubin, Nicholas A. Kraft, Edward Aftandilian and Michael Hilton</i>
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Coffee Break (15:30-16:00)

Session IV

Time	Presentation
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16:00	Panel of New PhDs: What I Wish I Knew When I Started My PhD in SE <i>Moritz Beller, Joshua Garcia, Sarah Nadi and Jinqiu Yang</i>
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17:20	Closing
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New this year — we have a fantastic line-up of tutorials! If you are registered for ICSE week on Tuesday/Wednesday/Thursday then you are free to attend that day's tutorials. These are **hands-on tutorials**, so bring your laptop. Check out the **prerequisites**; some tutorials ask you to download software or acquire accounts in advance. Come prepared to learn something new!

Running Applications on Kubernetes

Nathen Harvey (Google)

Tuesday, May 28, 9:00-12:30; Centre-Ville

Kubernetes (k8s) is an open-source system for automating the deployment, scaling, and management of containerized applications. Kubernetes adds an abstraction layer to an underlying deployment environment, which can be on-premises, in the cloud, or some hybrid that allows the running and migration of workloads to the most appropriate deployment environment.

In this workshop, **Nathen Harvey**, a DevOp guru at Google, provides an introduction to running applications on Kubernetes. The workshop includes a mix of lecture and hands-on labs. Participants will package a Java application into a Docker container, then deploy and manage that application in Kubernetes. This workshop utilizes a number of services provided by the Google Cloud Platform, however the concepts are portable to any environment. Participants need not install any software in advance, but should have some basic web and system administration skills.

Scale-Out Data Science with R and Python

Tomas Singliar, Mario Inchiosa, John-Mark Agosta and Hang Zhang (Microsoft)

Tuesday, May 28, 9:00-17:30; Place du Canada

Python and R dominate the domain of data science software. However, when it comes to scalable analysis, or deployment of trained models into production, barriers still exist.

In this tutorial, **Tomas Singliar**, **John-Mark Agosta**, **Hang Zhang** (Principal Data Scientists), and **Mario Inchiosa** (Principal Software Engineer) at Microsoft demonstrate how to create scalable machine-learning pipelines in R and Python with an emphasis on scaling on Spark clusters. They will model the data science journey by first prototyping locally then showing how to move the data science process to the Cloud, to leverage larger compute resources and data colocation that various Spark implementations offer. Code samples will be available in a public GitHub repository. Spark and AzureML Compute clusters will be the target distributed platforms. Participants do exercises on data science virtual machines using RStudio and Jupyter notebooks.

Prerequisites: Participants should come to the session with access to an Azure subscription. You can use Azure's free tier.

Train a Model with TensorFlow and Run It in the Browser

Josh Gordon and Robert Crowe (Google)

Tuesday, May 28, 14:00-17:30; Centre-Ville

Come join **Josh Gordon** and **Robert Crowe**, members of the TensorFlow team at Google, for an introductory TensorFlow workshop, taught at the beginner level.

After an introduction to TensorFlow, you work through several simple exercises using `tf.keras`, TensorFlow's latest and easiest to use high-level API. You train models in Python and then work through the steps needed to run them. The models run interactively, and entirely in a web browser. Next, you serve your model using a REST API. The tutorial assumes basic prior machine-learning experience, but is taught at the beginner level, and you can probably follow along even if you are entirely new to the field. Josh and Robert are available afterwards for discussions and deeper technical content if you have anything you'd like to chat about. There is no software to install. You do everything in Colaboratory: a Jupyter notebook environment.

R for Software Engineering Research

Greg Wilson (RStudio)

Wednesday, May 29, 11:00-17:30; Centre-Ville

Greg Wilson, an exceptional educator and speaker, gives a one-day tutorial that introduces participants to the statistical programming language R, and to a set of tools known as the “tidyverse” that can be used to load, clean, explore, analyze, and visualize complex data. Examples will be drawn from software engineering datasets; participants must be comfortable programming, but do not need previous exposure to R.

Prerequisites: Participants should have RStudio installed on their laptop.

Presentation 101

Michele Lanza (Università della Svizzera italiana)

Thursday, May 30, 14:00-17:30; Centre-Ville

In this hands-on tutorial, **Michele Lanza**, a Professor of Software Engineering at the Università della Svizzera italiana (USI) in Lugano, Switzerland and a frequent invited speaker, explores numerous best practices in preparing and delivering presentations. Themes include: how to structure your presentation, effective design of presentation material, how to engage your audience, body language, and the importance of rehearsal. Participants might be invited to prepare short research presentations to be studied and critiqued during the tutorial.

Opening Ceremonies (Place du Canada)

8:30 – 9:00 Joanne Atlee, Tefvik Bultan, Jon Whittle, Mike Whalen and Helen Sharp

Keynote (Place du Canada) – Mike Whalen and Helen Sharp

9:00 – 10:30 Managing Variation: An Industrial Perspective on Product Line Engineering
Paul Clements (VP of Customer Success, BigLever Software, Inc.)

Coffee Break (10:30 – 11:00)

Technical Briefing (Sherbrooke) – Sebastian Uchitel

11:00 – 12:30 Analyzing Flow to Measure Value in Software Delivery
 *Mik Kersten (CEO, TaskTop)*



Hands-On Tutorial (Centre-Ville)

11:00 – 12:30 R for Software Engineering Research
Greg Wilson (RStudio)

SEET: Industry-Relevant Teaching (Sainte-Catherine) – Ita Richardson

Time	Track	Presentation
11:00	SEET	Walking Through the Method Zoo: Does Higher Education Really Meet Software Industry Demands?, <i>Marco Kuhrmann, Joyce Nakatumba-Nabende, Rolf-Helge Schneider, Paolo Tell, Jil Klünder, Tayana Conte, Stephen MacDonell and Regina Hebig</i>
11:15	Posters	Incorporating Real Projects into a Software Engineering Undergraduate Curriculum <i>Rafael Chanin, Jorge Melegati, Afonso Sales, Mariana Detoni, Xiaofeng Wang and Rafael Prikladnicki</i>
11:21	SEET	Collaborating with Industrial Customers in a Capstone Project Course: The Customers' Perspective <i>Maria Paasivaara, Jari Vanhanen and Casper Lassenius</i>
11:36	Posters	Industry Trends in Software Engineering Education: A Systematic Mapping Study <i>Orges Cico and Letizia Jaccheri</i>
11:42	SEET	Industry-Academy Collaboration in Teaching DevOps and Continuous Delivery to Software Engineering Students: Towards Improved Industrial Relevance in Higher Education <i>Kati Kuusinen and Sofus Albertsen</i>
11:52	SEET	Facilitating Entrepreneurial Experiences through a Software Engineering Project Course <i>Håkan Burden, Jan-Philipp Steghöfer and Oskar Hagvall Svensson</i>
12:07		Discussion

Mining of Software Properties and Patterns (Place du Canada) – Julia Rubin







Time	Track	Presentation
11:00	Technical	Natural Software Revisited <i>Musfiqur Rahman, Dharani Palani and Peter Rigby</i>
11:20	Technical  	Towards Automating Precision Studies of Clone Detectors <i>Vaibhav Saini, Farima Farmahinifarahani, Yadong Lu, Di Yang, Pedro Martins, Hitesh Sajani, Pierre Baldi and Cristina Lopes</i>
11:40	Journal First	Will This Clone be Short-lived? Towards a Better Understanding of the Characteristics of Short-lived Clones <i>Patanamon Thongtanunam, Weiyi (Ian) Shang and Ahmed E. Hassan</i>
11:50	Journal First	A Systematic Literature Review on Bad Smells – 5 W's: Which, When, What, Who, Where <i>Elder Vicente De Paulo Sobrinho, Andrea De Lucia and Marcelo De Almeida Maia</i>
12:00	Journal First	Beyond Technical Aspects: How Do Community Smells Influence the Intensity of Code Smells? <i>Fabio Palomba, Damian Andrew Tamburri, Francesca Arcelli Fontana, Rocco Oliveto, Andy Zaidman and Alexander Serebrenik</i>
12:10	Journal First	On the Nature of Merge Conflicts: A Study of 2,731 Open Source Java Projects Hosted by GitHub <i>Gleiph Ghiotto, Leonardo Murta, Márcio Barros and André van der Hoek</i>
12:20		Discussion

Security 1 (Van-Horne) – Corina Pasareanu





Time	Track	Presentation
11:00	SEIP 	Interventions for Software Security: Creating a Lightweight Program of Assurance Techniques for Developers <i>Charles Weir, Lynne Blair, Ingolf Becker, M. Angela Sasse, James Noble and Awais Rashid</i>
11:20	SEIP 	Towards Better Utilizing Static Application Security Testing <i>Jinqiu Yang, Lin Tan, John Peyton and Kristofer A. Duer</i>
11:40	Technical	LEOPARD: Identifying Vulnerable Code for Vulnerability Assessment Through Program Metrics <i>Xiaoning Du, Bihuan Chen, Yuekang Li, Jianmin Guo, Yaqin Zhou, Yang Liu and Yu Jiang</i>
12:00	Journal First 	A Screening Test for Disclosed Vulnerabilities in FOSS Components <i>Stanislav Dashevskyi, Achim D. Brucker and Fabio Massacci</i>
12:10	NIER	VULTRON: Catching Vulnerable Smart Contracts Once and for All <i>Haijun Wang, Yi Li, Shang-Wei Lin, Lei Ma and Yang Liu</i>
12:20		Discussion

Continue...

Testing Effectiveness (Duluth) – Sigrid Eldh

Time	Track	Presentation
11:00	SEIP 	Practitioners' Views on Good Software Testing Practices <i>Pavneet Singh Kochhar, Xin Xia and David Lo</i>
11:20	SEIP 	Perception and Practices of Differential Testing <i>Muhammad Ali Gulzar, Yongkang Zhu and Xiaofeng Han</i>
11:40	Journal First 	An Interleaving Approach to Combinatorial Testing and Failure-Inducing Interaction Identification <i>Xintao Niu, Changhai Nie, Hareton Leung, Yu Lei, Xiaoyin Wang, Jiayi Xu and Yan Wang</i>
11:50	Journal First 	An Empirical Comparison of Combinatorial Testing, Random Testing and Adaptive Random Testing <i>Huayao Wu, Changhai Nie, Justyna Petke, Yue Jia and Mark Harman</i>
12:00	NIER 	Assurances in Software Testing: A Roadmap <i>Marcel Böhme</i>
12:10	Journal First 	Automatic Test Improvement with DSpot: A Study with Ten Mature Open-Source Projects <i>Benjamin Danglot, Oscar Luis Vera Pérez, Benoit Baudry and Martin Monperrus</i>
12:20		Discussion






Controlled Experiments of Production Software (Notre-Dame) – Yvonne Dittrich

Time	Track	Presentation
11:00	SEIP 	Three Key Checklists and Remedies for Trustworthy Analysis of Online Controlled Experiments at Scale <i>Aleksander Fabijan, Pavel Dmitriev, Helena Holmström Olsson, Jan Bosch, Lukas Vermeer and Dylan Lewis</i>
11:20	SEIP 	Safe Velocity: A Practical Guide to Software Deployment at Scale Using Controlled Rollout <i>Tong Xia, Sumit Bhardwaj, Pavel Dmitriev and Aleksander Fabijan</i>
11:40	SEIP 	Experimentation in the Operating System: The Windows Experimentation Platform <i>Paul Luo Li, Pavel Dmitriev, Huibin Mary Hu, Xiaoyu Chai, Zoran Dimov, Brandon Paddock, Ying Li, Alex Kirshenbaum, Irina Niculescu and Taj Thoresen</i>
12:00	SEIP 	Automating Chaos Experiments in Production <i>Ali Basiri, Lorin Hochstein, Nora Jones and Haley Tucker</i>
12:20		Discussion

Automated Program Repair 1 (Laurier) – Lars Grunske

Time	Track	Presentation
11:00	Technical	Learning to Spot and Refactor Inconsistent Method Names <i>Kui Liu, Dongsun Kim, Tegawendé F. Bissyandé, Taeyoung Kim, Kisub Kim, Anil Koyuncu, Suntae Kim and Yves Le Traon</i>
11:20	Technical	Harnessing Evolution for Multi-Hunk Program Repair <i>Seemanta Saha, Ripon Saha and Mukul Prasad</i>
11:40	Technical	On Learning Meaningful Code Changes via Neural Machine Translation <i>Michele Tufano, Jevgenija Pantiuchina, Cody Watson, Gabriele Bavota and Denys Poshyvanyk</i>
12:00	Journal First	Mining Fix Patterns for FindBugs Violations <i>Kui Liu, Dongsun Kim, Tegawendé F. Bissyandé, Shin Yoo and Yves Le Traon</i>
12:10	Journal First	Test-equivalence Analysis for Automatic Patch Generation <i>Sergey Mechtaev, Xiang Gao, Shin Hwei Tan and Abhik Roychoudhury</i>
12:20		Discussion

Static Analysis (Viger) – Laura Dillon

Time	Track	Presentation
11:00	Technical  	SMOKE: Scalable Path-Sensitive Memory Leak Detection for Millions of Lines of Code <i>Gang Fan, Rongxin Wu, Qingkai Shi, Xiao Xiao, Jinguo Zhou and Charles Zhang</i>
11:20	Technical  	Reasonably-Most-General Clients for JavaScript Library Analysis <i>Erik Krogh Kristensen and Anders Møller</i>
11:40	Technical 	Resource-aware Program Analysis via Online Abstraction Coarsening <i>Kihong Heo, Hakjoo Oh and Hongseok Yang</i>
12:00	Demo	SMT-Based Refutation of Spurious Bug Reports in the Clang Static Analyzer <i>Mikhail R. Gadelha, Enrico Steffnlongo, Lucas C. Cordeiro, Bernd Fischer and Denis A. Nicole</i>
12:20		Discussion

Lunch (12:30 – 14:00)

Networking Event (Agora)

12:30 – 14:00 Student/Industry Networking Lunch
 Jinqiu Yang (Concordia University)

Note: All student registrants to the main ICSE program are invited to this networking event. This lunch provides students with an opportunity to interact with multiple industrial participants from the conference sponsors.







Hands-On Tutorial (Centre-Ville)

13:30 – 15:30 R for Software Engineering Research
Greg Wilson (RStudio)






SEIS: Gender and Trust (Van-Horne) – Kelly Blincoe

Time	Track	Presentation
14:00	SEIS	Implicit Gender Biases in Professional Software Development: An Empirical Study <i>Yi Wang and David Redmiles</i>
14:20	SEIS	Gender Diversity and Women in Software Teams: How Do They Affect Community Smells? <i>Gemma Catolino, Fabio Palomba, Damian A. Tamburri, Alexander Serebrenik and Filomena Ferrucci</i>
14:40	SEIS	Trust Beyond Computation Alone: Human Aspects of Trust in Blockchain Technologies <i>Barney Craggs and Awaiz Rashid</i>
15:00	Posters	Reinforcing Diversity Company Policies: Insights From StackOverflow Developers Survey <i>Karina Kohl Silveira, Rafael Prikladnicki, Soraia Musse, Isabel Manssour and Renata Vieira</i>
15:05	Posters	When Software Development Meets the Shopfloor: The Case of Industrial Fablabs <i>Tudor B. Ionescu</i>
15:10	Posters	A Decentralized Application for Fostering Biodiversity: Opportunities and Challenges <i>Jagadeesh Chandra Bose R. P., Vikrant Kaulgud, Mauro Rebelo and Sanjay Podder</i>
15:15		Discussion

Test Generation (Place du Canada) – Adam Porter

Time	Track	Presentation
14:00	SEIP 	Concolic Testing for High Test Coverage with Reduced Human Effort in the Automotive Industry <i>Yunho Kim, Dongju Lee, Junki Baek and Moonzoo Kim</i>
14:20	Demo 	AsFault: Testing Self-Driving Car Software Using Search-based Procedural Content Generation <i>Alessio Gambi, Marc Mueller and Gordon Fraser</i>
14:40	Demo 	AC3R: Automatically Reconstructing Car Crashes from Police Reports <i>Tri Huynh, Alessio Gambi and Gordon Fraser</i>
15:00	Technical   	Automatically Generating Precise Oracles from Structured Natural Language Specifications <i>Manish Motwani and Yuriy Brun</i>
15:20		Discussion

Debugging and Fault Localization (Laurier) – Marsha Chechik








Time	Track	Presentation
14:00	Technical 	A System Identification Based Oracle for Control-CPS Software Fault Localization <i>Zhijian He, Yao Chen, Enyan Huang, Qixin Wang, Yu Pei and Haidong Yuan</i>
14:20	Demo	VeDebug: Regression Debugging Tool for Java <i>Ben Buhse, Thomas Wei, Zhiqiang Zang, Aleksandar Milicevic and Milos Gligoric</i>
14:40	Technical   	ReCDroid: Automatically Reproducing Android Application Crashes from Bug Reports <i>Yu Zhao, Tingting Yu, Ting Su, Yang Liu, Wei Zheng, Jingzhi Zhang and William G.J. Halfond</i>
15:00	Journal First 	How Practitioners Perceive Automated Bug Report Management Techniques <i>Wei Qin Zou, David Lo, Zhenyu Chen, Xin Xia, Yang Feng and Baowen Xu</i>
15:10	Journal First	Chaff from the Wheat: Characterizing and Determining Valid Bug Reports <i>Yuanrui Fan, Xin Xia, David Lo and Ahmed E. Hassan</i>
15:20		Discussion

DevOps and Logging (Sherbrooke) – Diomidis Spinellis





Time	Track	Presentation
14:00	SEIP 	An Empirical Investigation of Incident Triage for Online Service Systems <i>Junjie Chen, Xiaoting He, Qingwei Lin, Yong Xu, Hongyu Zhang, Dan Hao, Feng Gao, Zhangwei Xu, Yingnong Dang and Dongmei Zhang</i>
14:20	SEIP 	Tools and Benchmarks for Automated Log Parsing <i>Jieming Zhu, Shilin He, Jinyang Liu, Pinjia He, Qi Xie, Zibin Zheng and Michael Lyu</i>
14:40	Technical 	Mining Historical Test Logs to Predict Bugs and Localize Faults in the Test Logs <i>Anunay Amar and Peter Rigby</i>
15:00	Technical 	DLFinder: Characterizing and Detecting Duplicate Logging Code Smells <i>Zhenhao Li, Tse-Hsun (Peter) Chen, Jinqiu Yang and Weiyi (Ian) Shang</i>
15:20		Discussion

Continue...

Security 2 (Duluth) – Arie van Deursen

Time	Track	Presentation
14:00	Technical   	The Seven Sins: Security Smells in Infrastructure as Code Scripts <i>Akond Rahman, Chris Parnin and Laurie Williams</i>
14:20	Technical  	DiffFuzz: Differential Fuzzing for Side-Channel Analysis <i>Shirin Nilizadeh, Yannic Noller and Corina S. Pasareanu</i>
14:40	NIER 	Detecting Suspicious Package Updates <i>Kalil Garrett, Gabriel Ferreira, Limin Jia, Joshua Sunshine and Christian Kästner</i>
14:50	Demo	EASYFLOW: Keep Ethereum Away From Overflow <i>Jianbo Gao, Han Liu, Chao Liu, Qingshan Li, Zhi Guan and Zhong Chen</i>
15:10	Journal First 	Automatic Feature Learning for Predicting Vulnerable Software Components <i>Hoa Khanh Dam, Truyen Tran, Trang Pham, Shien Wee Ng, John Grundy and Aditya Ghose</i>
15:20		Discussion





Continuous Integration (Viger) – Ipek Ozkaya

Time	Track	Presentation
14:00	SEIP 	Big Bangs and Small Pops: On Critical Cyclomatic Complexity and Developer Integration Behavior <i>Daniel Ståhl, Antonio Martini and Torvald Mårtensson</i>
14:20	SEIP 	Predictive Test Selection <i>Mateusz Machalica, Alex Samylkin, Meredith Porth and Satish Chandra</i>
14:40	SEIP 	Assessing Transition-based Test Selection Algorithms at Google <i>Claire Leong, Abhayendra Singh, Mike Papadakis, Yves Le Traon and John Micco</i>
15:00	Technical  	Automated Reporting of Anti-Patterns and Decay in Continuous Integration <i>Carmine Vassallo, Sebastian Proksch, Harald Gall and Massimiliano Di Penta</i>
15:20		Discussion

SEET: Multi-disciplinary Teaching in SE (Notre-Dame) – Cécile Péraire

Time	Track	Presentation
14:00	SEET	Dual-Track Agile in Software Engineering Education <i>Cécile Péraire</i>
14:15	Posters	Good-Bye Localhost: A Cloud-Based Web IDE for Teaching Java EE Web Development to Non-Computer Science Majors <i>Michael Leisner and Philipp Brune</i>
14:21	SEET	Teaching Internet of Things (IoT) Literacy: A Systems Engineering Approach <i>Natalia Silvis-Cividjian</i>
14:36	SEET	Teaching User Centered Conceptual Design Using Cross-Cultural Personas and Peer Reviews for a Large Cohort of Students <i>Farshid Anvari, Deborah Richards, Michael Hitchens and Hien Minh Thi Tran</i>
14:51	Posters	Directives of Communicability: Teaching Students How to Improve Communication Through Software Modeling <i>Adriana Lopes, Edson Oliveira, Tayana Conte and Clarisse Sieckenius de Souza</i>
14:57		Discussion

IoT and Cooperative Systems (Sainte-Catherine) – Marcelo d'Amorim

Time	Track	Presentation
14:00	SEIP 	OpenPnP: A Plug-and-Produce Architecture for the Industrial Internet of Things <i>Heiko Koziolk, Andreas Burger, Marie Platenius-Mohr, Julius Rückert and Gösta Stomberg</i>
14:20	SEIP 	Making Configurable and Unified Platform, Ready for Broader Future Devices <i>MyungJoo Ham and Geunsik Lim</i>
14:40	Demo 	IoT Composer: Composition and Deployment of IoT Applications <i>Ajay Krishna, Michel Le Pallec, Radu Mateescu, Ludovic Noirie and Gwen Salařn</i>
15:00	NIER 	(Do Not) Trust in Ecosystems <i>Emilia Cioroica, Thomas Kuhn and Barbora Buhnova</i>
15:20		Discussion

Coffee Break (15:30 – 16:00)

Hands-On Tutorial (Centre-Ville)

15:45 – 17:30 R for Software Engineering Research
Greg Wilson (RStudio)




SE Datasets, Research Infrastructure, and Methodology (Viger) – Rashina Hoda

Time	Track	Presentation
16:00	Technical	BugSwarm: Mining and Continuously Growing a Dataset of Reproducible Failures and Fixes <i>Naji Dmeiri, David A. Tomassi, Yichen Wang, Antara Bhowmick, Yen-Chuan Liu, Premkumar T. Devanbu, Bogdan Vasilescu and Cindy Rubio-Gonzalez</i>
16:20	Demo	DefeXts: A Curated Dataset of Reproducible Real-World Bugs for Modern JVM Languages <i>Samuel Benton, Ali Ghanbari and Lingming Zhang</i>
16:40	NIER	Open Collaborative Data – Using OSS Principles to Share Data in SW Engineering <i>Per Runeson</i>
16:50	NIER	Leveraging Small Software Engineering Data Sets with Pre-trained Neural Networks <i>Andrea A. Janes and Romain Robbes</i>
17:00	Technical	ActionNet: Vision-based Workflow Action Recognition From Programming Screencasts <i>Dehai Zhao, Zhenchang Xing, Chunyang Chen, Xin Xia and Guoqiang Li</i>
17:20	Journal First	The ABC of Software Engineering Research <i>Klaas-Jan Stol and Brian Fitzgerald</i>
17:30	NIER	Mining Plausible Hypotheses from the Literature via Meta-Analysis <i>Jooyoung Yi, Vladimir Ivanov and Giancarlo Succi</i>
17:40	Journal First	Analyzing Families of Experiments in SE: A Systematic Mapping Study <i>Adrian Santos, Omar Gomez and Natalia Juristo</i>
17:50		Discussion

Agile Development (Notre-Dame) – Rafael Prikladnicki





Time	Track	Presentation
16:00	SEIP 	Coping Strategies for Temporal, Geographical and Sociocultural Distances in Agile GSD: A Case Study <i>Dávid Marcell Szabó and Jan-Philipp Steghöfer</i>
16:20	Technical  	The Product Backlog <i>Todd Sedano, Cécile Péraire and Paul Ralph</i>
16:40	SEIP 	A Longitudinal Study of Identifying and Paying Down Architectural Debt <i>Maleknaz Nayebe, Yuanfang Cai, Rick Kazman, Guenther Ruhe, Qiong Feng, Chris Carlson and Francis Chew</i>
17:00	SEIP 	Agile Exponential Software Organizations (SEIP Interactive Session) <i>Yael Dubinsky and Orit Hazzan</i>

Model-Based Software Engineering (Van-Horne) – Johann Schumann








Time	Track	Presentation
16:00	SEIP 	Strategies and Best Practices for Model-based Systems Engineering Adoption in Embedded Systems Industry <i>Tiago Amorim, Andreas Vogelsang, Florian Pudlitz, Peter Gersing and Jan Philipps</i>
16:20	Demo 	VIATRA Solver: A Framework for the Automated Generation of Consistent Domain-Specific Models <i>Oszkár Semeráth, Aren Babikian, Sebastian Pilarski and Daniel Varro</i>
16:40	Technical	Practical GUI Testing of Android Applications via Model Abstraction and Refinement <i>Tianxiao Gu, Chengnian Sun, Xiaoxing Ma, Chun Cao, Chang Xu, Yao-Yuan Yang, Qirun Zhang, Jian Lu and Zhendong Su</i>
17:00	Technical  	AutoTap: Synthesizing and Repairing Trigger-Action Programs Using LTL Properties <i>Lefan Zhang, Weijia He, Jesse Martinez, Noah Brackenburg, Shan Lu and Blase Ur</i>
17:20	NIER	Towards a Cognizant Virtual Software Modeling Assistant Using Model Clones <i>Matthew Stephan</i>
17:30	Journal First	A Model-Integrated Approach to Designing Self-Protecting Systems <i>Stefano Iannucci, Sherif Abdelwahed, Andrea Montemaggio, Melissa Hannis, Leslie Leonard, Jason King and Drew Hamilton</i>
17:40	Journal First	Symbolic Refinement of Extended State Machines with Applications to the Automatic Derivation of Sub-Components and Controllers <i>Khaled El-Fakih and Gregor Bochmann</i>
17:50		Discussion

Continue...

Mobile Apps (Sherbrooke) – Sandeep Kuttal

Time	Track	Presentation
16:00	SEIP 	Large-scale Empirical Study on Industrial Fake Apps <i>Chongbin Tang, Sen Chen, Lingling Fan, Lihua Xu, Yang Liu, Zhushou Tang and Liang Dou</i>
16:20	SEIP 	Practical Android Test Recording with Espresso Test Recorder <i>Stas Negara, Naeem Esfahani and Raymond Buse</i>
16:40	Technical	Mimic: UI Compatibility Testing System for Android Apps <i>Taeyeon Ki, Chang Min Park, Karthik Dantu, Steve Ko and Lukasz Ziarek</i>
17:00	Technical	IconIntent: Automatic Identification of Sensitive UI Widgets based on Icon Classification for Android Apps <i>Xusheng Xiao, Xiaoyin Wang, Zhihao Cao, Hanlin Wang and Peng Gao</i>
17:20	Journal First 	Studying Bad Updates of Top Free-to-Download Apps in the Google Play Store <i>Safwat Hassan, Cor-Paul Bezemer and Ahmed E. Hassan</i>
17:30	NIER 	Navigation-aware and Personalized Prefetching of Network Requests in Android Apps <i>Ivano Malavolta, Francesco Nocera, Patricia Lago and Marina Mongiello</i>
17:40		Discussion









Test Selection and Prioritization (Duluth) – Robert Feldt

Time	Track	Presentation
16:00	SEIP 	Improving Test Effectiveness Using Test Executions History: An Industrial Experience Report <i>Armin Najafi, Weiyi (Ian) Shang and Peter Rigby</i>
16:20	Technical 	FastLane: Test Minimization for Rapidly Deployed Large-scale Online Services <i>Adithya Abraham Philip, Ranjita Bhagwan, Rahul Kumar, Chandra Sekhar Maddila and Nachiappan Nagappan</i>
16:40	Technical   	Scalable Approaches for Test Suite Reduction <i>Emilio Cruciani, Breno Miranda, Roberto Verdecchia and Antonia Bertolino</i>
17:00	SEIP 	Using Machine Learning to Recommend Correctness Checks for Geographic Map Data <i>Abhaya Parthy, Leopold Silberstein, Emily Kowalczyk, John Paul High, Adithya Nagarajan and Atif Memon</i>
17:20	Technical 	A Framework for Checking Regression Test Selection Tools <i>Chenguang Zhu, Owolabi Legunsen, August Shi and Milos Gligoric</i>
17:40	Journal First	ConTesa: Directed Test Suite Augmentation for Concurrent Software <i>Tingting Yu, Zunchen Huang and Chao Wang</i>
17:50		Discussion

Analysis and Verification (Laurier) – Domenico Bianculli

Time	Track	Presentation
16:00	Technical 	Easy Modelling and Verification of Unpredictable and Preemptive Interrupt-driven Systems <i>Minxue Pan, Shouyu Chen, Yu Pei, Tian Zhang and Xuandong Li</i>
16:20	Technical	Towards Understanding and Reasoning about Android Interoperations <i>Sora Bae, Sungho Lee and Sukyoung Ryu</i>
16:40	Demo	ALPACA: A Large Portfolio-based Alternating Conditional Analysis <i>Mitchell Gerrard and Matthew Dwyer</i>
17:00	Demo	Mockingbird: A Framework for Enabling Targeted Dynamic Analysis of Java Programs <i>Derrick Lockwood, Benjamin Holland and Suraj Kothari</i>
17:20	Technical 	Zero-Overhead Path Prediction with Progressive Symbolic Execution <i>Richard Rutledge, Sunjae Park, Haider Khan, Alessandro Orso, Milos Prvulovic and Alenka Zajic</i>
17:40	Journal First	Platform-Independent Dynamic Taint Analysis for JavaScript <i>Rezwana Karim, Frank Tip, Alena Sochurkova and Koushik Sen</i>
17:50		Discussion

Program Comprehension and Reuse (Sainte-Catherine) – Baishakhi Ray

Time	Track	Presentation
16:00	Technical  	Active Inductive Logic Programming for Code Search <i>Aishwarya Sivaraman, Tianyi Zhang, Guy Van den Broeck and Miryung Kim</i>
16:20	Journal First	The State of Empirical Evaluation in Static Feature Location <i>Abdul Razzaq, Asanka Wasala, Chris Exton and Jim Buckley</i>
16:30	Journal First	Automatic and Accurate Expansion of Abbreviations in Parameters <i>Yanjie Jiang, Hui Liu, Jiaqi Zhu and Lu Zhang</i>
16:40	Technical  	NL2Type: Inferring JavaScript Function Types from Natural Language Information <i>Rabee Sohail Malik, Jibesh Patra and Michael Pradel</i>
17:00	Technical   	Analyzing and Supporting Adaptation of Online Code Examples <i>Tianyi Zhang, Di Yang, Cristina Lopes and Miryung Kim</i>
17:20	Technical 	DockerizeMe: Automatic Inference of Environment Dependencies <i>Eric Horton and Chris Parnin</i>
17:40		Discussion

Continue...

Studying Developers (Place du Canada) – Thomas Fritz

Time	Track	Presentation
16:00	Technical 	How C++ Developers Use Immutability Declarations: An Empirical Study <i>Jon Eyolfson and Patrick Lam</i>
16:20	Journal First 	Need for Sleep: The Impact of a Night of Sleep Deprivation on Novice Developers' Performance <i>Davide Fucci, Giuseppe Scanniello, Simone Romano and Natalia Juristo</i>
16:30	Technical	Latent Patterns in Activities: A Field Study of How Developers Manage Context <i>Souti Chattopadhyay, Nicholas Nelson, Yenifer Ramirez Gonzalez, Annel Amelia Leon, Rahul Pandita and Anita Sarma</i>
16:50	Technical 	Developer Reading Behavior while Summarizing Java Methods: Size and Context Matters <i>Nahla Abid, Bonita Sharif, Natalia Dragan, Hend Alrasheed and Jonathan Maletic</i>
17:10	Technical 	Distilling Neural Representations of Data Structure Manipulation using fMRI and fNIRS <i>Yu Huang, Xinyu Liu, Ryan Krueger, Tyler Santander, Xiaosu Hu, Kevin Leach and Westley Weimer</i>
17:30	NIER	Biofeedback Augmented Software Engineering: Monitoring of Programmers' Mental Effort <i>Ricardo Couceiro, Gonçalo Duarte, João Durães, João Castelhana, Catarina Duarte, Cesar Teixeira, Miguel Castelo Branco, Paulo Carvalho and Henrique Madeira</i>
17:40		Discussion

ACM SIGSOFT/IEEE TCSE Town Hall Meeting (Centre-Ville)

Reception (Foyer)

Awards (Place du Canada) – Lionel Briand and Domenico Bianculli


- ACM SIGSOFT Distinguished Paper Awards
Tevfik Bultan and Jon Whittle
- 8:40-9:00 IEEE Software Best Software Engineering in Practice Paper Award
Helen Sharp and Michael Whalen

Keynote (Place du Canada) – Jon Whittle

- 9:00-10:30 Publish or Perish: Questioning the Impact of Our Research on the Software Developer
Margaret-Anne Storey (Professor, University of Victoria)

Coffee Break (10:30 – 11:00)



Technical Briefing (Viger) – Sebastian Uchitel

- 11:00-12:30 AIOps: Real-World Challenges and Research Innovations
 *Yingnong Dang (Principal Data Scientist Manager, Microsoft Azure), Qingwei Lin (Lead Researcher, Microsoft Research Asia) and Ryan (Peng) Huang (Assistant Professor, John Hopkins University)*

ACM Student Research Competition (Sherbrooke) – Julia Rubin and Alessandro Garcia

- 11:00-12:30 Selected Presentations

Software Analytics (Place du Canada) – Christian Bird

Time	Track	Presentation
11:00	SEIP 	Take Control: (On the Unreasonable Effectiveness of Software Analytics) (<i>SEIP Talk</i>) <i>Tim Menzies</i>
11:30	Technical 	Analysis and Detection of Information Types of Open Source Software Issue Discussions <i>Deeksha Arya, Cheryl Wang, Jin L.C. Guo and Jinghui Cheng</i>
11:50	Journal First	Automating Intention Mining <i>Qiao Huang, Xin Xia, David Lo and Gail Murphy</i>
12:00	Journal First	Leveraging Historical Associations between Requirements and Source Code to Identify Impacted Classes <i>Davide Falessi, Justin Roll, Jin L.C. Guo and Jane Cleland-Huang</i>
12:10	NIER	Towards Predicting the Impact of Software Changes on Building Activities <i>Michele Tufano, Hitesh Sajnani and Kim Herzig</i>
12:20		Discussion

Continue...







Tool Taxonomy and Adoption (Duluth) – Bogdan Vasilescu

Time	Track	Presentation
11:00	Technical  	Do Developers Discover New Tools On The Toilet?, <i>Emerson Murphy-Hill, Edward Smith, Caitlin Sadowski, Ciera Japan, Collin Winter, Matthew Jorde, Andrea Knight, Andrew Trenk and Steve Gross</i>
11:20	Technical	Tool Choice Matters: JavaScript Quality Assurance Tools and Usage Outcomes in GitHub Projects <i>David Kavalier, Asher Trockman, Bogdan Vasilescu and Vladimir Filkov</i>
11:40	Journal First	Automatically Categorizing Software Technologies <i>Mathieu Nassif, Christoph Treude and Martin Robillard</i>
11:50	Demo	Witt: Querying Technology Terms Based on Automated Classification <i>Mathieu Nassif, Christoph Treude and Martin Robillard</i>
12:10		Discussion




SEET: SE Instructional Strategies (Sainte-Catherine) – Tim Lethbridge

Time	Track	Presentation
11:00	SEET	The Case of the Fragmented Classroom <i>William Billingsley</i>
11:15	Posters	Quantifying Patterns and Programming Strategies in Block-based Programming Environments <i>Max Kesselbacher and Andreas Bollin</i>
11:21	SEET	Linking Code Readability, Structure, and Comprehension among Novices: It's Complicated <i>Eliane Wiese, Anna Rafferty and Armando Fox</i>
11:36	SEET	FVT: A Fragmented Video Tutor for “Dubbing” Software Development Tutorials <i>Chunyin Nong, Qiao Zhang, Liguang Huang, Di Cui, Qinghua Zheng and Ting Liu</i>
11:46	SEET	Mistakes in UML Diagrams: Analysis of Student Projects in a Software Engineering Course <i>Stanislav Chren, Barbora Buhnova, Martin Macak, Lukas Daubner and Bruno Rossi</i>
12:01		Discussion

Process and Project Management (Centre-Ville) – Eray Tüzün


Time	Track	Presentation
11:00	SEIP 	Catching up with Method and Process Practice: An Industry-Informed Baseline for Researchers <i>Jil Klünder, Regina Hebig, Paolo Tell, Marco Kuhrmann, Joyce Nakatumba-Nabende, Rogardt Heldal, Stephan Krusche, Masud Fazal-Baqaie, Michael Felderer, Marcela Fabiana Genero Bocco, Steffen Küpper, Sherlock A. Licorish, Gustavo López, Fergal McCaffery, Özden Özcan Top, Christian R. Prause, Rafael Prikladnicki, Eray Tüzün, Dietmar Pfahl, Kurt Schneider and Stephen G. MacDonell</i>
11:20	Demo 	SortingHat: Wizardry on Software Project Members <i>David Moreno, Santiago Dueñas, Valerio Cosentino, Miguel Angel Fernandez, Ahmed Zerouali, Gregorio Robles and Jesus M. Gonzalez-Barahona</i>
11:40	Journal First 	Usage and Attribution of Stack Overflow Code Snippets in GitHub Projects <i>Sebastian Baltes and Stephan Diehl</i>
11:50	Journal First 	Linear Programming as a Baseline for Software Effort Estimation <i>Federica Sarro and Alessio Petrozziello</i>
12:00	Journal First 	Asymmetric Release Planning Compromising Satisfaction against Dissatisfaction <i>Maleknaz Nayebe and Guenther Ruhe</i>
12:10	NIER 	Towards Effective AI-Powered Agile Project Management <i>Hoa Khanh Dam, Truyen Tran, John Grundy, Aditya Ghose and Yasutaka Kamei</i>
12:20		Discussion

Continuous Delivery (Notre-Dame) – Robert Chatley

Time	Track	Presentation
11:00	SEIP 	Factors Affecting Cloud Infra-Service Development Lead Times: A Case Study at ING <i>Hennie Huijgens, Eric Greuter, Jerry Brons, Evert A. van Doorn, Ioannis Papadopoulos, Francisco Morales Martinez, Maurício Aniche, Otto Visser and Arie van Deursen</i>
11:20	SEIP 	DevDocOps: Towards Automated Documentation for DevOps <i>Guoping Rong, Zefeng Jin, He Zhang, Youwen Zhang, Wenhua Ye and Dong Shao</i>
11:40	SEIP 	Transition towards Continuous Delivery in the Healthcare Domain (SEIP Talk) <i>Fabio Giorgi and Frances Paulisch</i>
12:10		Discussion

Continue...

Unit Testing (Laurier) – Martin Kropp

Time	Track	Presentation
11:00	SEIP 	Mythical Unit Test Coverage (<i>SEIP Talk</i>) <i>Vard Antinyan and Miroslaw Staron</i>
11:30	Technical	Hunting for Bugs in Code Coverage Tools via Randomized Differential Testing <i>Yibiao Yang, Yuming Zhou, Hao Sun, Zhendong Su, Zhiqiang Zuo, Lei Xu and Baowen Xu</i>
11:50	Technical	Rotten Green Tests <i>Julien Delplanque, Stéphane Ducasse, Guillermo Polito, Andrew P. Black and Anne Etien</i>
12:10	Journal First	A Comprehensive Study of Pseudo-tested Methods <i>Oscar Luis Vera Pérez, Benjamin Danglot, Martin Monperrus and Benoit Baudry</i>
12:20		Discussion

Requirements (Van-Horne) – Liliana Pasquale

Time	Track	Presentation
11:00	Demo	MCP: A Security Testing Tool Driven by Requirements <i>Xuan Phu Mai, Fabrizio Pastore, Arda Goknil and Lionel Briand</i>
11:20	Demo	M2PT: A Tool for Automated Prototype Generation from Requirements Model <i>Yilong Yang, Xiaoshan Li, Zhiming Liu and Wei Ke</i>
11:40	Technical	Supporting Analysts by Dynamic Extraction and Classification of Requirements-Related Knowledge <i>Zahra Shakeri Hossein Abad, Vincenzo Gervasi, Didar Zowghi and Behrouz Far</i>
12:00	Journal First	An Active Learning Approach for Improving the Accuracy of Automated Domain Model Extraction <i>Chetan Arora, Mehrdad Sabetzadeh, Shiva Nejati and Lionel Briand</i>
12:10	NIER	Requirements Engineering as Science in the Small <i>Munindar P. Singh and Amit Chopra</i>
12:20		Discussion

Lunch (12:30 – 14:00)

ROSE Festival (Agora) – Tim Menzies

Recognizing and rewarding Open science in Software Engineering, the ROSE festival is a worldwide salute to replication and reproducibility in SE. This is the venue where researchers can receive public credit for facilitating and participating in open science in SE.

Enter ROSE! This is a 90-minute session comprising lightning talks by researchers presenting replicated and reproduced results, followed by a panel discussing issues of replication in software engineering.

Presentations (12:30-14:00)

Lightning Talks

A Partial Reproduction of Malware Detection with RevealDroid
Xiaoqin Fu and Haipeng Cai

A Partial Replication of “Sentiment Analysis for Software Engineering: How Far Can We Go?”
Gias Uddin, Foutse Khomh, Yann-Gael Guehenuec and Chanchal K Roy

A Partial Replication of “Decoding the Representation of Code in the Brain: An fMRI Study of Code Review and Expertise”
Davide Fucci, Daniela Girardi, Nicole Novielli, Luigi Quaranta and Filippo Lanubile

The Impact of Code Review Measures on Post-Release Defects: Replications and Bayesian Networks
Andrey Krutauz, Tapajit Dey, Peter Rigby and Audris Mockus

An Eye Tracking Replication on How Developers Read and Summarize Java Methods
Nahla Abid, Bonita Sharif and Jonathan Maletic

An Investigation of Routine Repetitiveness in Open-Source Projects: A Partial Reproduction of “A Large-scale Study on Repetitiveness, Containment, and Composability of Routines in Open Source Projects”
Mohd Arafat and Robert Dyer

Partial Replication of Seven Studies on Comparing the Stability of Clone and Non-clone Code
Manishankar Mondal, Md Saidur Rahman, Chanchal K. Roy and Kevin Schneider

A Partial Replication of “Automatic Summarization of Bug Reports”
Akalanka Galappaththi and John Anvik

Improving Source Code Readability: Theory and Practice
Devjeet Roy, Sarah Fakhoury and Venera Arnaoudova


Position Paper

Mobile-App Analysis and Instrumentation Techniques Reimagined with DECREE
Yixue Zhao and Nenad Medvidović

Goldfish Bowl Panel

Ensuring the Success of Open Science: Practicalities, Tools, and Checklists

Technical Briefing (Viger) – Sebastian Uchitel

14:00 – 15:30  Software Engineering for Automated Vehicles: Addressing the Needs of Cars that Run on Software and Data
Krzysztof Czarnecki (Professor, University of Waterloo)

Hands-On Tutorial (Centre-Ville)

14:00 – 17:30 Presentation 101
Michele Lanza (Università della Svizzera Italiana)



Crowdsourced Knowledge and Feedback (Sainte-Catherine) – Xin Xia

Time	Track	Presentation
14:00	SEIP 	Emerging App Issue Identification from User Feedback: Experience on WeChat <i>Cuiyun Gao, Wujie Zheng, Yuetang Deng, David Lo, Jichuan Zeng, Michael Lyu and Irwin King</i>
14:20	Journal First 	An Empirical Study of Game Reviews on the Steam Platform <i>Dayi Lin, Cor-Paul Bezemer, Ying Zou and Ahmed E. Hassan</i>
14:30	Technical	How Reliable is the Crowdsourced Knowledge of Security Implementation? <i>Mengsu Chen, Felix Fischer, Na Meng, Xiaoyin Wang and Jens Grossklags</i>
14:50	Technical	Pattern-based Mining of Opinions in Q&A Websites <i>Bin Lin, Fiorella Zampetti, Gabriele Bavota, Massimiliano Di Penta and Michele Lanza</i>
15:10	Journal First 	How Do Users Revise Answers on Technical Q&A Websites? A Case Study on Stack Overflow <i>Shaowei Wang, Tse-Hsun Peter Chen and Ahmed E. Hassan</i>
15:20		Discussion



Requirements Engineering for Mass-Market Software (Van-Horne) – Paul Ralph

Time	Track	Presentation
14:00	SEIP 	Data-Driven Requirements Engineering (SEIP Talk) <i>Walid Maalej, Maleknaz Nayebi and Guenther Ruhe</i>
14:30	Demo 	Guigle: A GUI Search Engine for Android Apps <i>Carlos Bernal-Cárdenas, Kevin Moran, Michele Tufano, Zichang Liu, Linyong Nan, Zhehan Shi and Denys Poshyvanyk</i>
14:50	Technical 	StoryDroid: Automated Generation of Storyboard for Android Apps <i>Sen Chen, Lingling Fan, Chunyang Chen, Ting Su, Wenhe Li, Yang Liu and Lihua Xu</i>
15:10	Journal First	Metamorphic Relations for Enhancing System Understanding and Use <i>Zhi Quan (George) Zhou, Liqun Sun, Tsong Yueh Chen and Dave Towey</i>
15:20		Discussion

Trends and Challenges in SE (Place du Canada) – Barbora Buhnova

Time	Track	Presentation
14:00	SEIP 	Software Engineering for Machine Learning: A Case Study <i>Saleema Amershi, Andrew Begel, Christian Bird, Robert DeLine, Harald Gall, Ece Kamar, Nachiappan Nagappan, Besmira Nushi and Thomas Zimmermann</i>
14:20	NIER	Blockchain-based Software Engineering <i>Moritz Beller and Joseph Hejderup</i>
14:30	NIER	On Testing Quantum Programs <i>Andriy Miranskyy and Lei Zhang</i>
14:40	NIER	Towards a Systematic Study of Values in SE: Tools for Industry and Education <i>Emily Winter, Stephen Forshaw, Lucy Hunt and Maria Angela Ferarrio</i>
14:50	NIER	Robustness and Games Against Nature in Molecular Programming <i>Jack H. Lutz, Neil Lutz, Robyn R. Lutz and Matthew Riley</i>
15:00	Technical 	Statistical Algorithmic Profiling for Randomized Approximate Programs <i>Keyur Joshi, Vimuth Fernando and Sasa Misailovic</i>
15:20		Discussion

Automated Repair 2 (Laurier) – Hamid Bagheri

Time	Track	Presentation
14:00	SEIP 	SapFix: Automated End-to-End Repair at Scale <i>Alexandru Marginean, Johannes Bader, Satish Chandra, Mark Harman, Yue Jia, Ke Mao, Alexander Mols and Andrew Scott</i>
14:20	Technical 	VFix: Value-Flow-Guided Precise Program Repair for Null Pointer Dereferences <i>Xuezheng Xu, Yulei Sui, Hua Yan and Jingling Xue</i>
14:40	Journal First	ARJA: Automated Repair of Java Programs via Multi-Objective Genetic Programming <i>Yuan Yuan and Wolfgang Banzhaf</i>
14:50	Technical	On Reliability of Patch Correctness Assessment <i>Xuan Bach D. Le, Lingfeng Bao, David Lo, Xin Xia, Shanping Li and Corina S. Pasareanu</i>
15:10	Journal First	Alleviating Patch Overfitting with Automatic Test Generation: A Study of Feasibility and Effectiveness for the Nopol Repair System <i>Zhongxing Yu, Matias Martinez, Benjamin Danglot, Thomas Durieux and Martin Monperrus</i>
15:20		Discussion

Continue...

SEET: Assessment in the Classroom (Notre-Dame) – Ivana Bosnić

Time	Track	Presentation
14:00	SEET	MAF: Method-Anchored Test Fragmentation for Test Code Plagiarism Detection <i>Weisong Sun, Xingya Wang, Haoran Wu, Ding Duan, Zesong Sun and Zhenyu Chen</i>
14:15	Poster	A Grading Schema for Reinforcing Teamwork Quality in a Capstone Course <i>Maíra Cecilia Bastarrica, Daniel Perovich, Francisco J. Gutierrez and Maíra Marques</i>
14:21	SEET	Simulating Student Mistakes to Evaluate the Fairness of Automated Grading <i>Benjamin Clegg, Siobhán North, Phil McMinn and Gordon Fraser</i>
14:31	SEET	Automatic Grading of Programming Assignments: A Formal Semantics Based Approach <i>Xiao Liu, Shuai Wang, Pei Wang and Dinghao Wu</i>
14:46	SEET	Experience Report on a Move to Techniques-oriented Student Project Grading <i>Siim Karus</i>
14:56		Discussion

Dependencies (Duluth) – Danny Weyns

Time	Track	Presentation
14:00	Demo	ENRE: A Tool Framework for Extensible eNtity Relation Extraction <i>Wuxia Jin, Yuanfang Cai, Rick Kazman, Qinghua Zheng, Di Cui and Ting Liu</i>
14:20	Technical 	Detection and Repair of Architectural Inconsistencies in Java <i>Negar Ghorbani, Joshua Garcia and Sam Malek</i>
14:40	Technical	Can I Have a Stack Trace to Examine the Dependency Conflict Issue? <i>Ying Wang, Ming Wen, Rongxin Wu, Zhenwei Liu, Shin Hwei Tan, Zhiliang Zhu, Hai Yu and Shing-Chi Cheung</i>
15:00	Technical	Investigating the Impact of Multiple Dependency Structures on Software Defects <i>Di Cui, Ting Liu, Yuanfang Cai, Qinghua Zheng, Qiong Feng, Wuxia Jin, Jiaqi Guo and Yu Qu</i>
15:20		Discussion

SEIS: Software as a Social Construct (Sherbrooke) – Damian Andrew Tamburri

Time	Track	Presentation
14:00	SEIS	An Anatomy of Security Conversations in Stack Overflow <i>Tamara Lopez, Thein Tun, Arosha Bandara, Mark Levine, Bashar Nuseibeh and Helen Sharp</i>
14:20	SEIS	Software Engineering in Civic Tech: A Case Study about Code for Ireland <i>Antti Knutas, Victoria Palacin, Giovanni Maccani and Markus Helfert</i>
14:40	SEIS	Beyond the Code Itself: How Programmers Really Look at Pull Requests <i>Denae Ford, Mahnaz Behroozi, Alexander Serebrenik and Chris Parnin</i>
15:00	SEIS	Architecture Design Decision Maps for Software Sustainability <i>Patricia Lago</i>
15:10		Discussion

Coffee Break (15:30 – 16:00)

Plenary Session (Place du Canada)

Awards

16:00-16:10	Recap of ACM SIGSOFT and IEEE TCSE Awards <i>Lionel Briand, Domenico Bianculli</i>
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Most Influential Paper ICSE 2009 – Paola Inverardi and Joanne Atlee

16:10-17:00	It Does What You Say, Not What You Mean: Lessons From A Decade of Program Repair <i>Westley Weimer (U. Michigan), ThanhVu Nguyen (U. Nebraska, Lincoln), Claire Le Goues (Carneige Mellon U.) and Stephanie Forrest (Arizona State U.)</i>
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Harlan Mills / ACM SIGSOFT Outstanding Research Award – Lionel Briand

17:00-18:00	The Joys and Frustrations of Software Engineering <i>Mark Harman (Facebook)</i>
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Banquet (1909 Taverne Moderne)

Awards (Place du Canada) – Lionel Briand and Domenico Bianculli

- 8:40 – 9:00 ICSE Papers Awards (NIER, SEET, Doctoral Symposium)
Anita Sarma, Leonardo Murta, Daniela Damian, Sarah Beecham, Laurie Williams, Silvia Abrahão
- ICSE Distinguished Reviewer Awards
Tevfik Bultan, Jon Whittle

Keynote (Place du Canada) – Tevfik Bultan




- 9:00 – 10:30 Building Reproducible, Reusable, and Robust Machine Learning Software
Joelle Pineau (Professor, McGill University)

Coffee Break (10:30 – 11:00)


Technical Briefing (Sherbrooke) – Jim Whitehead

- 11:00 – 12:30  Developing Games that Capture and Engage Users
Magy Seif El-Nasr (Associate Professor, Northeastern University)


Defect Prediction (Laurier) – Burak Turhan

Time	Track	Presentation
11:00	Journal First	Perceptions, Expectations, and Challenges in Defect Prediction <i>Zhiyuan Wan, Xin Xia, Ahmed E. Hassan, David Lo, Jianwei Yin and Xiaohu Yang</i>
11:10	  Technical	Mining Software Defects: Should We Consider Affected Release? <i>Suraj Yatish, Jirayus Jiarpakdee, Patanamon Thongtanunam and Chakkrit Tantithamthavorn</i>
11:30	Technical	Class Imbalance Evolution and Verification Latency in Just-in-Time Software Defect Prediction <i>George Cabral, Leandro Minku, Emad Shihab and Suhaib Mujahid</i>
11:50	Journal First	The Impact of Class Rebalancing Techniques on the Performance and Interpretation of Defect Prediction Models <i>Chakkrit Tantithamthavorn, Ahmed E. Hassan and Kenichi Matsumoto</i>
12:00	Journal First	On the Relative Value of Data Resampling Approaches for Software Defect Prediction <i>Kwabena Ebo Bennin, Jacky Wai Keung and Akito Monden</i>
12:10	 NIER	Energy-Based Anomaly Detection A New Perspective for Predicting Software Failures <i>Cristina Monni and Mauro Pezzè</i>
12:20		Discussion

SEET: Empirical Studies of SE Education (Sainte-Catherine) – Sira Vegas


Time	Track	Presentation
11:00	SEET 	Training Software Engineers Using Open-Source Software: The Students' Perspective <i>Gustavo Pinto, Clarice Moraes Ferreira, Cleice Souza, Igor Steinmacher and Paulo Meirelles</i>
11:15	Posters	An Empirical Study on Female Participation in Software Project Courses <i>Anh Nguyen Duc, Letizia Jaccheri and Pekka Abrahamsson</i>
11:21	SEET	Attitudes, Beliefs, and Development Data Concerning Agile Software Development Practices <i>Christoph Matthies, Johannes Huegle, Tobias Dürschmid and Ralf Teusner</i>
11:36	Posters	Comparing the Popularity of Testing Careers among Canadian, Chinese, and Indian Students <i>Luiz Fernando Capretz, Pradeep Waychal and Jingdong Jia</i>
11:42	SEET	A Survey on Online Learning Preferences for Computer Science and Programming <i>Javier Escobar-Avila, Deborah Venuti, Massimiliano Di Penta and Sonia Haiduc</i>
11:52	Posters	Software Engineering Studies Attractiveness for the Highly Educated Women Planning to Change Career in Finland <i>Sonja Hyrnsalmi and Sami Hyrnsalmi</i>
11:58		Discussion

Mining Software Changes and Patterns (Centre-Ville) – Ayse Bener

Time	Track	Presentation
11:00	Technical 	The List is the Process: Reliable Pre-Integration Tracking of Commits on Mailing Lists <i>Ralf Ramsauer, Daniel Lohmann and Wolfgang Maurer</i>
11:20	Technical	Graph-based Mining of In-the-Wild, Fine-grained, Semantic Code Change Patterns <i>Hoan Nguyen, Tien Nguyen, Danny Dig, Son Nguyen, Hieu Tran and Michael Hilton</i>
11:40	Demo	Coming: A Tool for Mining Change Pattern Instances from Git Commits <i>Matias Martinez and Martin Monperrus</i>
12:00	Demo	PatchNet: A Tool for Deep Patch Classification <i>Thong Hoang, Julia Lawall, Richard J Oentaryo, Yuan Tian and David Lo</i>
12:20		Discussion

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Machine Learning in Static Analysis (Place du Canada) – Na Meng

Time	Track	Presentation
11:00	Technical	Training Binary Classifiers as Data Structure Invariants <i>Facundo Molina, Renzo Degiovanni, Pablo Ponzio, Germán Regis, Nazareno Aguirre and Marcelo F. Frias</i>
11:20	Technical	Graph Embedding based Familial Analysis of Android Malware Using Unsupervised Learning <i>Ming Fan, Xiapu Luo, Jun Liu, Meng Wang, Chunyin Nong, Qinghua Zheng and Ting Liu</i>
11:40	Technical 	A Novel Neural Source Code Representation Based on Abstract Syntax Tree <i>Jian Zhang, Xu Wang, Hongyu Zhang, Hailong Sun, Kaixuan Wang and Xudong Liu</i>
12:00	Technical	A Neural Model for Generating Natural Language Summaries of Program Subroutines <i>Alexander LeClair, Siyuan Jiang and Collin McMillan</i>
12:20		Discussion






Fuzzing (Duluth) – Marcel Böhme

Time	Track	Presentation
11:00	Technical 	SLF: Fuzzing without Valid Seed Inputs <i>Wei You, Xuwei Liu, Shiqing Ma, David Mitchel Perry, Xiangyu Zhang and Bin Liang</i>
11:20	Technical	Superion: Grammar-Aware Greybox Fuzzing <i>Junjie Wang, Bihuan Chen, Lei Wei and Yang Liu</i>
11:40	Technical  	Grey-box Concolic Testing on Binary Code <i>Jaeseung Choi, Joonun Jang, Choongwoo Han and Sang Kil Cha</i>
12:00	Technical 	REST-ler: Stateful REST API Fuzzing <i>Vaggelis Atlidakis, Patrice Godefroid and Marina Polishchuk</i>
12:20		Discussion





Software Product Lines (Van-Horne) – Shahar Maoz

Time	Track	Presentation
11:00	Technical 	Intention-Based Integration of Software Variants <i>Max Lillack, Ștefan Stănculescu, Wilhelm Hedman, Thorsten Berger and Andrzej Wąsowski</i>
11:20	Technical  	Supporting the Statistical Analysis of Variability Models <i>Ruben Heradio, David Fernandez-Amoros, Christoph Mayr-Dorn and Alexander Egyed</i>
11:40	Demo	xLineMapper: A Product Line Feature-Architecture-Implementation Mapping Toolset <i>Cuong Cu, Xin Ye and Yongjie Zheng</i>
12:00	Technical	Multifaceted Automated Analyses for Variability-Intensive Embedded Systems <i>Sami Lazreg, Maxime Cordy, Philippe Collet, Patrick Heymans and Sébastien Mosser</i>
12:20		Discussion

Concurrency (Notre-Dame) – Tuba Yavuz

Time	Track	Presentation
11:00	Technical  	Safe Automated Refactoring for Intelligent Parallelization of Java 8 Streams <i>Raffi Khatchadourian, Yiming Tang, Mehdi Bagherzadeh and Syed Ahmed</i>
11:20	Technical 	Detecting Atomicity Violations for Event-Driven Node.js Applications <i>Xiaoning Chang, Wensheng Dou, Yu Gao, Jie Wang, Jun Wei and Tao Huang</i>
11:40	Technical  	Parallel Refinement for Multi-Threaded Program Verification <i>Liangze Yin, Wei Dong, Wanwei Liu and Ji Wang</i>
12:00	Demo	SWORD: A Scalable Whole Program Race Detector for Java <i>Yanze Li, Bozhen Liu and Jeff Huang</i>
12:20		Discussion

Developer Biases and Trust (Viger) – Kelly Blincoe

Time	Track	Presentation
11:00	Technical 	FLOSS Participants' Perceptions about Gender and Inclusiveness: A Survey <i>Amanda Lee and Jeffrey Carver</i>
11:20	Technical  	Going Farther Together: The Impact of Social Capital on Sustained Participation in Open Source <i>Huilian Sophie Qiu, Alexander Nolte, Anita Brown, Alexander Serebrenik and Bogdan Vasilescu</i>
11:40	Technical 	Investigating the Effects of Gender Bias on GitHub <i>Nasif Imtiaz, Justin Middleton, Joymallya Chakraborty, Neill Robson, Gina Bai and Emerson Murphy-Hill</i>
12:00	Journal First	Cognitive Biases in Software Engineering: A Systematic Mapping Study <i>Rahul Mohanani, Iflaah Salman, Burak Turhan, Pilar Rodriguez and Paul Ralph</i>
12:20		Discussion

Lunch (12:30 – 14:00)

SEIS Keynote (Laurier) – Rick Kazman and Liliana Pasquale

14:00 – 15:30 Terraforming Earth: Will Software Experiments Guide Us Out of the Climate Crisis?
Steve Easterbrook (Professor, University of Toronto)

Testing of AI Systems (Place du Canada) – Marija Mikić

Time	Track	Presentation
14:00	Technical	CRADLE: Cross-Backend Validation to Detect and Localize Bugs in Deep Learning Libraries <i>Hung Viet Pham, Thibaud Lutellier, Weizhen Qi and Lin Tan</i>
14:20	Technical	Guiding Deep Learning System Testing Using Surprise Adequacy <i>Jinhan Kim, Robert Feldt and Shin Yoo</i>
14:40	Demo	DeepConcolic: Testing and Debugging Deep Neural Networks <i>Youcheng Sun, Xiaowei Huang, Daniel Kroening, James Sharp, Matthew Hill and Rob Ashmore</i>
15:00	NIER	Towards Improved Testing For Deep Learning <i>Jasmine Sekhon and Cody Fleming</i>
15:10	NIER	Structural Coverage Criteria for Neural Networks Could Be Misleading <i>Zenan Li, Xiaoxing Ma, Chang Xu and Chun Cao</i>
15:20	NIER	Robustness of Neural Networks: A Probabilistic and Practical Perspective <i>Ravi Mangal, Aditya Nori and Alessandro Orso</i>


Human Factors (Centre-Ville) – Christoph Treude

Time	Track	Presentation
14:00	Technical	How Practitioners Perceive Coding Proficiency <i>Xin Xia, Zhiyuan Wan, Pavneet Singh Kochhar and David Lo</i>
14:20	Technical	Socio-Technical Work-Rate Increase Associates With Changes in Work Patterns in Online Projects <i>Farhana Sarker, Bogdan Vasilescu, Kelly Blincoe and Vladimir Filkov</i>
14:40	Technical	Why Do Episodic Volunteers Stay in FLOSS Communities? <i>Ann Barcomb, Klaas-Jan Stol, Dirk Riehle and Brian Fitzgerald</i>
15:00	Journal First	Uncovering the Periphery: A Qualitative Survey of Episodic Volunteering in Free/Libre and Open Source Software Communities <i>Ann Barcomb, Andreas Kaufmann, Dirk Riehle, Klaas-Jan Stol and Brian Fitzgerald</i>
15:10	Journal First	Discovering Community Patterns in Open-Source: A Systematic Approach and Its Evaluation <i>Damian Andrew Tamburri, Fabio Palomba, Alexander Serebrenik and Andy Zaidman</i>
15:20		Discussion

SEET: Novel Approaches in SE Education (Notre-Dame) – Hakan Erdogmus

Time	Track	Presentation
14:00	SEET	Teaching Software Construction at Scale with Mastery Learning: A Case Study <i>Elisa Baniassad, Alice Campbell, Tiara Allidina and Asrai Ord</i>
14:20	Posters	Fostering Design Patterns Education: An Exemplar Inspired in the Angry Birds Game <i>Diogo Silva, Marcelo Schots and Leticia Duboc</i>
14:21	SEET	Having Fun in Learning Formal Specifications <i>Wishnu Prasetya, Craig Leek, Orestis Melkonian, Joris ten Tusscher, Jan van Bergen, Jasper Everink, Thomas van der Klis, Rick Meijerink, Roan Oosenbrug, Jelle Oostveen, Tijmen van den Pol and Wink van Zon</i>
14:31	Posters	A Data-driven Security Game to Facilitate Information Security Education <i>Dag Erik Homdrum Løvgren, Jingyue Li and Tosin Daniel Oyetoyan</i>
14:37	SEET	Look What I Can Do: Acquisition of Programming Skills in the Context of Living Labs <i>Mazyar Seraj, Cornelia S. Große, Serge Autexier and Rolf Drechsler</i>
14:52	SEET	How Much 'Authenticity' can be Achieved in Software Engineering Project Based Courses? <i>Zahra Shakeri Hossein Abad, Muneera Bano and Didar Zowghi</i>
15:07		Discussion

API Analysis (Duluth) – Sam Malek


Time	Track	Presentation
14:00	Technical	Exposing Library API Misuses via Mutation Analysis <i>Ming Wen, Yepang Liu, Rongxin Wu, Xuan Xie, Shing-Chi Cheung and Zhendong Su</i>
14:20	Demo	Vetting API Usages in C Programs with IMChecker <i>Zuxing Gu, Jiecheng Wu, Li Chi, Min Zhou, Yu Jiang, Ming Gu and Jiaquang Sun</i>
14:40	Technical 	PIVOT: Learning API-Device Correlations to Facilitate Android Compatibility Issue Detection <i>Lili Wei, Yepang Liu and Shing-Chi Cheung</i>
15:00	Technical	SafeCheck: Safety Enhancement of Java Unsafe API <i>Shiyou Huang, Jianmei Guo, Sanhong Li, Xiang Li, Yumin Qi, Kingsum Chow and Jeff Huang</i>
15:20		Discussion

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Performance (Saint-Catherine) – Michael Pradel

Time	Track	Presentation
14:00	Technical  	Redundant Loads: A Software Inefficiency Indicator <i>Pengfei Su, Shasha Wen, Hailong Yang, Milind Chabbi and Xu Li</i>
14:20	Technical   	View-Centric Performance Optimization for Database-Backed Web Applications <i>Junwen Yang, Cong Yan, Chengcheng Wan, Shan Lu and Alvin Cheung</i>
14:40	Technical	AdJust: Runtime Mitigation of Resource Abusing Third-Party Online Ads <i>Weihang Wang, I Luk Kim and Yunhui Zheng</i>
15:00	NIER	PLUS: Performance Learning for Uncertainty of Software <i>Catia Trubiani and Sven Apel</i>
15:10	NIER	Simulator-Based Diff-Time Performance Testing <i>Ivan Postolski, Victor Braberman, Diego Garbervettsky and Sebastian Uchitel</i>
15:20		Discussion


Specifications and Models (Van-Horne) – Sylvain Hallé

Time	Track	Presentation
14:00	Demo	PsALM: Specification of Dependable Robotic Missions <i>Claudio Menghi, Christos Tsigkanos, Thorsten Berger and Patrizio Pelliccione</i>
14:20	Technical 	Symbolic Repairs for GR(1) Specifications <i>Shahar Maoz, Jan Oliver Ringert and Rafi Shalom</i>
14:40	Demo	AREpair: A Repair Framework for Alloy <i>Kaiyuan Wang, Allison Sullivan and Sarfraz Khurshid</i>
15:00	Demo	Visual Debugging of Behavioural Models <i>Gianluca Barbon, Vincent Leroy, Gwen Salařn and Emmanuel Yah</i>
15:20		Discussion

Crowdsourcing in Software Engineering (Viger) – Tayana Conte





Time	Track	Presentation
14:00	SEIP 	Crowdsourcing in Software Engineering: Models, Motivations, and Challenges (SEIP Talk) <i>Thomas LaToza</i>
14:30	Technical 	CTRAS: Crowdsourced Test Report Aggregation and Summarization <i>Rui Hao, Yang Feng, James Jones, Yuying Li and Zhenyu Chen</i>
14:50	Technical  	iSENSE: Completion-Aware Crowdttesting Management <i>Junjie Wang, Ye Yang, Rahul Krishna, Tim Menzies and Qing Wang</i>
15:20		Discussion

IDEs (Sherbrooke) – Sarah Nadi

Time	Track	Presentation
14:00	Technical	When Code Completion Fails: A Case Study on Real-World Completions <i>Vincent Hellendoorn, Sebastian Proksch, Harald C. Gall and Alberto Bacchelli</i>
14:20	Technical	Interactive Production Performance Feedback in the IDE <i>Jürgen Cito, Philipp Leitner, Martin Rinard and Harald Gall</i>
14:40	Demo	Git-based Integrated Uncertainty Manager <i>Naoyasu Ubayashi, Takuya Watanabe, Yasutaka Kamei and Ryosuke Sato</i>
15:00	NIER 	Beyond Integrated Development Environments: Adding Context to Software Development <i>Gail Murphy</i>
15:10		Discussion




Coffee Break (15:30 – 16:00)

Configuration and Optimization (Sherbrooke) – Caroline Lemieux



Time	Track	Presentation
16:00	Technical 	Distance-Based Sampling of Software Configuration Spaces <i>Christian Kaltenecker, Alexander Grebhahn, Norbert Siegmund, Jianmei Guo and Sven Apel</i>
16:20	Technical 	DeepPerf: Performance Prediction for Configurable Software with Deep Sparse Neural Network <i>Huong Ha and Hongyu Zhang</i>
16:40	Journal First 	Software Configuration Engineering in Practice - Interviews, Survey, and Systematic Literature Review <i>Mohammed Sayagh, Nouredine Kerzazii, Bram Adams and Fabio Petrillo</i>
16:50	Journal First 	Finding Faster Configurations using FLASH <i>Vivek Nair, Zhe Yu, Tim Menzies, Norbert Siegmund and Sven Apel</i>
17:00	Journal First	FEMOSAA: Feature-Guided and Knee-Driven Multi-Objective Optimization for Self-Adaptive Software <i>Tao Chen, Ke Li, Rami Bahsoon and Xin Yao</i>
17:10		Discussion

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Software Documentation (Centre-Ville) – Bonita Sharif

Time	Track	Presentation
16:00	SEIP 	Web Feature Deprecation: A Case Study for Chrome <i>Ariana Mirian, Nikunj Bhagat, Caitlin Sadowski, Adrienne Porter Felt, Stefan Savage and Geoffrey M. Voelker</i>
16:20	Technical 	Software Documentation Issues Unveiled <i>Emad Aghajani, Csaba Nagy, Olga Lucero Vega-Márquez, Mario Linares Vásquez, Laura Moreno, Gabriele Bavota and Michele Lanza</i>
16:40	Technical 	9.6 Million Links in Source Code Comments: Purpose, Evolution, and Decay <i>Hideaki Hata, Christoph Treude, Raula Gaikovina Kula and Takashi Ishio</i>
17:00	Journal First	Categorizing the Content of GitHub README Files <i>Gede Artha Azriadi Prana, Christoph Treude, Ferdian Thung, Thushari Atapattu and David Lo</i>
17:10		Discussion


Reverse Engineering (Sainte-Catherine) – Sandeep Kuttal

Time	Track	Presentation
16:00	Technical	Recovering Variable Names for Minified Code with Usage Contexts <i>Hieu Tran, Ngoc Tran, Son Nguyen, Hoan Nguyen and Tien Nguyen</i>
16:20	Technical 	Gigahorse: Thorough, Declarative Decompilation of Smart Contracts <i>Neville Grech, Lexi Brent, Bernhard Scholz and Yannis Smaragdakis</i>
16:40	Technical 	Probabilistic Disassembly <i>Kenneth Miller, Yonghui Kwon, Yi Sun, Zhuo Zhang, Xiangyu Zhang and Zhiqiang Lin</i>
17:00		Discussion


Code Reviews (Laurier) – Alexander Serebrenik

Time	Track	Presentation
16:00	Technical 	Test-Driven Code Review: An Empirical Study <i>Davide Spadini, Fabio Palomba, Tobias Baum, Stefan Hanenberg, Magiel Bruntink and Alberto Bacchelli</i>
16:20	Technical	Why Does Code Review Work for Open Source Software Communities? <i>Adam Alami, Marisa Leavitt Cohn and Andrzej Wąsowski</i>
16:40	Journal First 	Does Reviewer Recommendation Help Developers? <i>Vladimir Kovalenko, Nava Tintarev, Evgeny Pasyunkov, Christian Bird and Alberto Bacchelli</i>
16:50	Journal First	The Impact of Human Factors on the Participation Decision of Reviewers in Modern Code Review <i>Shade Ruangwan, Patanamon Thongtanunam, Akinori Ihara and Kenichi Matsumoto</i>
17:00		Discussion

Energy Consumption in Mobile Apps (Notre-Dame) – Grace Lewis


Time	Track	Presentation
16:00	Technical	GreenBundle: An Empirical Study on the Energy Impact of Bundled Processing <i>Shaiful Chowdhury, Abram Hindle, Rick Kazman, Takumi Shuto, Ken Matsui and Yasutaka Kamei</i>
16:20	Technical 	Search-Based Energy Testing of Android <i>Reyhaneh Jabbarvand, Jun-Wei Lin and Sam Malek</i>
16:40	NIER	EMaaS: Energy Measurements as a Service for Mobile Applications <i>Luis Cruz and Rui Abreu</i>
16:50	Journal First	What Can Android Mobile App Developers Do About the Energy Consumption of Machine Learning? <i>Andrea McIntosh, Safwat Hassan and Abram Hindle</i>
17:00	Journal First	GreenScaler: Training Software Energy Models with Automatic Test Generation <i>Shaiful Chowdhury, Stephanie Borle, Stephen Romansky and Abram Hindle</i>
17:10		Discussion

Software Quality (Viger) – Alessandro Garcia

Time	Track	Presentation
16:00	SEIP 	WSQF: Comprehensive Software Quality Evaluation Framework and Benchmark Based on the SQuaRE <i>Naohiko Tsuda, Hironori Washizaki, Kiyoshi Honda, Hidenori Nakai, Yoshiaki Fukazawa, Motoei Azuma, Toshiro Komiyama, Tadashi Nakano, Hirotsugu Suzuki, Sumie Morita, Katsue Kojima and Akiyoshi Hando</i>
16:20	Technical 	Leveraging Artifact Trees to Evolve and Reuse Safety Cases <i>Ankit Agrawal, Seyedehzahra Khoshmanesh, Michael Vierhauser, Mona Rahimi, Jane Cleland-Huang and Robyn Lutz</i>
16:40	NIER	Trade-off-Oriented Development: Making Quality Attribute Trade-offs First-Class <i>Tobias Dürschmid, Eunsuk Kang and David Garlan</i>
16:50	NIER	Current Challenges in Practical Object-Oriented Software Design <i>Maurício Aniche, Joseph Yoder and Fabio Kon</i>
17:00		Discussion

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APIs (Duluth) – Chris Parnin

Time	Track	Presentation
16:00	Technical 	FOCUS: A Recommender System for Mining API Function Calls and Usage Patterns <i>Puong T. Nguyen, Juri Di Rocco, Davide Di Ruscio, Lina Ochoa, Thomas Degueule and Massimiliano Di Penta</i>
16:20	Demo	DRONE: A Tool to Detect and Repair Directive Defects in Java APIs Documentation <i>Yu Zhou, Xin Yan, Taolue Chen, Sebastiano Panichella and Harald Gall</i>
16:40	Demo	MULAPI: A Tool for API Method and Usage Location Recommendation <i>Congying Xu, Bosen Min, Xiaobing Sun, Jiajun Hu, Bin Li and Yucong Duan</i>
17:00	NIER	API Fluency <i>Romain Robbes, Mircea F. Lungu and Andrea A. Janes</i>
17:10		Discussion

Program Transformations (Van-Horne) – Cindy Rubio-Gonzalez

Time	Track	Presentation
16:00	Technical 	Global Optimization of Numerical Programs via Prioritized Stochastic Algebraic Transformations <i>Xie Wang, Huaijin Wang, Zhendong Su, Enyi Tang, Xin Chen, Weijun Shen, Zhenyu Chen, Linzhang Wang, Xianpei Zhang and Xuandong Li</i>
16:20	Technical 	Type Migration in Ultra-Large-Scale Codebases <i>Ameya Ketkar, Ali Mesbah, Davood Mazinanian, Danny Dig and Edward Aftandilian</i>
16:40	Technical	Dynamic Slicing for Android <i>Tanzirul Azim, Arash Alavi, Iulian Neamtui and Rajiv Gupta</i>
17:00	NIER	Conditional Compilation is Dead, Long Live Conditional Compilation! <i>Paul Gazzillo and Shiyi Wei</i>
17:10		Discussion

Testing and Analysis: Domain-Specific Approaches (Place du Canada) – Gregory Gay

Time	Track	Presentation
16:00	Technical 	Detecting Incorrect Build Rules <i>Nandor Licker and Andrew Rice</i>
16:20	Technical	Adversarial Sample Detection for Deep Neural Network through Model Mutation Testing <i>Jingyi Wang, Guoliang Dong, Jun Sun, Xinyu Wang and Peixin Zhang</i>
16:40	Journal First	Oracles for Testing Software Timeliness with Uncertainty <i>Chunhui Wang, Fabrizio Pastore and Lionel Briand</i>
16:50	Technical	Deep Differential Testing of JVM Implementations <i>Yuting Chen, Ting Su and Zhendong Su</i>
17:10		Discussion

Closing Ceremonies (Place du Canada)

- 17:30-18:00 ACM Student Research Competition Awards
 Julia Rubin and Alessandro Garcia
- ICSE 2019 Closing
 Laurie Williams
- Preview of ICSE 2021
 Natalia Juristo
- Preview of ICSE 2020
 (with performance by Charm Dance Company)
 Gregg Rothermel

Following the tradition of past years, ICSE 2019 will host the ACM Student Research Competition (SRC), sponsored by Microsoft Research. This competition offers undergraduate and graduate students a unique opportunity to experience the research world, present their research results, and compete for prizes.

To participate in the competition, each student submitted a 2-page description of his or her original research project. The authors of the selected project descriptions were invited to attend the SRC competition at ICSE and present their works: a poster presentation and a research talk. Selected posters will advance to the next stage of the competition with research talks on Thursday (May 30) at 11am.

Winners of the ICSE competition will be invited to participate in the ACM Student Research Competition Grand Finals.

Poster#	Poster Presentation (Sq. Dorchester)	Time
15A	Towards Zero Knowledge Learning for Cross Language API Mappings <i>Nghi D. Q. Bui</i>	14:00 & 16:00
15B	An Empirical Study On Leveraging Logs for Debugging Production Failures <i>An Ran Chen</i>	14:00 & 16:00
16A	MARVEL: A Generic, Scalable and Effective Vulnerability Detection Platform <i>Xiaoning Du</i>	14:00 & 16:00
16B	Visually Identifying Potential Sensitive Information Leaks in Access-Controlled Data Services <i>Kalvin Eng</i>	14:00 & 16:00
17A	Release Synchronization in Software Ecosystems <i>Armstrong Tita Foundjem</i>	14:00 & 16:00
17B	Guided, Automated Testing of Blockchain-based Decentralized Applications <i>Jianbo Gao</i>	16:00 only
18A	Android GUI Search Using Hand-drawn Sketches <i>Xiaofei Ge</i>	14:00 & 16:00

Poster#	Poster Presentation (Sq. Dorchester)	Time
18B	Finding Concurrency Exploits on Smart Contracts <i>Yue Li</i>	14:00 & 16:00
19A	Characterizing and Detecting Duplicate Logging Code Smells <i>Zhenhao Li</i>	16:00 only
19B	Agile Process Improvement in Retrospectives <i>Christoph Matthies</i>	14:00 & 16:00
20A	Towards Detection and Characterization of Variability Bugs in Configurable C Software: An Empirical Study <i>Austin Mordahl</i>	14:00 & 16:00
20B	Configuration-dependent Fault Localization <i>Son Nguyen</i>	14:00 & 16:00
21A	Improving Automated Program Repair with Retrospective Fault Localization <i>Tongtong Xu</i>	14:00 & 16:00
21B	Property Oriented Verification via Iterative Abstract Interpretation <i>Banghu Yin</i>	16:00 only
22A	A Systematic Evaluation of Problematic Tests Generated by Evosuite <i>Zhiyu Fan</i>	14:00 & 16:00
22B	JSOptimizer: An Extensible Framework for JavaScript Program Optimization <i>Yi Liu</i>	14:00 & 16:00
23A	Identifying Developers by their Application Usage <i>Ihar Shulhan</i>	14:00 & 16:00
23B	TOAD: A Tool for Recommending Auto-Refactoring Alternatives <i>Alejandra Siles</i>	14:00 only
24A	Impact of Lifestyle and Working Process Organization on the Job Satisfaction Level of Software Engineers <i>Aleksandr Tarasov</i>	14:00 & 16:00

The ICSE 2019 Poster Track provides a prime opportunity for researchers and practitioners to present, showcase, and discuss their most recent advances, ideas, and challenges in the field of software engineering.

Poster #	Presentation (Square Dorchester)
1A	A Winning Team - What Personality Has To Do With Software Engineering <i>Erica Weilemann</i>
1B	fAST: Flattening Abstract Syntax Trees for Efficiency <i>Yijun Yu</i>
2A	Recommending Unnecessary Source Code Based on Static Analysis <i>Roman Haas, Rainer Niedermayr, Tobias Roehm and Sven Apel</i>
2B	Towards Visualizing Large Scale Evolving Clones <i>Debajyoti Mondal, Manishankar Mondal, Chanchal K. Roy, Kevin Schneider, Shisong Wang and Yukun Li</i>
3A	Leveraging Contextual Information from Function Call Chains to Improve Fault Localization <i>Árpád Beszédes, Ferenc Horváth, Massimiliano Di Penta and Tibor Gyimóthy</i>
3B	Guiding Testing Effort Using Mutant Utility <i>Justin Alvin, Robert Kurtz, Paul Ammann, Huzefa Rangwala and René Just</i>
4A	Structural Test Coverage Criteria for Deep Neural Networks <i>Youcheng Sun, Xiaowei Huang, Daniel Kroening, James Sharp, Matthew Hill and Rob Ashmore</i>
4B	Wok: Statistical Program Slicing in Production <i>Bogdan-Alexandru Stoica, Swarup K. Sahoo, James R. Larus and Vikram S. Adve</i>
5A	Enhancing Precision of Structured Merge by Proper Tree Matching <i>Fengmin Zhu, Fei He and Qianshan Yu</i>
5B	Mimicking User Behavior to Improve In-House Test Suites <i>Qianqian Wang and Alessandro Orso</i>
6A	How Design Patterns Are Concerned by Developers? <i>He Jiang, Dong Liu, Xin Chen, Hui Liu and Hong Mei</i>
6B	Demand-Driven Refinement of Points-to Analysis <i>Chenguang Sun and Samuel Midkiff</i>
7A	Analyzing and Repairing Compilation Errors <i>Ali Mesbah, Andrew Rice, Edward Aftandilian, Emily Johnston and Nick Glorioso</i>

Poster#	Presentation (Square Dorchester)
7B	Localized or Architectural: An Empirical Study of Performance Issues Dichotomy <i>Yutong Zhao, Lu Xiao, Xiao Wang, Bihuan Chen and Yang Liu</i>
8A	Optimal MC/DC Test Case Generation <i>Joxan Jaffar, Sangharatna Godbole and Rasool Maghareh</i>
8B	Automatically Reconstructing Car Crashes from Police Reports for Testing Self-Driving Cars <i>Alessio Gambi, Tri Huynh and Gordon Fraser</i>
9A	Validity Fuzzing and Parametric Generators for Effective Random Testing <i>Rohan Padhye, Caroline Lemieux, Koushik Sen, Mike Papadakis and Yves Le Traon</i>
9B	Energy Distribution Matters in Greybox Fuzzing <i>Lingyun Situ, Linzhang Wang, Xuandong Li, Le Guan, Wenhui Zhang and Peng Liu</i>
10A	Optimizing Seed Inputs in Fuzzing with Machine Learning <i>Liang Cheng, Yang Zhang, Yi Zhang, Chen Wu, Zhangtan Li, Yu Fu and Haisheng Li</i>
10B	Carving Parameterized Unit Tests <i>Alexander Kampmann and Andreas Zeller</i>
11A	Dynamic Unit Test Extraction via Time Travel Debugging for Test Cost Reduction <i>Thomas Bach, Ralf Pannemans, Johannes Haeussler and Artur Andrzejak</i>
11B	Supervised Tie Breaking in Test Case Prioritization <i>Sepehr Eghbali, Vinit Kudva, Gregg Rothermel and Ladan Tahvildari</i>
12A	On the Deterioration of Learning-Based Malware Detectors for Android <i>Xiaoqin Fu and Haipeng Cai</i>
12B	Symbolic Execution for Attribution and Attack Synthesis in Neural Networks <i>Corina Pasareanu, Divya Gopinath, Sarfraz Khurshid, Kaiyuan Wang and Mengshi Zhang</i>
13A	Divide and Conquer: Recovering Contextual Information of Behaviors in Android Apps around Limited-quantity Audit Logs <i>Zhaoyi Meng, Yan Xiong, Wenchao Huang, Fuyou Miao, Taeho Jung and Jianmeng Huang</i>

Continue...

Poster#	Presentation (Square Dorchester)
13B	GUI-Guided Repair of Mobile Test Scripts <i>Minxue Pan, Tongtong Xu, Yu Pei, Zhong Li, Tian Zhang and Xuandong Li</i>
14A	FastDroid: Efficient Taint Analysis for Android Applications <i>Jie Zhang, Cong Tian and Zhenhua Duan</i>
14B	Deobfuscating Android Native Binary Code <i>Zeliang Kan, Haoyu Wang, Lei Wu, Yao Guo and Guoai Xu</i>
25A	An Empirical Study on Female Participation in Software Project Courses <i>Anh Nguyen, Letizia Jaccheri, Pekka Abrahamsson</i>
25B	Software Engineering Studies Attractiveness for the Highly Educated Women Planning to Change Career in Finland <i>Sonja Hyrynsalmi and Sami Hyrynsalmi</i>
26A	Incorporating Real Projects into a Software Engineering Undergraduate Curriculum <i>Rafael Chanin, Jorge Melegati, Afonso Sales, Mariana Detoni, Xiaofeng Wang and Rafael Prikladnicki</i>
26B	Industry Trends in Software Engineering Education: A Systematic Mapping Study <i>Orges Cico and Letizia Jaccheri</i>
27A	A Data-driven Security Game to Facilitate Information Security Education <i>Dag Erik Homdrum Løvgren, Jingyue Li and Tosin Daniel Oyetoyan</i>
27B	Comparing the Popularity of Testing Careers among Canadian, Chinese, and Indian Students <i>Luiz Fernando Capretz, Pradeep Waychal and Jingdong Jia</i>
28A	Directives of Communicability: Teaching Students How to Improve Communication Through Software Modeling <i>Adriana Lopes, Edson Oliveira, Tayana Conte and Clarisse Sieckenius de Souza</i>
28B	A Grading Schema for Reinforcing Teamwork Quality in a Capstone Course <i>María Cecilia Bastarrica, Daniel Perovich, Francisco J. Gutierrez and Máira Marques</i>
29A	Quantifying Patterns and Programming Strategies in Block-based Programming Environments <i>Max Kesselbacher and Andreas Bollin</i>

Poster#	Presentation (Square Dorchester)
29B	Good-Bye Localhost: A Cloud-Based Web IDE for Teaching Java EE Web Development to Non-Computer Science Majors <i>Michael Leisner and Philipp Brune</i>
30A	Studies on the Software Testing Profession <i>Luiz Fernando Capretz, Pradeep Waychal, Jingdong Jia, Daniel Varona and Yadira Lizama</i>
30B	Immutable Log Storage as a Service <i>William Pourmajidi, Lei Zhang, John Steinbacher, Tony Erwin and Andriy Miranskyi</i>
31A	A Decentralized Application for Fostering Biodiversity: Opportunities and Challenges <i>Jagadeesh Chandra Bose R P, Vikrant Kaulgud, Mauro Rebelo and Sanjay Podder</i>
31B	Beware of Disengaged User Acceptance in Testing Software-as-a-Service <i>Sebastian Loss, Raffaele Ciriello and Jürgen Cito</i>
32A	Exploring Customer Influence on the Agile Transformation of Service Providers <i>Jeppie Aagaard Glud, Kevin Helge Hansen-Schwartz and Raffaele Fabio Ciriello</i>
32B	Testing Untestable Neural Machine Translation: An Industrial Case <i>Wujie Zheng, Wenyu Wang, Dian Liu, Changrong Zhang, Qinsong Zeng, Yuetang Deng, Wei Yang, Pinjia He and Tao Xie</i>
33A	Evaluation of Feature Selection for Anomaly Detection in Automotive E/E Architectures, <i>Christoph Segler, Stefan Kugele, Philipp Obergfell, Mohd Hafeez Osman, Sina Shafaei, Eric Sax and Alois Knoll</i>
34A	Confidence in Programming Skills: Gender Insights from StackOverflow Developers Survey <i>Karina Kohl Silveira, Rafael Prikladnicki, Soraia Musse, Isabel Manssour and Renata Vieira</i>
34B	When Software Development Meets the Shopfloor: The Case of Industrial Fablabs <i>Tudor B. Ionescu</i>
35A	Constructural Software Documentation <i>Mathieu Nassif and Martin P. Robillard</i>
36A	Towards Crowd-Sourced API Documentation <i>Gias Uddin, Foutse Khomh and Chanchal K Roy</i>

The ICSE 2019 Demonstrations Track is a highly interactive venue in which researchers and practitioners can demonstrate their tools and discuss them with attendees. A tool demonstration provides the opportunity to communicate how the scientific approach has been implemented or how a specific hypothesis has been assessed.

Poster# Presentation (Square Dorchester)

1	ARepair: A Repair Framework for Alloy <i>Kaiyuan Wang, Allison Sullivan and Sarfraz Khurshid</i>
2	Visual Debugging of Behavioural Models <i>Gianluca Barbon, Vincent Leroy, Gwen Salaün and Emmanuel Yah</i>
3	DeepConcolic: Testing and Debugging Deep Neural Networks <i>Youcheng Sun, Xiaowei Huang, Daniel Kroening, James Sharp, Matthew Hill and Rob Ashmore</i>
4	PsALM: Specification of Dependable Robotic Missions <i>Claudio Menghi, Christos Tsigkanos, Thorsten Berger and Patrizio Pelliccione</i>
5	Git-based Integrated Uncertainty Manager <i>Naoyasu Ubayashi, Takuya Watanabe, Yasutaka Kamei and Ryosuke Sato</i>
8	Vetting API Usages in C Programs with IMChecker <i>Zuxing Gu, Jiecheng Wu, Li Chi, Min Zhou, Yu Jiang, Ming Gu and Jiaquan Sun</i>
9	xLineMapper: A Product Line Feature-Architecture-Implementation Mapping Toolset <i>Cuong Cu, Xin Ye and Yongjie Zheng</i>
10	DRONE: A Tool to Detect and Repair Directive Defects in Java APIs Documentation <i>Yu Zhou, Xin Yan, Taolue Chen, Sebastiano Panichella and Harald Gall</i>
11	MULAPI: A Tool for API Method and Usage Location Recommendation <i>Congying Xu, Bosen Min, Xiaobing Sun, Jiajun Hu, Bin Li and Yucong Duan</i>
12	PatchNet: A Tool for Deep Patch Classification <i>Thong Hoang, Julia Lawall, Richard J Oentaryo, Yuan Tian and David Lo</i>
13	Coming: a Tool for Mining Change Pattern Instances from Git Commits <i>Matias Martinez and Martin Monperrus</i>
16	SWORD: A Scalable Whole Program Race Detector for Java <i>Yanze Li, Bozhen Liu and Jeff Huang</i>
17	Guigle: A GUI Search Engine for Android Apps <i>Carlos Bernal-Cárdenas, Kevin Moran, Michele Tufano, Zichang Liu, Linyong Nan, Zhehan Shi and Denys Poshyvanyk</i>

Poster#	Presentation (Square Dorchester)
20	ENRE: A Tool Framework for Extensible eNtity Relation Extraction <i>Wuxia Jin, Yuanfang Cai, Rick Kazman, Qinghua Zheng, Di Cui and Ting Liu</i>
21	Witt: Querying Technology Terms based on Automated Classification <i>Mathieu Nassif, Christoph Treude and Martin P. Robillard</i>
22	RM2PT: A Tool for Automated Prototype Generation from Requirements Model <i>Yilong Yang, Xiaoshan Li, Zhiming Liu and Wei Ke</i>
23	MCP: A Security Testing Tool Driven by Requirements <i>Xuan Phu Mai, Fabrizio Pastore, Arda Goknil and Lionel Briand</i>
24	SortingHat: Wizardry on Software Project Members <i>David Moreno, Santiago Dueñas, Valerio Cosentino, Miguel Angel Fernandez, Ahmed Zerouali, Gregorio Robles and Jesus M. Gonzalez-Barahona</i>
25	SMT-Based Refutation of Spurious Bug Reports in the Clang Static Analyzer <i>Mikhail R. Gadelha, Enrico Steffnlongo, Lucas Cordeiro, Bernd Fischer and Denis Nicole</i>
26	VeDebug: Regression Debugging Tool for Java <i>Ben Buhse, Thomas Wei, Zhiqiang Zang, Aleksandar Milicevic and Milos Gligoric</i>
27	IoT Composer: Composition and Deployment of IoT Applications <i>Ajay Krishna, Michel Le Pallec, Radu Mateescu, Ludovic Noirie and Gwen Salaÿn</i>
28	EASYFLOW: Keep Ethereum Away From Overflow <i>Jianbo Gao, Han Liu, Chao Liu, Qingshan Li, Zhi Guan and Zhong Chen</i>
29	AsFault: Testing Self-Driving Car Software Using Search-based Procedural Content Generation <i>Alessio Gambi, Marc Mueller and Gordon Fraser</i>
30	AC3R: Automatically Reconstructing Car Crashes from Police Reports <i>Tri Huynh, Alessio Gambi and Gordon Fraser</i>
31	ALPACA: A Large Portfolio-based Alternating Conditional Analysis <i>Mitchell Gerrard and Matthew Dwyer</i>
32	Mockingbird: A Framework for Enabling Targeted Dynamic Analysis of Java Programs <i>Derrick Lockwood, Benjamin Holland and Suraj Kothari</i>
33	VIATRA Solver: A Framework for the Automated Generation of Consistent Domain-Specific Models <i>Oszkár Semeráth, Aren Babikian, Sebastian Pilarski and Daniel Varro</i>
34	eFeXts: A Curated Dataset of Reproducible Real-World Bugs for Modern JVM Languages <i>Samuel Benton, Ali Ghanbari and Lingming Zhang</i>

ACM SIGSOFT Distinguished Paper Awards

Detecting Incorrect Build Rules

Nandor Licker and Andrew Rice

Distilling Neural Representations of Data Structure Manipulation using fMRI and fNIRS

Yu Huang, Xinyu Liu, Ryan Krueger, Tyler Santander, Xiaosu Hu, Kevin Leach and Westley Weimer

Do Developers Discover New Tools On The Toilet?

Emerson Murphy-Hill, Edward Smith, Caitlin Sadowski, Ciera Jaspan, Collin Winter, Matthew Jorde, Andrea Knight, Andrew Trenk and Steve Gross

Going Farther Together: The Impact of Social Capital on Sustained Participation in Open Source

Huilian Sophie Qiu, Alexander Nolte, Anita Brown, Alexander Serebrenik and Bogdan Vasilescu

iSENSE: Completion-Aware Crowdfunding Management

Junjie Wang, Ye Yang, Rahul Krishna, Tim Menzies and Qing Wang

Redundant Loads: A Software Inefficiency Indicator

Pengfei Su, Shasha Wen, Hailong Yang, Milind Chabbi and Xu Liu

Resource-aware Program Analysis via Online Abstraction Coarsening

Kihong Heo, Hakjoo Oh and Hongseok Yang

Scalable Approaches for Test Suite Reduction

Emilio Cruciani, Breno Miranda, Roberto Verdecchia and Antonia Bertolino

SMOKE: Scalable Path-Sensitive Memory Leak Detection for Millions of Lines of Code

Gang Fan, Rongxin Wu, Qingkai Shi, Xiao Xiao, Jinguo Zhou and Charles Zhang

The Seven Sins: Security Smells in Infrastructure as Code Scripts

Akond Rahman, Chris Parnin and Laurie Williams

View-Centric Performance Optimization for Database-Backed Web Applications

Junwen Yang, Cong Yan, Chengcheng Wan, Shan Lu and Alvin Cheung

ICSE 2019 Distinguished Reviewers

Domenico Bianculli

University of Luxembourg

Christian Bird

Microsoft Research

Yvonne Dietrich

IT University of Copenhagen

Antonio Filieri

Imperial College London

Milos Gligoric

University of Texas at Austin

Grace Lewis

Carnegie Mellon SEI

Liliana Pasquale

University College Dublin & Lero

Paul Ralph

University of Auckland

ICSE-10 Most Influential Paper Award

Automatically Finding Patches Using Genetic Programming

Westley Weimer, ThanhVu Nguyen, Claire Le Goues and Stephanie Forrest

IEEE Software Best Software Engineering in Practice Distinguished Paper Award

Software Engineering for Machine Learning: A Case Study

Saleema Amershi, Andrew Begel, Christian Bird, Robert DeLine, Harald Gall, Ece Kamar, Nachiappan Nagappan, Besmira Nushi and Thomas Zimmermann

New Ideas and Emerging Results Distinguished Paper Awards

Beyond Integrated Development Environments: Adding Context to Software Development

Gail Murphy

Energy-Based Anomaly Detection A New Perspective for Predicting Software Failures

Cristina Monni and Mauro Pezzè

Software Engineering Education and Training Distinguished Paper Award

Training Software Engineers using Open-Source Software: The Students' Perspective

Gustavo Pinto, Clarice Moraes Ferreira, Cleice Souza, Igor Steinmacher and Paulo Meirelles

Doctoral Symposium Distinguished Paper Award

**Automated Fine-Grained Requirements-to-Code Traceability
Link Recovery**

Juan Manuel Florez

ACM Student Research Competition Winners Undergraduate Category

To be decided during the conference

ACM Student Research Competition Winners Graduate Category

To be decided during the conference

IEEE Awards

Harlan D. Mills Award

Mark Harman

Facebook and University College London

IEEE CS TCSE Distinguished Women in Science and Engineering (WISE) Leadership Award

Barbara Kitchenham

Keele University

IEEE CS TCSE Synergy Award

Software Center (SC)

Chalmers University of Technology

IEEE TCSE Distinguished Educator Award

Bernd Brügge

Technical University of Munich (TUM)

ACM Awards

ACM SIGSOFT Outstanding Research Award

Mark Harman

Facebook and University College London

ACM SIGSOFT Influential Educator Award

Ahmed E. Hassan

Queen's University

ACM SIGSOFT Distinguished Service Award

Matt Dwyer

University of Virginia

ACM SIGSOFT Early Career Researcher Award

Jeff Huang

Texas A&M University

ACM SIGSOFT Outstanding Doctoral Dissertation Award

Sergey Mechtaev

University College London

Honorable Mention:

Christoffer Quist Adamsen, Google Inc.

ACM SIGSOFT Frank Anger Memorial Award

Jacob Krüger

Otto-von-Guericke-University

ACM SIGSOFT Impact Paper Award

CUTE: A Concolic Unit Testing Engine for C

Koushik Sen, Darko Marinov, Gul Agha, ESEC/SIGSOFT FSE 2005

SIGSOFT ACM Fellows - 2018

Gul Agha

University of Illinois at Urbana-Champaign

John Hughes

Chalmers University

Prem Devanbu

University of California, Davis

SIGSOFT ACM Distinguished Members - 2018

Sven Apel

University of Passau

Marsha Chechik

University of Toronto

Rajesh Balan

Singapore Management University

SIGSOFT ACM Senior Members - 2018

Samuel A. Ajjila

Carleton University

Kester Quist-Aphetsi

Ghana Technology University

Jim Lawson

University of California, Berkeley

Santanu K. Rath

National Institute of Technology Rourkela

Community Meetings

Sun May 26	Tue May 28	Wed May 29	Thu May 30	Fri May 31
MSR SC Notre-Dame 12:30-14:00	JSS EB Dièse 12:30-17:15	ESEC/FSE SC Copier 12:30-14:00	ICSE'21 OC Copier 7:30-8:45	TSE EB Dièse 12:30-14:00
SEAMS SC Sherbrooke 12:30-14:00	ICSE SC Dièse 18:30-23:00	ISSTA SC Coller 12:30-14:00	IEEE TCSE Copier 12:30-14:00	Post Mortem Coller 12:30-14:00
ICGSE SB Dièse 12:30-14:00		ICSE'20 OC Dièse 12:30-14:00	LGBTIQ Lunch Vortex 12:30-14:00	
ICSSP SC Ste.-Catherine 18:00-20:00		Prompt/ NSERC Sherbrooke 12:45-13:30	SIGSOFT EC Coller 12:30-14:00	
ISSPA Ste.-Catherine 20:00-22:00		Facebook Annon. Viger 12:45-13:00	IST EB Dièse 12:30-14:00	
		ESEC/FSE 2019 OC Copier 18:00-19:00	ENCQOR Sherbrooke 12:45-13:30	
		TOSEM EB Coller 19:30-21:00	iTrace Meeting Dièse 14:30-17:00	
			IEEE Software Copier 18:00-19:15	
			Huawei Networking Reception Place Ville Marie 18:00-20:00	
			ICSE'20 PC/PB Van-Horne 18:15-19:15	

ACM/IEEE Town Hall

Free snacks and drinks! Celebrate award winners and learn more about the activities of IEEE TCSE and ACM SIGSOFT. Discuss issues and share ideas on how to improve the Software Engineering community. The Town Hall meeting is open to everyone at ICSE.

ENCQOR: The Why and How of 5G Innovation

This session is intended for Canadian companies and researchers wishing to learn more about 5G, the groundbreaking capabilities it offers and the use cases we are likely to see in the near future. Learn how to engage with the ENCQOR program, a \$400M public-private partnership to make Canada a world leader in fifth-generation wireless technologies through an Open Innovation Platform based on 5G. ENCQOR allows Canadian SMEs, larger corporations, and researchers from the public sector to benefit from free access to world-class pre-commercial 5G technologies and 5G innovation hubs in both Québec and Ontario.

Facebook Special Announcement for Academic Researchers in Testing and Verification

Facebook will make an announcement concerning Testing and Verification that is likely to be of interest to academic researchers working in these areas. Join the Facebook team at their special 15-minute Wednesday Lunchtime announcement session. The announcement will only take 15 minutes, but there will also be some Q&A time immediately after for those who wish to stay to ask questions.

Huawei Hosted Networking Reception

Please join us for drinks and hors d'oeuvre while overlooking Montréal from the Observatoire at the Place Ville Marie (5 Place Ville). The venue is a mere three-minute walk from the conference.

Continue...

iTrace Stakeholders Community Infrastructure Meeting

iTrace is an infrastructure to support eye tracking while using an IDE. During the meeting, the iTrace architecture will be presented along with current and future functionality. Attendees will be surveyed concerning their needs and how they might potentially use the iTrace infrastructure. Researchers currently or planning to use eye tracking equipment to study programmer behavior are invited to attend. See <http://www.i-trace.org/> for more information.

LGBTIQ Community Event

Lesbian, Gay, Bisexual, Transgender, Intersexual, and Questioning (LGBTIQ) researchers and practitioners primarily come to software engineering conferences to discuss technical aspects of their work with the research community. But we are people, too, whose rights and safety are sometimes affected by the political climate. At this year's lunch/Birds of a Feather session, LBGTIQ researchers, practitioners, and friends are invited to lunch together to build community. We will also discuss how we fit in with our academic, industry, and governmental institutions, the current political climate around the world, and what we can do to help make all software engineering conferences and workshops be safe and welcoming spaces for LBGTIQ members of the Software Engineering research community.

Power Your Innovation with Industry–Academia Partnership Funding

This session is intended for Canadian companies and researchers willing to engage in collaborative enterprise–university R&D projects. This short session will present an overview of the main programs offered by the Granting Agencies in Canada and Québec: NSERC, MITACS, Prompt. This is a unique chance to learn about each program's best-kept secrets and distinctive characteristics.

Student–Industry Lunch

To all registered students to the main ICSE 2019 conference:

You are invited to the Student–Industry Lunch on Wednesday May 29. Look for the Agora room for this lunch! Your student registration to the main conference is your entry ticket. This lunch provides you with an opportunity to interact with multiple industrial participants from the conference sponsors. Come with your questions about what working in industry is really like and what opportunities exist.

Come. Connect. Participate!

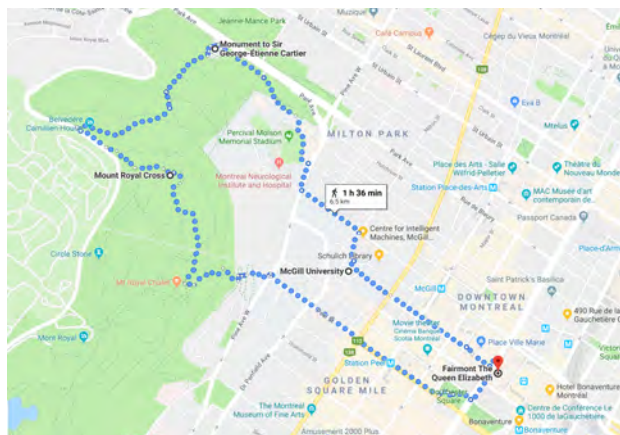
Newcomers Reception (Pavilion E, ÉTS), May 28, 18:30–20:00

First-time ICSE attendees received an invitation to attend a Newcomers Reception held on the eve of the main conference at the Maison du étudiants (Pavilion E) at École de Technologie Supérieure. The goal of this event is to give newcomers a chance to meet other first-time attendees as well as some long-time attendees in an environment where it will be easy to identify others with similar research interests. Long-time attendees are enthusiastic to provide you a warm welcome to ICSE!

ICSE Reception (Fairmont), May 29, 19:30–21:30

Montréal has some amazing destinations (See our page on Montréal Highlights), but none of them have the capacity to hold ICSE! Instead, the ICSE Reception will focus on exceptional food and exceptional company. Mix and mingle with conference attendees on the Fairmont convention floor after the ACM/IEEE Town Hall meeting.

ICSE Morning Run (Mont Royal), May 30, 7:00/6:30–8:15



As per ICSE tradition, there will be a morning run – up to Mont Royal! We leave the Fairmont lobby at 7:00am sharp and will head north on Rue Peel, through the Golden Square Mile and begin our ascent towards the Mont Royal Chalet. On reaching the Chalet, there will be a stop for photos with stunning views of downtown Montréal and the St. Lawrence Seaway. After catch-

ing our breath, we will proceed through the park to the Mont Royal Cross, for a northeastern view of Mile End and the Olympic Stadium. Finishing our descent, we will head towards the Sir George-Étienne Cartier Monument. As we return downtown, we will make our way through McGill University, returning to the Fairmont by 8:15am, in time to shower and enjoy the morning sessions. The route is 6.5km. Expect a mix of pavement and dirt trails, with a steep 231 metre ascent and leisurely descent. Runners should be reasonably fit. **Register in Advance!**

If you want to experience Mont Royal and the views, but not at a sprint, there will be a walk from the Fairmont to the Mont Royal Chalet and back. We leave from the hotel lobby at 6:30am sharp, to have time to climb, enjoy, and be back by 8:15am. **Register in Advance!**

ICSE Soccer (Molson Stadium), May 30, 16:30–18:00

Another tradition! The ICSE soccer game will take place at McGill University's Molson Stadium. We leave from the Fairmont lobby at 15:45pm (it is a 20 min walk to the field).

If you are late, then ask for directions to the Molson Stadium at 475 Pine Ave West. We have access to two change rooms 30 minutes before and after game time. Bring clothing and shoes suitable for field turf. We will provide soccer balls, pinnies, and water. **Register in Advance!**



ICSE Banquet (1909 Taverne Moderne), May 30, 19:30–00:00



On Thursday night, ICSE takes over all three floors of 1909 Taverne Moderne.

The Taverne is known for its locally-sourced cuisine and its wide selection of local draft beers. Some of the internationally-known culinary specialties of Québec include artisanal cheeses, maple-flavored dishes, and yes, poutine!

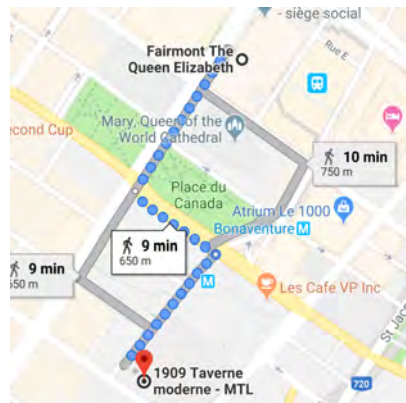
The venue boasts the largest digital screen in Canada, on which we'll show photos from this year's ICSE as well as photos from past ICSEs. Look for familiar faces.

The music starts at 9:30pm and continues until midnight. With three floors to choose from, you can socialize on the top floor or dance the night away on the lower floors.

Remember to wear your conference badge and bring your banquet ticket – you will need both to get in the door.

The venue is a 10min walk from the Fairmont hotel:

1909 Taverne Moderne
1280, Avenue des Canadiens-de-Montréal
Montréal (Québec) H3B 5G0



Canada is the second largest country in the world by area (9.98 million km²), and the 38th largest country in the world by population (over 37 million). Almost 80% of the country is wilderness, with much of the northern provinces sitting on a vast rock base called the Canadian Shield, known for its minerals: emeralds, diamonds, and copper.



The Canadian flag is relatively young (1965). The maple leaf has been used as a Canadian national symbol since the late 1800s, when it appeared on the coats of arms of the country's two largest provinces. The number of points on the leaf has no special significance; the shape of the leaf was chosen because it was deemed to be least blurry in high winds.

Canada's best-known icons include Bombardier, CAE (flight simulators), IMAX technology, Cirque du Soleil, ice hockey, parkas, and maple syrup. It also is the home of Santa Claus; any letter in any language that is addressed to the North Pole HoHoHo will receive a reply. The official phone number for Canada is: 1-800-O-Canada.

Québec is the largest province by area (1.67 million km²), and the second largest province by population (8.4 million). It's over 400 years old. Québec City (NOT Montréal) is the capital of Québec. French is the sole official language, but the vast majority of the population speaks both French and English.



The flag of Québec, which is often called the Fleurdelisé, includes four fleurs-de-lis, which are a stylized lily that is symbolic of the province's French heritage.

Provincial policy stipulates that approximately 1% of the total construction budget of a public building or site must be devoted to the integration of a work of art – which is one reason that Montréal's art scene is so rich.

Montréal is the 4th largest French-speaking city in the world (population 4 million). It resides on an island in the St. Lawrence River.

The symbols on the city's flag represent the backgrounds of the original settlers of the city: the Indigenous peoples (white pine), the French (Fleur-de-lys), the English (Rose of Lancaster), the Irish (shamrock), and the Scots (thistle).



Montréal hosted Expo 67 and the 1976 Summer Olympics, which are responsible for many of the city's iconic buildings, such as the Olympic Stadium with its 45° inclined tower, the Montréal Biosphere, and the Montréal Casino.

Tourisme Montréal has compiled a list of “greatest hits” of what to see and do in this diverse and exciting city.

Walk up Mount Royal

The “mountain” park at the heart of the city is the city’s most iconic landmark, and the most popular place to snap a Montréal selfie. Reach the viewpoint at the top of Mount Royal Park by walking up Peel Street until you reach the stairs, then keep going....

Old Montréal

A first-timer’s visit to Montréal is not complete without meandering through the charming cobblestone streets of the city’s old district. Stop at Notre-Dame Basilica for a glimpse at the incredible stained-glass art. Head to historic Place Jacques-Cartier and install yourself on a terrace, and be entertained by street performers and portrait artists.

Try a Digital Scavenger Hunt

Cité Mémoire transforms Old Montréal into a giant open-air museum. Each Tuesday to Sunday, from dusk to 11:00pm, videos project historical characters onto trees, walls, the ground, you name it. Download the free app, Montréal en Histoires, and have the installations explained to you.

Old Port

The river and multi-purpose paths offer a plethora of outdoor activities including jogging paths, water sports, and the Montréal Observation Wheel.

Market Yourself

One of the best ways to savour the city is to visit one of the local public markets. Marché Jean-Talon is the largest and most culturally diverse market in Montréal. The smaller Art Deco-style Marché Atwater offers an array of specialty products and delicatessen treats.

Go “Underground”

Montréal contains a vast network of pedestrian walkways beneath street level. Grab a PDF map and get started on a truly “sub” urban adventure.

Jazz by Night

Montréal has a rich and thriving jazz and blues scene with concerts in nightclubs. Many hot spots specialize in local jazz and blues, with acts seven nights a week.

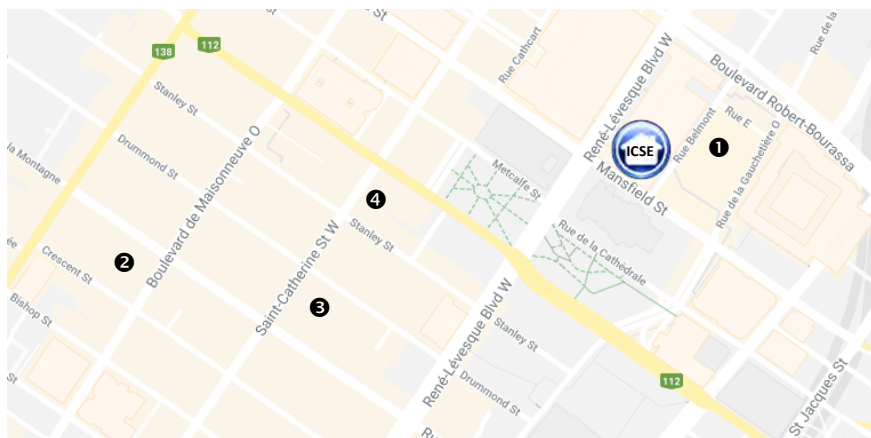
Find Your Art Beat

Art-inclined visitors will relish the multiple museums and galleries, home to both historic and modern works. Even just walking down the street – Montréal has incredible street art in the form of murals and public art installations. It’s a feast for the eyes!

Montréal’s East End

Montréal’s eastern neighbourhood of Hochelaga-Maisonneuve (HoMa for short) is home to several exceptional attractions all within walking distance of each other, including the Olympic Stadium and the internationally renowned Montréal Botanical Garden.

For more ideas and for assistance, please visit the Tourisme Montréal exhibitor table Wednesday, Thursday, and Friday.



ICSE is NOT providing breakfast – but that is OK. The Fairmont hotel (the conference venue) has an exceptional breakfast for a price. There are also plenty of places near the hotel where you can have a sit-down breakfast or grab something to-go.

Breakfast: See the map for sit-down breakfast restaurants

❶ Montréal Central Station Food Court (many options just down the escalators from the Fairmont: *Dame Nature*, *Deli Planet*, *Boulangerie Première Moisson*, *Jugo Juice*, *Second Cup*, *Tim Hortons*...; some open from 7:00 Mo-Su)

❷ *Eggsspectation* (1313 De Maisonneuve West; open from 6:00 Mo-Su)

❸ *Cora* (1240 Drummond St; open from 6:00 Mo-Sa, 7:00 Su)

❹ *Reuben's Deli & Steakhouse* (1116 Ste-Catherine West; open from 8:00 Mo-Su)

Coffee: There are too many exceptional coffee places to list, and most are too small for all of ICSE to descend on them. See (<https://montreal.eater.com/maps/best-cafes-coffee-shops-montreal>) for a large number of recommendations.

Beer: Ditto for brewpubs. They are exceptional, small, and popular. Try one out, but time your visit carefully if you want a seat or a table. Eater Montréal has multiple suggestions: (<https://montreal.eater.com/maps/best-montreal-brewpubs-beer-bars>).

Dinner: Montréal has more restaurants per capita than San Francisco or New York City, and somehow most of them are above average – we cannot explain the math. You can find exceptional international cuisine of all kinds: French (of course!), but also Greek, Indian, Italian, Portuguese, Sushi, and Thai. The peak hour for dinner is around 19:00, but many restaurants are open late. For popular fine dining restaurants, a reservation is a must.

Cheap Favorites: (not on the map) *Arepera* (73 Prince Arthur St East), *Coco Rico* (3907 St-Laurent Blvd), *Cinko* (1641 St-Denis St), *Mai Xiang Yuan* (dumplings) (1082 St-Laurent Blvd), *Hippie Poutine* (3482 St-Denis St), *La Capital Tacos* (1096 St-Laurent Blvd), *Schwartz's* (3895 St-Laurent Blvd).

For everything else, TripAdvisor, Yelp, and Eater Montreal will help you find what you are looking for.

Transportation


Taxi: Taxis are readily available outside the airport and hotels. A trip from the airport to downtown Montréal (or vice versa) will cost you a flat rate of \$41. It is easy to flag one down on the street.


Metro/Bus: Montréal is a very walkable and safe city. However, if you need to travel further distances, the public transportation system is fast and convenient. The Metro (underground subway) typically operates between 5:30am to 1:00am. The network of bus routes is extensive. A one-trip fare is \$3.25, or cheaper with a more expensive fare card:


- Two Trips: \$6
- One Day: \$10
- Three Days: \$19
- Unlimited Evening: \$5.25
- Unlimited weekend: \$13.75
- Weekly pass: \$26.25

Express Bus to Airport: There is an express bus that services the airport (747 Express Bus). A one-way fare card costs \$10 and serves as a transit pass on the STM bus and metro network for 24 hours.

Get the App

So Montréal  – Discover all of the attractions and things to do in Montréal. This app is a cultural calendar for the city!

Transit  – One source for all transportation options, timings, and routes. Developed in Montréal, works in 114 cities.

MAPS.ME  – Fast, detailed and entirely offline maps with turn-by-turn navigation. Includes directions to points of interest as well as to shops.

Currency and ATM Machine

American dollars are accepted at a few places around town, but you need Canadian dollars for most business transactions. Bills start at \$5 and each denomination comes in a different colour of the rainbow. The \$1 coin with the loon imprinted on its golden surface is called a Loonie, while the \$2 coin is known by its nickname the Toonie.

There is no ATM in the conference hotel, but there is an ATM at TD Canada Trust just down the street; and an ATM at the Royal Bank of Canada, just across René-Lévesque Blvd. from the hotel.

Emergency Information

Call 911 in case of emergency for ambulance, fire department, or police.

For non-emergency situations (e.g., you need to see a doctor), call the conference hotel (514-861-3511). The hotel staff can direct you to a medical clinic. Note that all ten digits must be dialed for a local call in Montréal.

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Daniel Varro, *McGill University, Canada*

Workshops:

Sven Apel, *University of Passau, Germany*

David Lo, *Singapore Management University, Singapore*

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Daniel Amyot, *University of Ottawa, Canada*

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Christian Kästner, *Carnegie Mellon University, USA*

Lin Tan, *Purdue University, USA*

Doctoral Symposium:

Laurie Williams, *North Carolina State University, USA*

Sílvia Abrahão, *Universitat Politècnica de València, Spain*

New Faculty Symposium

Matt Dwyer, *University of Virginia, USA*

Natalia Juristo, *Universidad Politécnica de Madrid, Spain*

Student Volunteers:

Ivan Beschastnikh, *University of British Columbia, Canada*

Shane McIntosh, *McGill University, Canada*

Awards:

Lionel Briand, *University of Luxembourg, Luxembourg*

Domenico Bianculli, *University of Luxembourg, Luxembourg*

Most Influential Paper ICSE N-10:

Paola Inverardi, *University of L'Aquila, Italy*

Social: Martin Robillard, *McGill University, Canada*

Web:

Igor Ivkovic, *University of Waterloo, Canada*

Mei Nagappan, *University of Waterloo, Canada*

Cassiano Monteiro, *University of Waterloo, Canada*

Lakshmanan Arumugam, *University of Waterloo, Canada*

Registrations: Weiye Shang, *Concordia University, Canada*

Proceedings:

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Publications: Ladan Tahvildari, *University of Waterloo, Canada*

Deputy Conference:

Jin L.C. Guo, *McGill University, Canada*

Eugene Syriani, *Université de Montréal, Canada*

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Newcomers:

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Communications: Dan Berry, *University of Waterloo, Canada*

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Data Czar: Foutse Khomh, *Polytechnique Montréal, Canada*

IEEE Conference Planner:

Daria Shypova, *IEEE Computer Society, USA*

Please join us for a cocktail reception

Thursday, May 30, 2019

18:00 – 20:00 (6:00 – 8:00 PM)

Place Ville Marie Observatoire
(5 Place Ville Marie, Montreal)

RSVP here



Please join us for an evening of casual networking over drinks and hors d'oeuvres, while overlooking Montréal from the Observatoire at the Place Ville Marie. The venue is a mere three minute walk from the conference.



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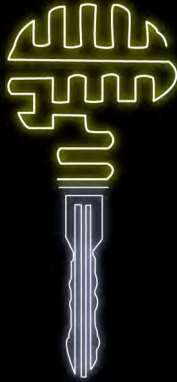
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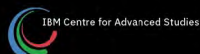
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818

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KEYNOTES



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3. Visit our stand each day to tell us the answer to that day's clue. If you're among the first 50 people to do so, you'll receive our mystery daily prize.
4. When you uncover the complete phrase, head to [monash.edu/it/research/se/win](#) to submit your answer. If correct, you'll go into the draw to WIN* an Oculus Go valued at US\$264. Entries close 3pm on 31 May.

* See full terms and conditions at [monash.edu/it/research/se/win](#)

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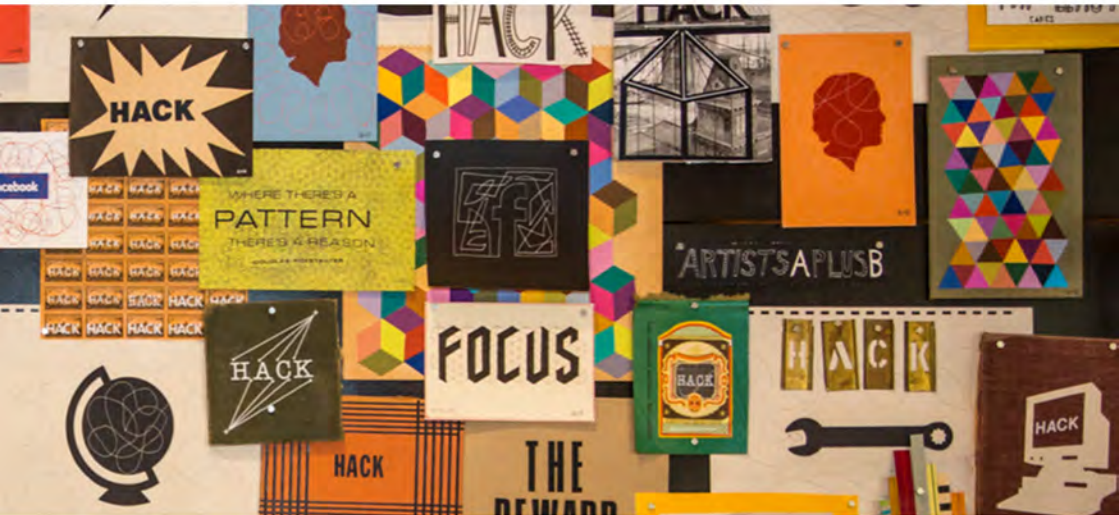


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¹ Dimitra Karanatsiou, Yihao Li, Elvira-Maria Arvanitou, Nikolaos Misirlis, and Eric Wong. "A bibliometric assessment of software engineering scholars and institutions (2010–2017)." *Journal of Systems and Software* 147 (2019): 246-261.

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Join us during the luncheon on **Wednesday, May 29th** for a special announcement regarding new research award opportunities.

You can also visit our booth after the luncheon for more details!

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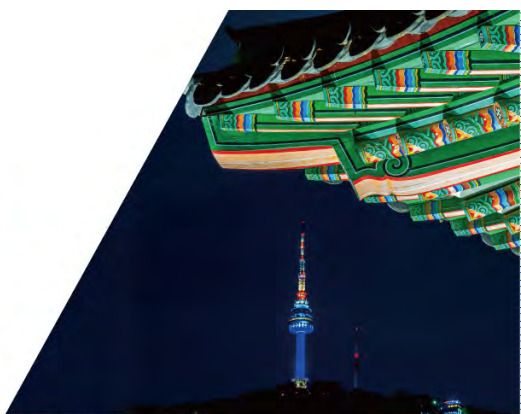
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ICSE 2020



Submission Dates

Technical Papers	August 23, 2019
Workshop Proposals	October 5, 2019
Software Engineering in Practice	October 15, 2019
New Ideas and Emerging Results	October 15, 2019
Software Engineering Education and Training	October 29, 2019
Software Engineering in Society	October 29, 2019
Doctoral Symposium	November 19, 2019
Demonstrations	December 20, 2019
ACM Student Research Competition	January 3, 2020
Workshop Papers	January 22, 2020
Student Volunteers	January 22, 2020
Posters	February 11, 2020



conf.researchr.org/home/icse-2020
icse2020@icse2020.org

To: CS undergraduate students, graduate students, postdoctoral fellows, professors

Subject: David R. Cheriton School of Computer Science, University of Waterloo

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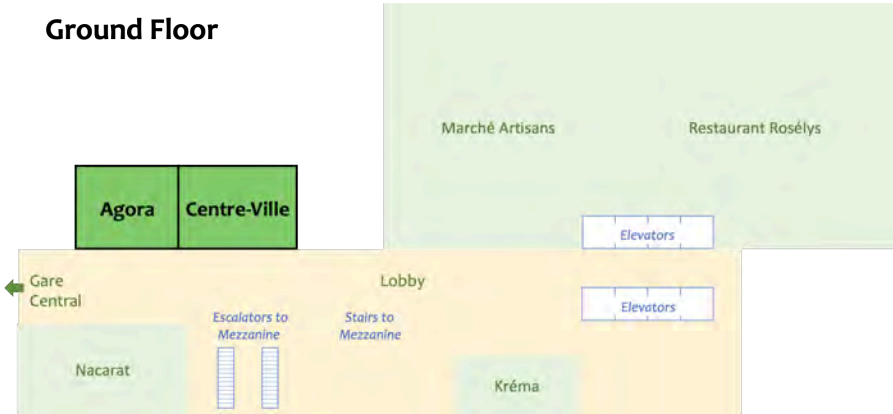
Send

Conference Map

The conference will be held at the Fairmont The Queen Elizabeth Hotel, one of Montreal's most iconic landmarks. Conference meetings will take place in rooms that are on three floors of the hotel.

Ground Floor: Some conference sessions and special lunch events (the student-industry networking lunch, and the Rose Festival) will take place in meeting rooms that are off the Lobby (across from the hotel's bar).

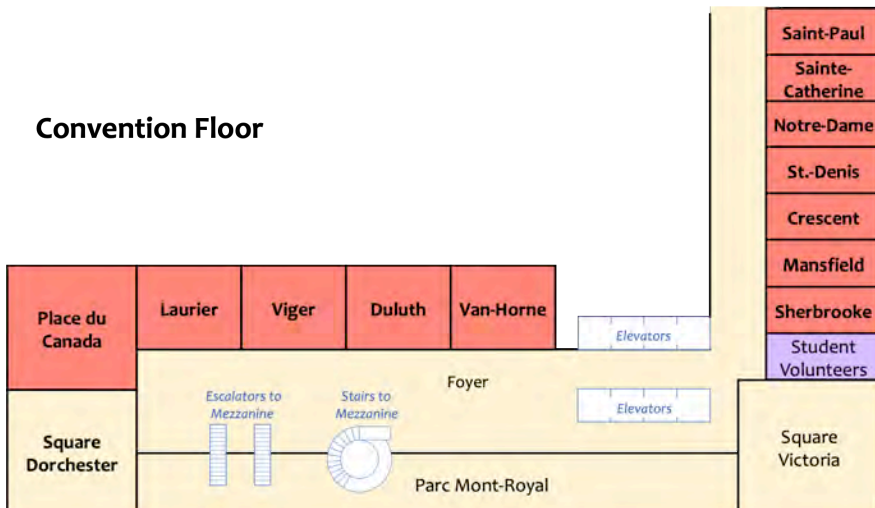
Ground Floor



Mezzanine Floor: Registration is located on this floor, directly above the Ground Floor.

Convention Floor: The conference plenary sessions, most conference sessions, and most co-located events and larger workshops will take place on this floor, which is directly above the Mezzanine Floor.

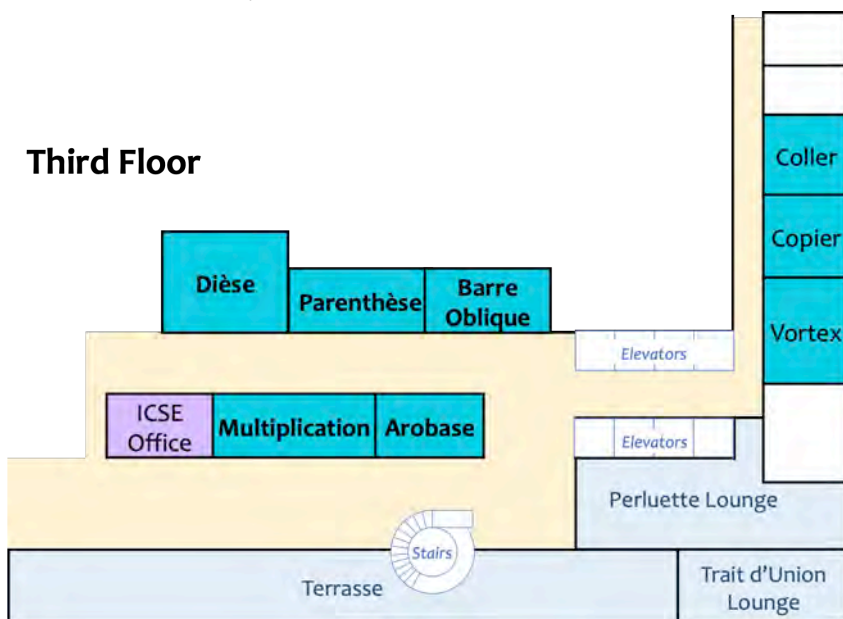
Convention Floor



Conference Map

Third Floor: Some workshops and community events will take place in meeting rooms on this floor, which is directly above the Convention Floor.

Third Floor



WiFi Network

Access: Fairmont_meeting

PIN/Password: icse2019

ICSE 2019 Online Proceedings

URL: <https://conferences.computer.org/icse/2019>

Login: icse19

Password: conf19//

ICSE Code of Conduct

Anyone witnessing or subject to unacceptable behaviour should notify a conference committee member or venue staff or security, or report the incident to IEEE via eventconduct@ieee.org. If you feel that you or someone around you is in immediate danger, please dial 911 (police, fire, ambulance).

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