



IEEE

IEEE ComSoc
IEEE Communications Society

IEEE International Conference on Blockchain and Cryptocurrency

Final Program

2-6 May 2020

Patrons



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Program-at-a-glance (All time EDT)

Time	Day 1 - Sat, May 2
9:45 AM - 10:00 AM	Informal Conference Opening
10:00 AM - 12:00 PM	Poster/Demo Session 1A, 1B, 4A, 4B
12:00 PM - 12:30 PM	Exhibition: Blockchain Research Institute
12:30 PM - 1:00 PM	Exhibition: Huawei
1:00 PM - 3:00 PM	Poster/Demo Session 2A, 2B, 5A, 5B
3:00 PM - 3:30 PM	Exhibition: Palliums/Violas
3:30 PM - 4:00 PM	Exhibition: Runtime Verification
4:00 PM - 5:00 PM	Poster/Demo Session 3A, 3B
5:00 PM - 6:00 PM	Break
6:00 PM - 6:30 PM	Exhibition: Algorand
6:30 PM - 7:00 PM	Exhibition: Conflux
7:00 PM - 9:00 PM	Break
9:00 PM - 10:00 PM	Poster/Demo Session 6A, 6B

Time	Day 2 - Sun, May 3	
	ICBC Virtual Conference	US and Canadian Blockchain Olympiad
9:00 AM - 11:00 AM	Tutorial 1 and Tutorial 6	First block of presentations (10:00 AM - 11:30 AM)
11:00 AM - 11:30 AM	Exhibition: Palliums/Violas	
11:30 AM - 1:30 PM	Tutorial 2 and Tutorial 5	Lunch break for participants (11:30 AM - 12:30 PM)

1:30 PM - 2:00 PM	Break	Second block of presentations (12:30 PM - 2:00 PM)
2:00 PM - 2:30 PM	Exhibition: Huawei	Deliberation time (2:00 PM - 4:00 PM)
2:30 PM - 4:30 PM	Tutorial 3 and Tutorial 7	
4:30 PM - 5:00 PM	Exhibition: Conflux	Judge Announcements (4:30 PM - 5:00 PM)
5:00 PM - 7:00 PM	Tutorial 4 and Tutorial 8	

Time	Day 3 Mon May 4	Day 4 Tue May 5	Day 5 Wed May 6
8:30 AM - 9:30 AM	Short Papers Session 1	Technical Session 4	Short Papers Session 3
9:45 AM - 10:00 AM	Opening Statement	Break	Break
10:00 AM - 11:15 AM	Keynote 1 Don Tapscott, BRI	Keynote 3 Vitalik Buterin, Ethereum	Keynote 4 Dinesh Shah, Bank of Canada
11:15 AM - 12:30 PM	Technical Session 1	Technical Session 5	Technical Session 7
12:30 PM - 1:00 PM	Exhibition: Palliums/Violas	Exhibition: Algorand	Exhibition: Blockchain Research Institute
1:00 PM - 1:30 PM	Exhibition: Conflux	Exhibition: Runtime Verification	Exhibition: Huawei
1:30 PM - 2:45 PM	Technical Session 2	Technical Session 6	Technical Session 8

2:45 PM - 3:00 PM	Break		
3:00 PM - 4:15 PM	Technical Session 3	Industrial Panel Moderator: Alex Tapscott (BRI) <ul style="list-style-type: none"> • Edmund Moy (United States Mint), • Vitalik Buterin (Ethereum), • Addison Cameron-Huff (Toronto Blockchain Week), • Perianne Boring (Chamber of Digital Commerce) 	Technical Session 9
4:15 PM - 4:30 PM	Short Papers Session 2		Break
4:30 PM - 4:45 PM			Technical Session 10
5:00 PM - 5:15 PM			
5:15 PM - 5:30 PM	Break		
5:30 PM - 5:45 PM	Keynote 2 Christian Catalini, Libra/Calibra/MIT		Closing Acknowledgments, Best Paper Awards and ICBC 2021 presentation
5:45 PM - 6:00 PM			
6:00 PM - 6:15 PM			
6:15 PM - 6:30 PM			

Message from the ICBC2020 General and Technical Program Chairs

On behalf of the IEEE Communications Society (ComSoc), the Organizing Committee (OC) is delighted to invite you to the 2nd International Conference on Blockchain and Cryptocurrency (ICBC 2020) being held as a decentralized fully virtual event between May 2 and May 6, 2020.

ICBC 2020 is the second instalment of IEEE ComSoc sponsored conference on Blockchain and Cryptocurrency. It is the Society's primary forum for reporting the latest research results and innovations, regulations, standards, industry practice innovations, and policies in the exciting, emerging and challenging area of blockchain and cryptocurrencies. Originally set to take place at the state-of-the-art Myhal Auditorium at the University of Toronto, Canada during May 3-6, 2020, the conference mitigated to a virtual environment adding one day so to address travel/health guidance by international and domestic agencies due to global safety measures against the COVID-19 pandemic. However, as facts show, the technical contribution of IEEE ICBC was not compromised. In detail, the OC has compiled an outstanding technical program that features world-class presentations by internationally renowned researchers. Along with a cutting-edge technical session, IEEE ICBC provides the means and ample opportunities to network with like-minded researchers and professionals from around the world. It also features a set of prominent keynote and panel speakers including Don Tapscott of BRI, Vitalik Buterin of Ethereum, Ed Moy of the US Mint, Dinesh Shah of the Bank of Canada and Christian Catalini of MIT/Libra, among others. The Canadian Blockchain Olympiad was also scheduled to run during ICBC2020. However, given the current environment and with the health and safety of our participants as our primary priority, the OC has decided to also deliver the Olympiad as a decentralized fully virtual competition.

We are excited for the opportunity to innovate by creating an engaging virtual conference that will be rewarding for both presenters and attendees. In more detail, the ICBC2020 program includes four keynotes from research and industry leaders, as well as a plenary session with 30 full papers and 14 short papers. On May 2, 2020 the virtual conference will present 32 posters and 7 demonstrations showcasing the latest industrial innovations in the area. In addition to the main program, on May 3, 2020, ICBC2020 will offer 8 cutting-edge technical tutorials on important aspects of blockchain and cryptocurrency technology, but also live coverage of the Canadian Blockchain Olympiad. An industrial panel with prominent members will take place on May 5, 2020. Along with the actual technical program, dedicated chat forums will allow the conference participants communicate with authors and other members of the international blockchain/cryptocurrency research community on the latest technology advances in the field. The current plan also includes recording all sessions those five days to archive them in the conference's web site.

Another aspect that cannot be neglected is the fact that this year ICBC2020 received 203 submissions (full/short-papers, demo and posters) from 36 countries. This represents approximately a 35% increase of submissions from last year. Of these submissions 32% were from North America, 31% from Asia, 28% from Europe, 4% from South America, 3% from Australia, and 2% from Africa. Following this, each submission received on the average 4.2 reviews while many of them received as much as 6 reviews (and no less than 3 reviews). As such, ICBC2020 remains grateful to the timeless effort of about 180 Technical Program Committee (TPC) Members who provided this level of excellence in providing comprehensive reviews to all authors. Further, in a live decentralized meeting that lasted 7 hours and it was attended by more than 25 TPC members from five continents, 30 full papers were accepted to be presented in the conference's plenary session. This corresponds to a competitive acceptance rate of about 21%. Due to the high calibre of submitted material, short papers and poster presentations were also selected for presentation during that on-line TPC meeting.

Admittedly, following the momentum set by the inaugural conference in Seoul, Korea in 2019, all the above facts demonstrate that today the international blockchain and cryptocurrency community has embraced IEEE ICBC as the premiere global peer-reviewed technical event to disseminate its research and innovation results.

We like to express our deepest and most sincere gratitude to the kind effort of our volunteers from the University of Toronto (who handled most of the virtual event duties in a very short notice), OC members, TPC members, Steering Committee members for their dedication, support, and contributions during these trying times. We would also like to thank our conference patrons and sponsors, namely Blockchain Research Institute, Huawei, Violas, Algorand, Conflux, Runtime Verification, for their continued support at a time of high uncertainty. Lastly, our acknowledgement goes to the IEEE ComSoc leadership and the Society’s front office (Jimmy Lee, Bruce Worthman, and Nancy Sun) for their timely trust and support that helped set forward the success of ICBC2020 in those globally challenging times.

Without the help and support of all the people above ICBC2020 would not have been possible. We wish all an exciting, informative, pleasant, and eventfully decentralized ICBC2020!



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Veneris
*Technical
Program Chair*

Salil Kanhere
*Technical
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Grigore Rosu
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Knottenbelt
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Wenjuan Li - City University of Hong Kong
William Knottenbelt - Imperial College
Wolfgang Klas - University of Vienna
Xueqin Liang - Xidian University, China and Aalto University
Yang Xiang - Swinburne University of Technology
Youngjoon Won - Hanyang University
Youngseok Lee - Chungnam National University
Yu Chen - San Jose State University
Yuliang Zheng - University of Alabama
Yunhui Zhuang - City University of Hong Kong
Zeki Erkin - Delft University of Technology

Virtual Conference Instructions

General Tips for All Participants

Basic Session Structure:

- 10 minutes before the Session: The host will start the designated WebEx meeting.
- 2 minutes before the Session: The host will start the recording.
- 1 minute before the Session: The Session Chair introduces the session.
- Beginning of the Session: The Session Chair will introduce the presenter. The talk will be presented using the video recording submitted by the presenter.
- The duration of presentation by type are listed below:

Type	Video Duration	Q&A Duration
Full papers	20 minutes	4-5 minutes
Short papers	12 minutes	2-3 minutes
Posters / Demos	8 minutes	5 minutes
Tutorials	live talk (~90 minutes)	25 minutes**

** The speaker will take questions “on the fly” by the participants for roughly a total of 25min of tutorial Q&A (per tutorial). The total duration of a tutorial session is around 115min.

- A live Q&A Session will follow each talk (except for tutorials), moderated by the Session Chair:
 - Participants will be muted and they will need submit questions during the video presentation (aka, before the Q&A Session).
 - The Session Chair will select and ask the questions during the Q&A session. We understand that there maybe not time to ask all the questions. The Chair will make sure to ask complementary questions and hopefully according to the time they were first submitted.
 - The Chair will have the ability to unmute participants if this is needed to elaborate on their questions (please note that due to the limited Q&A duration, participants may want discuss with the author(s) off-line).
 - A Google Drive channel will be available if the paper author and attendees want to have a further conversation following the Q&A.

Useful Links:

- [Conference website](#)
- [Online program](#)

- [Download and install Webex](#)

WebEx Tips:

- Each Session will have a host, a Session Chair, a presenter and participants.
- Host: will be the user with a special icon by the side of the profile. This person facilitates the use of the technology and could be the same person as the Session Chair in some Sessions. (NAME: Host * or Chair *).
- Session Chair - This person is present to coordinate the Session and manage Q&A. (NAME: Chair *).
- For a stable connection to the meeting please check: [Webex Best Practice](#)

Instruction for Attendees

Initial WebEx setup:

Please [install WebEx extension to your browser](#) in advance.

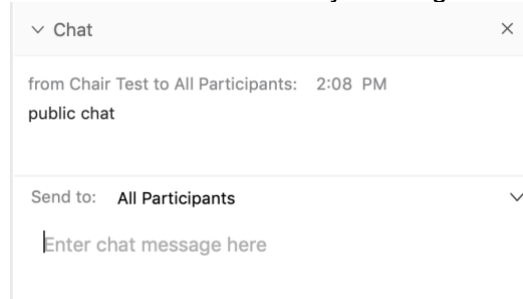
Note: It is recommended to install a browser extension as WebEx events are supported better on an extension. We also note that the extension only works on some versions in Linux System.

How to join the Session:

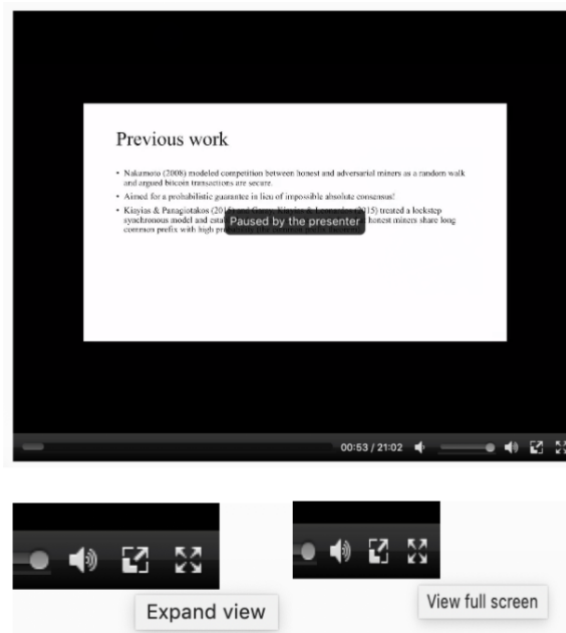
1. An access-controlled page will be created on our website which will list all the WebEx meeting invites. You will be provided with the required credentials before the conference.
2. Using the invite on our page you can join a WebEx session by clicking on the link to join the meeting.
3. If you are joining the Session before the host has started the meeting, please wait in the lobby until the host starts the Session.

During the Session:

1. Session Chair will **mute your microphone during the complete Session**. In case you would like to ask any questions please read the instructions below.
2. You can join the discussion with other attendees by sending messages to "All Participants".



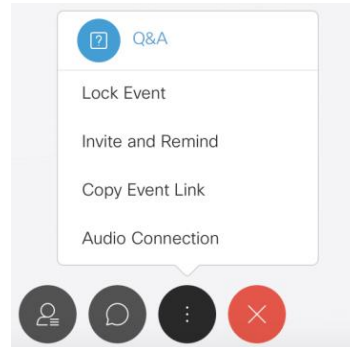
3. You are welcome to use private chat to direct questions to the Session Chair (NAME: Chair *).
4. When watching the replay of the presentation video, you can adjust the volume of the video/enlarge the view using the embedded player. To get the maximum view of the video, we suggest attendees to expand and view the video in full screen.



5. During the replay of presentation video, you are welcome to ask questions. The instructions are found in the Q&A section below.
6. You do not need to announce yourself arriving or leaving a Session.

Q&A Session:

1. As organizers, we would like to ensure a smooth and productive virtual conference. Following the video presentation there is a short Q&A session.
2. We request participants to use Q&A panel on the side-panel on the right of the WebEx window. If not shown, one can click on the icon shown below to enable the Q&A panel.



3. You can post your questions in the Q&A window anytime during the Session. If you need to refer to the presentation, please indicate clearly the page number of the slides. If there is no page number available, please note down the time of the relevant content.
4. At the end of the talk, the Session Chair will select and ask the presenter to answer some of the questions in sequence they were submitted and within the allotted Q&A period.
5. The Session Chair will try to cover as many questions as possible depending on the allotted time. In case, some of the questions have not been answered we would request participants to use discussion boards for the same purpose.

Discussion Boards:

1. We will be providing links to Google Drive location for each Session in an access-controlled page. You will be granted credentials before the conference starts.
2. A list of discussion boards for each submission will be enabled in the Google Drive.

3. These boards can be used as offline discussion panels between participants and authors following the Q&A presentation.

Breaks:

Conferencing, online and in-person can be exhausting! We need to take breaks. We will take breaks. Breaks are built-in to the schedule!

- Stand up and stretch, get a snack, come back refreshed!
- If you leave WebEx on, make sure that your microphone is muted during the break.

Instruction to Presenters:

Initial WebEx setup:

Please [install WebEx extension to your browser](#) in advance.

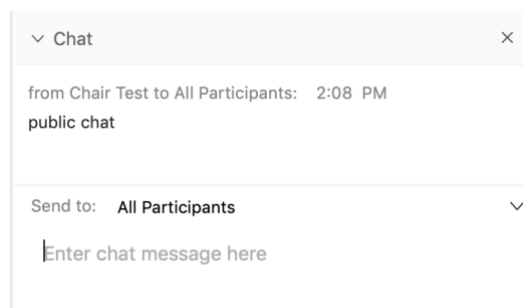
Note: It is recommended to install a browser extension as WebEx events are supported better on an extension. We also note that the extension only works on some versions in Linux System.

How to join the Session:

1. An access-controlled page will be created on our website which will list all the WebEx meeting invites. You will be provided with the required credentials before the conference.
2. Using the invite on our page you can join a WebEx session by clicking on the link to join the meeting.
3. If you are joining the Session before the host has started the meeting, please wait in the lobby until the host starts the Session.
4. Please join at least 5 minutes before your designated time slot and be present during the video playback as well as the Q&A session. You are welcome to stay in the session as an attendee when not presenting.

During the Session:

1. Session Chair will **mute your microphone during the video playback**. You can join the discussion with the attendees by sending messages to "All Participants".

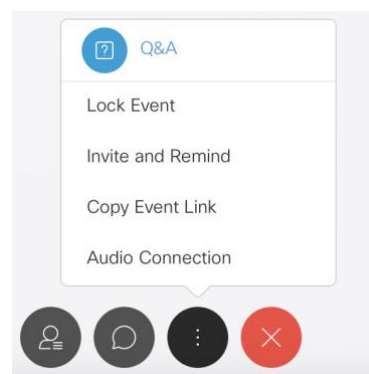


2. You are welcome to use private chat to direct questions to the Session Chair (NAME:

- Chair *).
3. During the replay of presentation video, attendees will ask questions related to the presentation through the Q&A feature of WebEx. The instructions are found in the Q&A section below.

Q&A Session:

1. As organizers, we would like to ensure a smooth and productive virtual conference. Following the video presentation there is a short Q&A session.
2. We request participants to use Q&A panel on the side-panel on the right of the WebEx window. If not shown, one can click on the icon shown below to enable the Q&A panel.



3. Attendees will post questions in the Q&A window during the video playback. You are encouraged to keep an eye on the questions so to answer them during the Q&A Session.
4. At the end of the talk, the Session Chair will unmute you and ask you to answer some of the questions in sequence they were submitted and within the allotted Q&A period.
5. The Session Chair will try to cover as many questions as possible depending on the allotted time. In case, some of the questions have not been answered we would request participants to use discussion boards for the same purpose.

Discussion Boards:

1. We will be providing links to Google Drive location for each Session in an access-controlled page. You will be granted credentials before the conference starts.
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3. These boards can be used as offline discussion panels between participants and authors following the Q&A presentation.

Breaks:

Conferencing, online and in-person can be exhausting! We need to take breaks. We will take breaks. Breaks are built-in to the schedule!

- Stand up and stretch, get a snack, come back refreshed!
- If you leave WebEx on, make sure that your microphone is muted during the break.

Technical instructions to Session Chairs:

Initial WebEx setup:

Please [install WebEx extension to your browser](#) in advance.

Note: It is recommended to install a browser extension as WebEx events are supported better on an extension. We also note that the extension only works on some versions in Linux System.

Before a session:

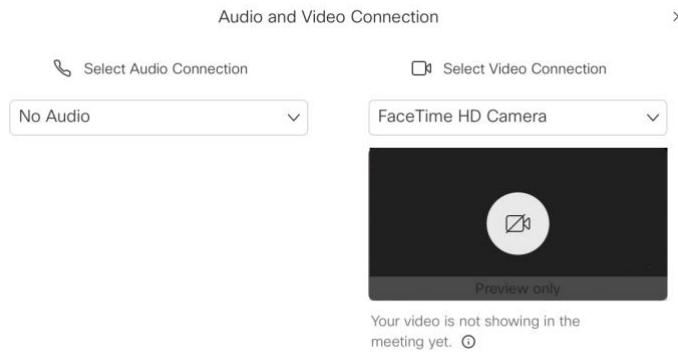
1. Before the conference, presentation videos along with presenter vita will be made available on Google Drive.
2. ***Please make sure to download all the presentation videos to your own personal computer for the sessions in advance.***
3. **Although the IEEE ICBC Committee will video-proof the submissions, we appreciate if Session Chairs also do the same (for video quality, audio quality, running time, etc) check the videos of their sessions beforehand and report any problems to the Organizing Committee no later than Monday April 27.**
4. Please make sure to have the presenters' vitas printed somewhere to introduce them timely before each presentation.

How to join a session:

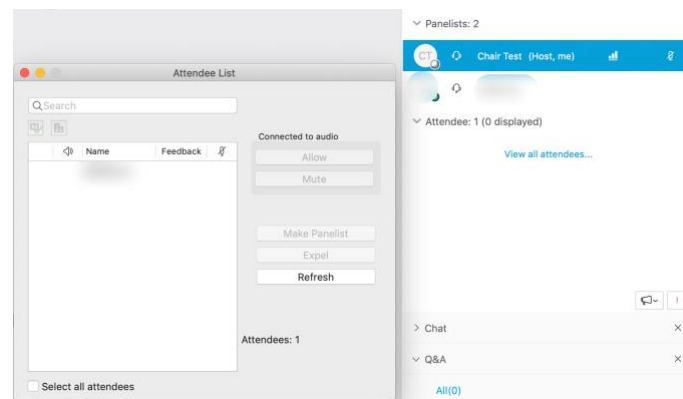
1. An invitation email will be sent before the session. You will be provided with the required credentials before the conference.
2. Using the invite, you can join a WebEx session by clicking on the link to join the meeting. Please set your first name as "Chair" and last name as your full name so to indicate your role.
3. If you are joining the session before the host has started the meeting, please wait in the lobby until the host starts the session.

During the session:

1. Please join the session 10 minute in advance, please **test your microphone** once joined so that the session can start on time.
2. We recommend that you **turn on** your video to engage the attendees during the sessional introduction. This can be done by selecting video connection when joining a WebEx meeting as shown below.

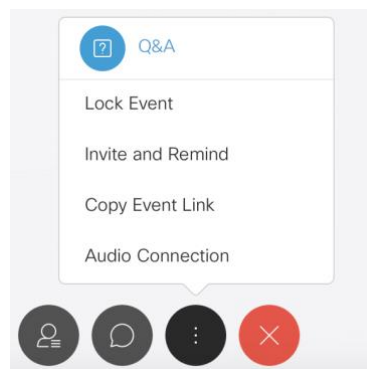


3. After introducing the session and the first presenter, we recommend you turn off the video so that the attendees can focus on the talk video.
4. You can manage the attendee by clicking on the “View all attendees” link under the Attendee panel.

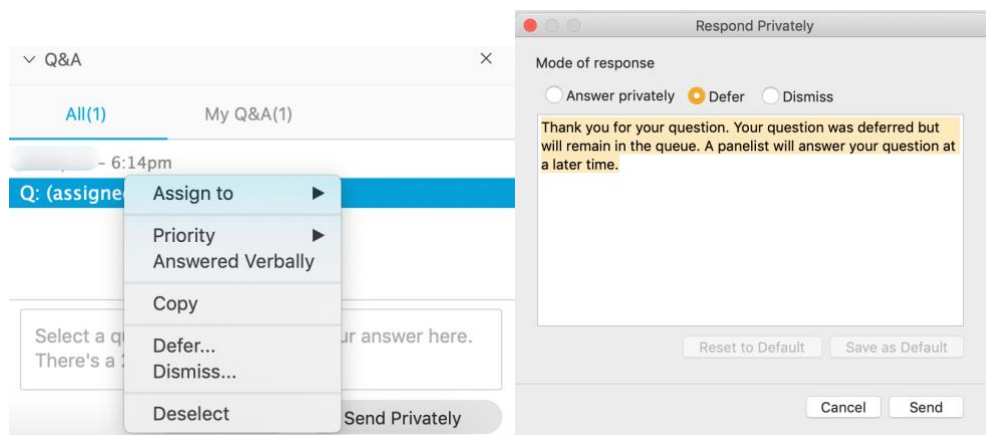


Session Chair Responsibility Q&A:

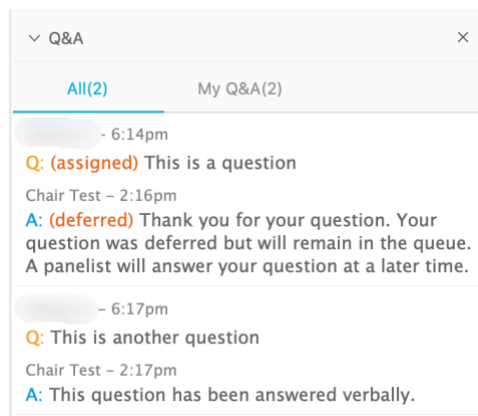
1. As organizers, we would like to ensure a smooth and productive virtual conference.
2. During the replay of presentation video, please keep track of the questions on the Q&A panel on the side-panel on the right of the WebEx window. If not shown, one can click on the icon shown below to enable the Q&A panel.



3. Please indicate a question to be answered by “deferring” it. This will generate an autoreply to the question submitter confirming the reception of the question.



4. After the video play back, **unmute yourself** and the **corresponding author/presenter only**. Please make sure to ask orally the questions and according to the FIFO time they were first submitted. If there are not many questions, feel free ask some of your own.
5. Sometimes the audience may need to clarify their question. In that case, it is upon the discretion of the Session Chair to unmute the attendee who placed the question to make clarifications.
6. **Please be mindful of the Q&A time limits!** We cannot introduce delays on the predetermined slots of each session, it will push other sessions behind.
7. After the presenter addressed a question, please indicate it is answered verbally.



8. Please collect the unanswered questions to the follow-up discussion board at Google Drive and copy them there.

Breaks:

Conferencing, online and in-person can be exhausting! We need to take breaks. We will take breaks. Breaks are built-in to the schedule!

- Stand up and stretch, get a snack, come back refreshed!
- If you leave WebEx on, make sure that your microphone is muted during the break

Keynotes

(all times EDT)

Keynote 1: 10:00-11:15, Monday, May 4, 2020



Standards and the Second Era of the Internet

Don Tapscott

Co-Founder and Executive Chairman, Blockchain Research Institute

Abstract: The Internet of Information is evolving into the Internet of value -- a new, distributed platform that can reshape business and fix the old order of human affairs for the better. This new internet, based on blockchain – the underlying technology behind crypto currencies, can transform financial services; change the deep structures of the corporation; animate the physical world; recast the role of government, and help solve the crisis of legitimacy of democracy.

New business models will disrupt most industries. This Second Era of the Digital Age has profound implications for strategy and leadership as through it, every business can finally become a digital business. It also created profound opportunities for public health – in particular in managing pandemics and preventing them in the future.

In 1994 Don Tapscott introduced The Digital Economy in his seminal book of that name and since has been the most prescient theorist of the ever-accelerating changes around us. In our opening keynote Don presents a frank State of the Union about this Second Era and why standards are so critical to its success.

Bio: Don Tapscott is the CEO of the Tapscott Group and the co-founder and Executive Chairman of the Blockchain Research Institute. The Blockchain Research Institute conducts studies on topics including the strategic implications of blockchain on business, government and society. He has authored or co-authored sixteen books on the application of technology in business and society. *Wikinomics: How Mass Collaboration Changes Everything* (2006), a book he co-authored, was number one on the 2007 management book charts and has been translated into 20 different languages. He is also co-author of the book *Blockchain Revolution* (2016, 2018) which is the seminal writing in blockchain technology. Don Tapscott holds a B.Sc. in psychology and statistics and an M.Ed. specializing in research methodology from the University of Alberta. He also holds honorary degrees of Doctor of Laws from the University of Alberta in 2001, Trent University in 2006, and McMaster University in 2010.

Keynote 2: 17:30-18:30, Monday, May 4, 2020**Economics of Libra**

Christian Catalini
Head Economist, Calibra (Facebook)

Abstract: The presentation will start with an overview of the economic design principles behind the Libra blockchain, as well as discuss new mechanisms for establishing trust in digital platforms. It will also provide an overview of the key economic updates contained in Libra's new white paper: 1) the introduction of single-currency stablecoins; 2) a redefined multi-currency \approx LBR based on fixed nominal weights; 3) more protections for the Libra Reserve under extreme market conditions, including a capital buffer; 4) a market-driven process that can replicate the key economic properties of permissionless systems, and give new entrants the ability to compete for the provision of core network services and participate in governance.

Bio: Christian Catalini is a co-creator of Libra and the head economist at Calibra (Facebook). He is also the Theodore T. Miller Career Development Professor at MIT, and Associate Professor of Technological Innovation, Entrepreneurship, and Strategic Management, MIT Sloan School of Management. Additionally, he is the founder of the MIT Cryptoeconomics Lab, a part of the MIT Initiative on the Digital Economy and a faculty advisor at the Digital Currency Initiative. He is a faculty research fellow at the National Bureau of Economic Research since 2018. His research focuses on blockchain technology and cryptocurrencies, the economics of equity crowdfunding and startup growth, and the economics of scientific collaboration. He holds a PhD from the University of Toronto (Rotman School of Management), and an MSc in Economics and Management of New Technologies from Bocconi University, Milan.

Keynote 3: 10:00-11:15, Tuesday, May 5, 2020**The Next 10 Years of Ethereum and Crypto**

Vitalik Buterin
Founder, Ethereum Foundation

Abstract: The Ethereum protocol has been advancing quickly in the last two years, with the launch of Ethereum 2.0 on the horizon. However, proof of stake and sharding are the beginning, and not the end. The next ten years are going to see massive further advances in zero knowledge proofs as well as other forms of cryptography, while at the same time existing use cases of blockchains reach maturity. The distance between "crypto as in cryptography" and "crypto as in cryptocurrency" will decrease, as blockchains, which provide security at the cost of privacy, and cryptography, which gives the privacy back, prove to be natural complements to each other, and the most powerful applications will be some combination of both.

Bio: Vitalik Buterin is the founder and inventor of Ethereum, the first decentralized network that facilitates the execution of Smart Contracts and Decentralized Applications (DApps). The native currency of Ethereum, known as ether or ETH, is currently the second-largest cryptocurrency by market cap. He is also a co-founder of Bitcoin Magazine and has been actively involved in the bitcoin community since 2011. He is an active participant in blockchain conferences and online discussions, regarding technical aspects but also the philosophical side of this emerging technology. Vitalik Buterin received an Honorary doctorate degree from the University of Basel, Switzerland in 2018.

**Keynote 4: 10:00-11:15, Monday, May 6, 2020**

To blockchain or not to blockchain? The Bank of Canada's journey into digital currency

Dinesh Shah
Director, Bank of Canada

Abstract: The Bank of Canada has undertaken a multi-phase experimental project, called Jasper, to critically examine the value proposition of distributed ledger technology in the financial system. Unlike most technologies blockchain is not value free: it attempts to organize the world with a different conception of trust. We describe our journey, collaboration with other central banks and financial institutions, our findings and outstanding questions.

Bio: Dinesh Shah is a director of Fintech research at the Bank of Canada. He leads a team that focuses on research on e-money and fintech. His research interest includes the analysis of emerging and potentially disruptive technologies with wide applications to financial market infrastructure and the financial system. He also drives the five phases of Project Jasper, which was the first project globally that involves a collaboration between a central bank and commercial banks to build a proof-of-concept interbank payment system with distributed ledgers. He joined the Bank of Canada in 2009 as an Enterprise Architect, then became a technical researcher focusing on research and analysis developments in e-money and payment systems and their impact on the Bank of Canada's mandate. He received an honored BSc degree from the University of Kent.

Industrial Panel



EDMUND MOY

Former Director of the United States Mint

Edmund C. Moy is an American businessman and former government official. From 2006 to 2011, he served as the 38th Director of the United States Mint.



VITALIK BUTERIN

Founder, Ethereum Foundation

Vitalik Buterin is the founder and inventor of Ethereum, the first decentralized network that facilitates the execution of Smart Contracts and Decentralized Applications (DApps).



ADDISON CAMERON-HUFF

Co-founder, Toronto Blockchain Week

Addison Cameron-Huff is one of Canada's leading cryptocurrency lawyers, having worked in the field since 2014. Mr. Cameron-Huff blogs, teaches and speaks on blockchain legal topics for his clients, for regulators, and to help build a pro-innovation environment in Canada. He was one of the first lawyers in Canada to accept Bitcoin and runs a niche practice serving several of Canada's most innovative cryptocurrency companies.



PERIANNE BORING

Founder, Chamber of Digital Commerce

Perianne Boring is an American businessperson and lobbyist for blockchains. She is president and founder of the Chamber of Digital Commerce, a blockchain trade association. In 2018, she was featured among "America's Top 50 Women In Tech" by Forbes.



ALEX TAPSCOTT (MODERATOR)

Co-Founder, Blockchain Research Institute

Alex Tapscott is a speaker, writer and seasoned venture capital investor focused on the impact of emerging technologies, such as blockchain and cryptocurrencies, on business, society and government. He is also a co-founder of the Blockchain Research Institute.

Technical Sessions (all times EDT)

Monday, May 4, 2020	
Technical Session 1 - 11:15 AM The Usual Suspects: Insights Into Bitcoin Chair: William Knottenbelt, Imperial College, UK	
TS01-1 11:15 AM	From Hodl to Heist: Analysis of Cyber Security Threats to Bitcoin Exchanges
	Kris Oosthoek, Christian Doerr
	<i>Delft University of Technology, The Netherlands</i>
TS01-2 11:40 AM	Liveliness and Consistency of Bitcoin and Prism Blockchains: The Non-lockstep Synchronous Case
	Jing Li, Dongning Guo
	<i>Northwestern University, USA</i>
TS01-3 12:05 PM	Characterizing Orphan Transactions in the Bitcoin Network
	Muhammad Anas Imtiaz, David Starobinski, Ari Trachtenberg
	<i>Boston University, USA</i>
Technical Session 2 - 1:30 PM The Matrix: Distributed Ledgers and Internet of Things Chair: Akaki Mamageishvili, ETH Zurich, Switzerland	
TS02-1 1:30 PM	Trust Management in Decentralized IoT Access Control System
	Guntur Putra ¹ , Volkan Dedeoglu ² , Salil S. Kanhere ¹ , Raja Jurdak ³
	¹ UNSW Sydney, Australia

	<p>2Data61 CSIRO, Australia</p> <p>3QUT, Australia</p>
<p>TS02-2</p> <p>1:55 PM</p>	<p>Monetization using Blockchains for IoT Data Marketplace</p> <p>Wiem Badreddine, Kaiwen Zhang, Chamseddine Talhi</p> <p><i>Université du Québec, Canada</i></p>
<p>TS02-3</p> <p>2:20 PM</p>	<p>Exploiting constrained IoT devices in a Trustless Blockchain-based Water Management System</p> <p>Miguel Pincheira¹, Massimo Vecchio¹, Raffaele Giaffreda¹, Salil S. Kanhere²</p> <p><i>¹Fondazione Bruno Kessler, Italy</i> <i>²UNSW Sydney, Australia</i></p>
<p>Technical Session 3 - 3:00 PM</p> <p>The Right Stuff: Smart Contracts and Verification</p> <p>Chair: Bhaskar Krishnamachari, University of Southern California, USA</p>	
<p>TS03-1</p> <p>3:00 PM</p>	<p>Optimal Smart Contracts with Costly Verification</p> <p>Akaki Mamagishvili¹, Jan Christoph Schlegel²</p> <p><i>¹ETH Zürich, Switzerland</i> <i>²City University of London, Great Britian</i></p>
<p>TS03-2</p> <p>3:25 PM</p>	<p>Smart Contract Protocol for Authenticity and Compliance with Anonymity on Hyperledger Fabric</p> <p>Rishi Saket, Nitin Singh, Pankaj Dayama, Vinayaka Pandit</p> <p><i>IBM Research India, India</i></p>
<p>TS03-3</p> <p>3:50 PM</p>	<p>Verified Development and Deployment of Multiple Interacting Smart Contracts with VeriSolid</p> <p>Keerthi Nelaturu¹, Anastasia Mavridou², Andreas Veneris¹, Aron Laszka³</p> <p><i>¹University of Toronto, Canada</i> <i>²NASA Ames, USA</i> <i>³University of Houston, USA</i></p>

Tuesday May 5, 2020

Technical Session 4 - 8:30 AM For Your Eyes Only: Privacy in Distributed Ledgers Chair: Ori Rottenstreich, Technion, Israel

TS04-1 8:30 AM	BPCEX: Towards Blockchain-based Privacy-preserving Currency Exchange
	Wulu Li, Lei Chen, Xin Lai, Xiao Zhang, Jiajun Xin
	<i>Onething Technologies Co., Ltd., China</i>
TS04-2 8:55 AM	Privacy-Preserving Claims Exchange Networks for Virtual Asset Service Providers
	Thomas Hardjono
	<i>Massachusetts Institute of Technology, USA</i>

Technical Session 5 - 11:15 AM Fast and Furious: Advances in Blockchain Scalability Chair: Mohsen Lesani, *University of California Riverside, USA*

TS05-1 11:15 AM	Scalable Block Execution via Parallel Validation
	Maya Leshkowitz ¹ , Olivia Benattasse ² , Oded Wertheim ² , Ori Rottenstreich ²
	<i>¹Hebrew University, Israel ²Technion, Israel</i>
TS05-2 11:40 AM	XOX Fabric
	Christian Gorenflo, Lukasz Golab, Srinivasan Keshav
	<i>University of Waterloo, Canada</i>
TS05-3 12:05 PM	State Sharding with Space-aware Representations
	Avi Mizrahi, Ori Rottenstreich

	<i>Technion, Israel</i>
Technical Session 6 - 1:30 PM Lost in Translation: Smart Contracts and Ledger Interoperability Chair: Lukasz Golab, University of Waterloo, Canada	
TS06-1	<i>Context-based Smart Contracts for Appendable-block Blockchains</i>
1:30 PM	<i>Henry Nunes¹, Roben Lunardi¹, Avelino Zorzo¹, Regio Michelin², Salil S. Kanhere²</i>
	<i>¹Pontifical Catholic University of Rio Grande do Sul, Brazil</i> <i>²UNSW Sydney, Australia</i>
TS06-2	<i>Domain Specific Language for Smart Contract Development</i>
1:55 PM	<i>Maximilian Woehrer, Uwe Zdun</i>
	<i>University of Vienna, Austria</i>
TS06-3	<i>Cross-Chain Transactions</i>
2:20 AM	<i>Narges Shadab, Farzin Houshmand, Mohsen Lesani</i>
	<i>University of California, Riverside, USA</i>

Wednesday May 6, 2020

Technical Session 7 - 11:15 AM

The Bourne Identity: Security and Privacy

Chair: Burkhard Stiller, University of Zurich, Switzerland

TS07-1 11:15 AM	A Data Science Approach for Detecting Honeypots in Ethereum
	Ramiro Camino, Christof Ferreira Torres, Mathis Steichen, Radu State
	<i>University of Luxembourg, Luxembourg</i>
TS07-2 11:40 AM	Tracing Cryptocurrency Scams: Clustering Replicated Advance-Fee and Phishing Websites
	Ross Phillips, Heidi Wilder
	<i>Elliptic, Great Britain</i>
TS07-3 12:05 PM	Privacy-Preserving Netting in Local Energy Grids
	Jacob Eberhardt, Marco Peise, Stefan Tai, Dong-Ha Kim
	<i>Technische Universität Berlin, Germany</i>

Technical Session 8 - 1:30 PM

Indecent Proposal: Identity, Data and Access Control

Chair: Wojciech Golab, University of Waterloo, Canada

TS08-1 1:30 PM	Decentralized Identity and Trust Management Framework for Internet of Things
	Markus Lücking ¹ , Christian Fries ¹ , Robin Lamberti ¹ , Wilhelm Stork ²
	¹ Forschungszentrum Informatik, Germany ² Karlsruher Institut für Technologie, Germany
TS08-2	Consentio: Managing Consent to Data Access using Permissioned Blockchains

1:55 PM	Rishav Agarwal, Dhruv Kumar, Lukasz Golab, Srinivasan Keshav <i>University of Waterloo, Canada</i>
TS08-3 2:20 PM	Put Your Money Where Your Mouth Is - Towards Blockchain-based Consent Violation Detection Jonathan Heiss, Jacob Eberhardt, Max Ulbricht <i>Technische Universität Berlin, Germany</i>
Technical Session 9 - 3:00 PM Robocop: System Applications and Performance Chair: Jacob Eberhardt, Technical University Berlin, Germany	
TS09-1 3:00 PM	<i>AWS: Blockchain-enabled Small-scale Farm Digitization</i> <i>Nelson Bore, Andrew Kinai, Penina Waweru, Isaac Wambugu, Juliet Mutahi, Everlyne Kemunto, Reginald Bryant, Komminist Weldemariam</i> <i>IBM Research Africa, Kenya</i>
TS09-2 3:25 PM	<i>A Controlled Natural Language to Support Intent-based Blockchain Selection</i> <i>Eder John Scheid, Patrick Widmer, Bruno Rodrigues, Muriel Franco, Burkhard Stiller</i> <i>University of Zürich, Switzerland</i>
TS09-3 3:50 PM	<i>Hyperledger Fabric Performance Characterization and Optimization Using GoLevelDB Benchmark</i> <i>Takuya Nakaike¹, Qi Zhang², Yohei Ueda¹, Tatsushi Inagaki¹, Moriyoshi Ohara¹</i> <i>¹IBM Research Tokyo, Japan ²IBM Research, USA</i>
Technical Session 10 - 4:30 PM Apollo 13: Technology Optimizations Chair: Grigore Rosu, University of Illinois Urbana-Champaign, USA	
	<i>Optimizing All-to-All Data Transmission in WANs</i>

TS10-1	<i>Hao Tan, Wojciech Golab</i>
4:30 PM	<i>University of Waterloo, Canada</i>
TS10-2	<i>Right-of-Stake: Deterministic and Fair Blockchain Leader Election with Hidden Leader</i>
4:55 PM	<i>Teik Guan Tan, Vishal Sharma, Jianying Zhou</i>
	<i>Singapore University of Technology and Design, Singapore</i>
TS10-3	<i>A Correlated Equilibrium based Transaction Pricing Mechanism in Blockchain</i>
5:20 PM	<i>Qin Hu, Yash Nigam¹, Zhilin Wang², Yawei Wang³, Yinhao Xiao⁴</i>
	<i>¹Nanchang University, China ²Indiana University-Purdue University Indianapolis, USA ³George Washington University, USA ⁴Guangdong University of Finance and Economics, China</i>

Short Paper Sessions (all times EDT)

Monday, May 4, 2020	
Short Paper Session 1 - 8:30 AM The Big Short: Security and Privacy Chair: James Won-Ki Hong, Postech, South Korea	
SS01-1 8:30 AM	Attribute-based Multi-Signature and Encryption for EHR Management: A Blockchain-based Solution <hr/> Hao Guo, Wanxin Li, Ehsan Meamari, Chien-Chung Shen, Mark Nejad <hr/> <i>University of Delaware, USA</i>
SS01-2 8:45 AM	Ransomware as a Service using Smart Contracts and IPFS <hr/> Christos Karapapas, Iakovos Pittaras, Nikos Fotiou, George Polyzos <hr/> <i>Athens University of Economics and Business, Greece</i>
SS01-3 9:00 AM	HushRelay: Privacy-Preserving Routing Algorithm for Off-Chain Payments <hr/> Subhra Mazumdar ¹ , Sushmita Ruj ² , Ram Govind Singh ¹ , Arindam Pal ² <hr/> <i>¹Indian Statistical Institute Kolkata, India</i> <i>²Data61 CSIRO, Australia</i>
SS01-4 9:15 AM	A Blockchain-based Decentralized Data Sharing Infrastructure for Off-grid Networking <hr/> Harris Niavis ¹ , Nikolaos Papadis ¹ , Venu Reddy ² , Hanumantha Rao Morusupalli ² , Leandros Tassiulas ¹ <hr/> <i>¹Yale University, USA</i> <i>²Tata Consultancy Services</i>
SS01-5 9:30 AM	Shellproof: More Efficient Zero-Knowledge Proofs for Confidential Transactions in Blockchain <hr/> Xianfeng Li, Chongjian Xu, Qinglin Zhao

	<i>Peking University Shenzhen Graduate School, China</i>
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Monday, May 4, 2020	
Short Paper Session 2 - 4:15 PM The Da Vinci Code: Smart Contracts and Applications Chair: Raja Jurdak, Queensland University of Technology, Australia	
SS02-1	From Legal Agreements to Blockchain Smart Contracts
4:15 PM	Ravi Rahman, Lalana Kagal
	<i>Massachusetts Institute of Technology, USA</i>
SS02-2	A Preliminary Study on Using Acceptance Tests for Representing Business Requirements of Smart Contracts
4:30 PM	Patricia Vilain ¹ , John Mylopoulos ²
	<i>¹Universidade Federal de Santa Catarina, Brazil</i> <i>²University of Toronto, Canada</i>
SS02-3	Building Hybrid DApps using Blockchain Tactics? The Meta-Transaction Example
4:45 PM	Florian Blum, Benedikt Severin, Michael Hettmer, Philipp Hückinghaus, Volker Gruhn
	<i>University of Duisburg-Essen, Germany</i>
SS02-4	A Cost-efficient IoT Forensics Framework with Blockchain
5:00 PM	Suat Mercan, Mumin Cebe, Ege Tekiner, Kemal Akkaya, Melissa Chang, Selcuk Uluagac
	<i>Florida International University, USA</i>

Wednesday, May 6, 2020

Short Paper Session 3 - 8:30 AM

Get Smart: Algorithms and Optimizations

Chair: Yacov Manevich, *IBM Research, Israel*

SS03-1 8:30 AM	Imbalance measure and proactive channel rebalancing algorithm for the Lightning Network
	Rene Pickhardt, Mariusz Nowostawski
	<i>Norwegian University of Science and Technology, Norway</i>
SS03-2 8:45 AM	Parallel Hash-Mark-Set on the Ethereum Blockchain
	Zachary Painter, Pradeep Kumar Gayam, Victor Cook, Damian Dechev
	<i>University of Central Florida, USA</i>
SS03-3 9:00 AM	Hardening Permissioned Blockchains with Verifiable Randomness
	Hagar Meir, Artem Barger, Yacov Manevich
	<i>IBM Haifa Research Lab, Israel</i>
SS03-4 9:15 AM	Criticality Aware Orderer for Heterogeneous Transactions in Blockchain
	Umang Goel, Rahul Sonanis, Ishan Rastogi, Siddharth Lal, Aloknath De
	<i>Samsung Research Institute, Bangalore, India</i>

SS03-5	Analysing the Success of Selfish Mining with Multiple Players
9:30 AM	Shiquan Zhang ¹ , Kaiwen Zhang ² , Bettina Kemme ¹
	<i>¹McGill University, Canada</i> <i>²École de technologie supérieure, Université du Québec, Canada</i>

Tutorials (all times EDT)

Sunday, May 3, 2020	
Tutorial Session 1 - 9:00 AM Tutorial 1 Chair: Guilherme Sperb Machado, AxLabs, Switzerland Tutorial 5 Chair: Ioannis Psaras, Protocol Labs, Portugal	
Tutorial 1	On the Privacy of Transactions in Account-Based Cryptocurrencies
	Mikerah Quintyne-Collins
	<i>HashCloak Inc., Canada</i>
Tutorial 5	Building Your Own Blockchain in Under Two Hours with Substrate
	Bruno Skvorc
	<i>Web3 Foundation, Croatia</i>

Tutorial Session 2 - 11:30 AM

Tutorial 6 Chair: Guilherme Sperb Machado, AxLabs, Switzerland

Tutorial 2 Chair: Ioannis Psaras, Protocol Labs, Portugal

Tutorial 6	Deep Dive Into Interledger: Understanding the Interledger Ecosystem
	Lucian Trestioreanu, Cyril Cassagnes, Radu State
	<i>University of Luxembourg, Luxembourg</i>
Tutorial 2	Practical Introduction to Blockchain-Based Remote Electronic Voting
	Christian Killer, Bruno Rodrigues, Eder John Scheid, Muriel Franco, Burkhard Stiller
	<i>University of Zürich, Switzerland</i>

Sunday, May 3, 2020

Tutorial Session 3 - 2:30 PM

Tutorial 3 Chair: Bruno Skvorc, *Web3 Foundation, Croatia*

Tutorial 7 Chair: Mikerah Quintyne-Collins, *HashCloak Inc., Canada*

Tutorial 3	The InterPlanetary File System and the Filecoin network
	Ioannis Psaras, David Dias
	<i>Protocol Labs, Portugal</i>
Tutorial 7	Real-world Formal Verification of Smart Contracts using the K Framework (Sponsored)
	Everett Hildenbrandt, Daejun Park, Yi Zhang, Grigore Roşu
	<i>Runtime Verification</i>

Tutorial Session 4 - 5:00 PM

Tutorial 4 Chair: Bruno Skvorc, *Web3 Foundation, Croatia*

Tutorial 8 Chair: Mikerah Quintyne-Collins, *HashCloak Inc., Canada*

Tutorial 4	Neo Blockchain: Developing dApps without Learning a New Programming Language
	Guilherme Sperb Machado, Claude Müller
	<i>AxLabs, Switzerland</i>
Tutorial 8	Building with Algorand 2.0: Everything you need to know
	Russ Fustino
	<i>Algorand</i>

Posters and Demos - Saturday, May 2, 2020 (all times EDT)

Poster/Demo Session 1A - 10:00 AM	
Chair: Qinghua Lu, <i>Data61 of CSIRO, Australia</i>	
10:00 AM	Verification of Customizable Blockchain Consensus Rule for Assurance of Fault Tolerance in a Network of Distrusting Organizations
	Ryo Kawahara
	<i>IBM Research, Tokyo</i>
10:15 AM	A Time Bank System Design on the Basis of Hyperledger Fabric Framework
	Yu-Tse Lee, Jhan-Jia Lin, Jane Yung-Jen Hsu, Ja-Ling Wu
	<i>National Taiwan University, Taiwan</i>
10:30 AM	Crypto Terminal: A New Open Device For Securing Blockchain Wallets
	Pascal Urien
	<i>Telecom ParisTech, France</i>
10:45 AM	TRUSTD: Combat Fake Content using Blockchain and Collective Signature Technologies
	Zakwan Jaroucheh, Mohammad Alissa, William J Buchanan
	<i>Edinburgh Napier University, Great Britain</i>
11:00 AM	Incorruptible Auditing: Blockchain-Powered Graph Database Management
	Victor Ermolaev ¹ , Indrek Klangberg ² , Yash Madhwal ³ , Silver Vapper ² , Sjoerd Wels ² , Yury Yanovich ¹
	¹ <i>Bitfury, The Netherlands</i>
	² <i>University of Twente, The Netherlands</i> ³ <i>Skoltech, Russia</i>
11:15 AM	SkillCheck: An Incentive-based Certification System using Blockchains
	Swaprava Nath, Jay Gupta
	<i>IIT Kanpur, India</i>
11:30 AM	Vote Delegation and Malicious Parties
	Hans Gersbach, Akaki Mamageishvili, Manvir Schneider
	<i>ETH Zurich, Switzerland</i>

11:45 AM	Evaluation of Security and Performance of Master Node Protocol in the Bitcoin Peer-to-Peer Network
	Muntadher Fadhil Sallal
	<i>Nottingham Trent University, Great Britain</i>

Poster/Demo Session 1B - 10:00 AM

Chair: Yuxi Cai, *University of Toronto, Canada*

10:00 AM	Profiling of Malicious Users Using Simple Honey pots on the Ethereum Blockchain Network
	Kazuki Hara, Teppei Sato, Mitsuyoshi Imamura, Kazumasa Omote
	<i>University of Tsukuba, Japan</i>
10:15 AM	Reasonableness Discussion and Analysis for Hyperledger Fabric Configuration
	Song Hua ¹ , Shenbin Zhang ¹ , Bingfeng Pi ¹ , Jun Sun ¹ , Kazuhiro Yamashita ² , Yoshihide Nomura ²
	<i>¹Fujitsu Research, China</i> <i>²Fujitsu Research, Japan</i>
10:30 AM	Democratization of Smart Contracts: A Prototype for Automated Contract Generation
	Felix Franz, Tobias Fertig, Andreas E Schutz
	<i>University of Applied Sciences Wurzburg-schweinfurt, Germany</i>
10:45 AM	SC-Flare: Cooperative DDoS Signaling based on Smart Contracts
	Bruno Rodrigues, Spasen Trendafilov, Eder John Scheid, Burkhard Stiller
	<i>University of Zurich, Switzerland</i>
11:00 AM	Wallet Contracts on Ethereum
	Monika Di Angelo, Gernot Salzer
	<i>TU Wien, Austria</i>
11:15 AM	Rational Exchange: Incentives in Atomic Cross Chain Swaps
	Janick Rueegger ¹ , Guilherme Sperb Machado ^{2,3}
	<i>¹Swisscom, Switzerland</i> <i>²SIBEX, Switzerland</i>

	<i>3AxLabs, Switzerland</i>
11:30 AM	Mining Blocks in a Row: A Statistical Study of Fairness in Bitcoin Mining
	Shengnan Li, Zhao Yang, Claudio Tessone
	<i>University of Zurich, Switzerland</i>

Poster/Demo Session 2A - 1:00 PM

Chair: Anastasia Mavridou, *KBR / NASA Ames Research Center, USA*

1:00 PM	On the Fairness of Distributed Ledger Technologies for the Internet of Things
	Luigi Vigneri, Wolfgang Welz
	<i>IOTA Foundation, Germany</i>
1:15 PM	Gamified Service Exchange Platform on Blockchain for IoT Business Agility
	Shahin Gheitanchi
	<i>IEEE, Great Britain</i>
1:30 PM	EcoBoost: Efficient Bootstrapping for Confidential Transactions
	Chenggang Wang ¹ , Boyang Wang ¹ , Xinxin Fan ²
	<i>¹University of Cincinnati, USA ²Hyperconnect Lab Inc, USA</i>
1:45 PM	Balance Transfers and Bailouts in Credit Networks using Blockchains
	Roopa Vishwanathan, Kartick Kolachala, Lalitha Muthu Subramanian
	<i>New Mexico State University, USA</i>
2:00 PM	Distributed Consensus for Mobile Devices using Online Brokers
	Mehrdad Kiamari, Bhaskar Krishnamachari, Muhammad Naveed, Seokgu Yun
	<i>University of Southern California, USA</i>
2:15 PM	A Blockchain-Based Privacy-Preserving Intelligent Charging Station Selection for Electric Vehicles
	Syed Muhammad Danish ¹ , Kaiwen Zhang ¹ , Hans-Arno Jacobsen ²
	<i>¹Ecole de Technologie Supérieure ETS, Canada ²University of Toronto, Canada</i>
2:30 PM	Determining Optimal Shard Size in a Hierarchical Blockchain Architecture

	Shyam Kantesariya, Dhrubajyoti Goswami <i>Concordia University, Canada</i>
2:45 PM	Architecting Configurable Blockchain Network Simulators: A Model-driven Perspective Sotirios Liaskos, Tarun Anand, Nahid Alimohammadi <i>York University, Canada</i>

Poster/Demo Session 2B - 1:00 PM

Chair: Zissis Poulos, *University of Toronto Canada*

1:00 PM	A Containerized Proof-of-Concept Implementation of LightChain system Yahya Hassanzadeh-Nazarabadi ¹ , Nazir Nayal ² , Shadi Sameh Hamdan ² , Oznur Ozkasap ² , Alptekin Küpçü <i>¹DapperLabs</i> <i>²Koç University</i>
1:15 PM	SkipSim: Scalable Skip Graph Simulator Yahya Hassanzadeh-Nazarabadi ¹ , Ali Utkan Sahin ² , Oznur Ozkasap ² , Alptekin Küpçü ² <i>¹DapperLabs</i> <i>²Koç University, Turkey</i>
1:30 PM	From Curved Bonding to Configuration Spaces Michael Zargham, Krzysztof Paruch, Jamsheed Shorish <i>Vienna University of Economics and Business, Austria</i>
1:45 PM	Towards Usable Protection Against Honeypots Christof Ferreira Torres ¹ , Mathis Baden ² , Radu State ² <i>¹University of Luxembourg, Luxembourg</i> <i>²Telindus, Belgium</i>
2:00 PM	Discover DaVinci A Gamified Blockchain Trivia App Marko Suvajdzic, James Oliverio, Angelos Barmpoutis, Liam Wood, Paul Burgermeister <i>University of Florida, Digital Worlds Institute, USA</i>

2:15 PM	Distributed Fractionalized Data Networks for Data Integrity
	Arun Majumdar, Govind Mohan <i>Virgil Systems, Canada</i>
2:30 PM	Customer Data Sharing Platform: A Blockchain Based Shopping Cart
	Ajay Shrestha <i>University of Saskatchewan, Canada</i>
2:45 PM	Improving Transaction Success Rate via Smart Gateway Selection in Cryptocurrency Payment Channel Networks
	Suat Mercan, Enes Erdin, Kemal Akkaya <i>Florida International University, USA</i>

Poster/Demo Session 3A - 4:00 PM

Chair: Christof Ferreira Torres, *University of Luxembourg, Luxembourg*

4:00 PM	Formalizing Correct-by-Construction Casper in Coq
	Elaine Li ¹ , Traian Serbanuta ² , Denisa Diaconescu ² , Grigore Rosu ³
	¹ <i>Runtime Verification, USA</i> ² <i>Runtime Verification, Romania</i> ³ <i>University of Illinois Urbana Champaign, USA</i>
4:15 PM	Energy Consumption Analysis of XRP Validator
	Crystal A Roma, M Anwar Hasan <i>University of Waterloo, Canada</i>
4:30 PM	A Relational Network Framework for Interoperability in Distributed Energy Trading
	Samuel Maina Karumba ¹ , Salil S. Kanhare ¹ , Raja Jurdak ² ¹ <i>UNSW, Australia</i> ² <i>QUT, Australia</i>
4:45 PM	PLEDGE: A Proof-of-Honesty based Consensus Protocol for Blockchain-based IoT Systems
	Imran Makhdoom <i>University of Technology Sydney, Australia</i>

Poster/Demo Session 3B - 4:00 PM

Chair: Sotirios Liaskos, York University, Canada

4:00 PM	Performance and Fault Tolerance Tradeoffs in Sharded Permissioned Blockchains
	Chunyu Mao, Anh Duong Nguyen, Wojciech Golab
	<i>University of Waterloo, Canada</i>
4:15 PM	FabricUnit: A Framework for Faster Execution of Unit Tests on Hyperledger Fabric
	Shashank Motepalli ¹ , Patricia Vilain ² , Arno Jacobsen ¹
	<i>¹University of Toronto, Canada ²Universidade Federal de Santa Catarina, Brazil</i>
4:30 PM	Software Architecture for Blockchain-based Trade Certificate Systems
	Qinghua Lu ¹ , Mark Staples ¹ , Hugo O'Connor ¹ , Shiping Chen ² , Adnene Guabtni ¹
	<i>¹CSIRO, Australia ²CSIRO Data61, Australia</i>
4:45 PM	Leveraging Lightweight Blockchain to Establish Data Integrity for Surveillance Cameras
	Regio Michelin, Nadeem Ahmed, Salil S. Kanhare, A Seneviratne, Sanjay Jha
	<i>UNSW, Australia</i>

Poster/Demo Session 4A - 10:00 AM

Chair: Anastasia Mavridou, KBR / NASA Ames Research Center, USA

10:00 AM	On the Fairness of Distributed Ledger Technologies for the Internet of Things
	Luigi Vigneri, Wolfgang Welz
	<i>IOTA Foundation, Germany</i>
10:15 AM	Gamified Service Exchange Platform on Blockchain for IoT Business Agility
	Shahin Gheitanchi
	<i>IEEE, Great Britain</i>
10:30 AM	EcoBoost: Efficient Bootstrapping for Confidential Transactions
	Chenggang Wang ¹ , Boyang Wang ¹ , Xinxin Fan ²

	<i>1University of Cincinnati, USA</i> <i>2Hyperconnect Lab Inc, USA</i>
10:45 AM	Balance Transfers and Bailouts in Credit Networks using Blockchains
	Roopa Vishwanathan, Kartick Kolachala, Lalitha Muthu Subramanian
	<i>New Mexico State University, USA</i>
11:00 AM	Distributed Consensus for Mobile Devices using Online Brokers
	Mehrdad Kiamari, Bhaskar Krishnamachari, Muhammad Naveed, Seokgu Yun
	<i>University of Southern California, USA</i>
11:15 AM	A Blockchain-Based Privacy-Preserving Intelligent Charging Station Selection for Electric Vehicles
	Syed Muhammad Danish ¹ , Kaiwen Zhang ¹ , Hans-Arno Jacobsen ²
	<i>1Ecole de Technologie Supérieure ETS, Canada</i> <i>2University of Toronto, Canada</i>
11:30 AM	Determining Optimal Shard Size in a Hierarchical Blockchain Architecture
	Shyam Kantesariya, Dhruvajyoti Goswami
	<i>Concordia University, Canada</i>
11:45 AM	Architecting Configurable Blockchain Network Simulators: A Model-driven Perspective
	Sotirios Liaskos, Tarun Anand, Nahid Alimohammadi
	<i>York University, Canada</i>

Poster/Demo Session 4B - 10:00 AM

Chair: Zissis Poulos, *University of Toronto, Canada*

10:00 AM	Democratization of Smart Contracts: A Prototype for Automated Contract Generation
	Felix Franz, Tobias Fertig, Andreas E Schutz
	<i>University of Applied Sciences Würzburg-schweinfurt, Germany</i>
10:15 AM	A Containerized Proof-of-Concept Implementation of LightChain system
	Yahya Hassanzadeh-Nazarabadi ¹ , Nazir Nayal ² , Shadi Sameh Hamdan ² , Ozgur Ozkasap ² , Alptekin Küpçü ²

	<p><i>1DapperLabs</i> <i>2Koç University</i></p>
10:30 AM	<p>SkipSim: Scalable Skip Graph Simulator</p>
	<p>Yahya Hassanzadeh-Nazarabadi¹, Ali Utkan Sahin², Ozgur Ozkasap², Alptekin Küpçü²</p>
	<p><i>1DapperLabs</i> <i>2Koç University</i></p>
10:45 AM	<p>From Curved Bonding to Configuration Spaces</p>
	<p>Michael Zargham, Krzysztof Paruch, Jamsheed Shorish</p>
	<p><i>Vienna University of Economics and Business</i></p>
11:00 AM	<p>Towards Usable Protection Against Honeypots</p>
	<p>Christof Ferreira Torres¹, Mathis Baden², Radu State¹</p>
	<p><i>1University of Luxembourg, Luxembourg</i> <i>2Telindus, Belgium</i></p>
11:15 AM	<p>Discover DaVinci A Gamified Blockchain Trivia App</p>
	<p>Marko Suvajdzic, James Oliverio, Angelos Barmpoutis, Liam Wood, Paul Burgermeister</p>
	<p><i>University of Florida, Digital Worlds Institute, USA</i></p>
11:30 AM	<p>Distributed Fractionalized Data Networks for Data Integrity</p>
	<p>Arun Majumdar, Govind Mohan</p>
	<p><i>Virgil Systems, Canada</i></p>
11:45 AM	<p>Customer Data Sharing Platform: A Blockchain Based Shopping Cart</p>
	<p>Ajay Shrestha</p>
	<p><i>University of Saskatchewan</i></p>

Poster/Demo Session 5A - 1:00 PM

Chair: Nicholas Fung, University of Toronto, Canada

1:00 PM	<p>Crypto Terminal: A New Open Device For Securing Blockchain Wallets</p>
	<p>Pascal Urien</p>
	<p><i>Telecom ParisTech, France</i></p>

1:15 PM	TRUSTD: Combat Fake Content using Blockchain and Collective Signature Technologies
	Zakwan Jaroucheh, Mohammad Alissa, William J Buchanan
	<i>Edinburgh Napier University, Great Britain</i>
1:30 PM	Incorruptible Auditing: Blockchain-Powered Graph Database Management
	Victor Ermolaev ¹ , Indrek Klangberg ² , Yash Madhwal ³ , Silver Vapper ² , Sjoerd Wels ² , Yury Yanovich ¹
	<i>1Bitfury, The Netherlands 2University of Twente, The Netherlands 3Skoltech, Russia</i>
1:45 PM	SkillCheck: An Incentive-based Certification System using Blockchains
	Swaprava Nath, Jay Gupta
	<i>IIT Kanpur, India</i>
2:00 PM	Vote Delegation and Malicious Parties
	Hans Gersbach, Akaki Mamageishvili, Manvir Schneider
	<i>ETH Zurich, Switzerland</i>
2:15 PM	Evaluation of Security and Performance of Master Node Protocol in the Bitcoin Peer-to-Peer Network
	Muntadher Fadhil Sallal
	<i>Nottingham Trent University, Great Britain</i>
2:30 PM	Formalizing Correct-by-Construction Casper in Coq
	Elaine Li ¹ , Traian Serbanuta ² , Denisa Diaconescu ² , Grigore Rosu ³
	<i>1Runtime Verification, USA 2Runtime Verification, Romania 3University of Illinois Urbana Champaign, USA</i>
2:45 PM	Energy Consumption Analysis of XRP Validator
	Crystal A Roma, M Anwar Hasan
	<i>University of Waterloo, Canada</i>

Poster/Demo Session 5B - 1:00 PM

Chair: Keerthi Nelaturu, University of Toronto, Canada

1:00 PM	Improving Transaction Success Rate via Smart Gateway Selection in Cryptocurrency Payment Channel Networks
	Suat Mercan, Enes Erdin, Kemal Akkaya
	<i>Florida International University, USA</i>
1:15 PM	SC-Flare: Cooperative DDoS Signaling based on Smart Contracts
	Bruno Rodrigues, Spasen Trendafilov, Eder John Scheid, Burkhard Stiller
	<i>University of Zurich, Switzerland</i>
1:30 PM	Wallet Contracts on Ethereum
	Monika Di Angelo, Gernot Salzer
	<i>TU Wien, Austria</i>
1:45 PM	Rational Exchange: Incentives in Atomic Cross Chain Swaps
	Janick Rueegger ¹ , Guilherme Sperb Machado ^{2,3}
	<i>1Swisscom, Switzerland</i>
	<i>2SIBEX, Switzerland</i> <i>3AxLabs, Switzerland</i>
2:00 PM	Mining Blocks in a Row: A Statistical Study of Fairness in Bitcoin Mining
	Shengnan Li, Zhao Yang, Claudio Tessone
	<i>University of Zurich, Switzerland</i>
2:15 PM	Performance and Fault Tolerance Tradeoffs in Sharded Permissioned Blockchains
	Chunyu Mao, Anh Duong Nguyen, Wojciech Golab
	<i>University of Waterloo, Canada</i>
2:30 PM	FabricUnit: A Framework for Faster Execution of Unit Tests on Hyperledger Fabric
	Shashank Motepalli ¹ , Patricia Vilain ² , Arno Jacobsen ¹
	<i>1University of Toronto, Canada</i> <i>2Universidade Federal de Santa Catarina, Brazil</i>

Poster/Demo Session 6A - 9:00 PM

Chair: Aron Laszka, *University of Houston, USA*

9:00 PM	A Relational Network Framework for Interoperability in Distributed Energy Trading
	Samuel Maina Karumba, Salil S. Kanhare, Raja Jurdak
	<i>1UNSW, Australia 2QUT, Australia</i>
9:15 PM	PLEDGE: A Proof-of-Honesty based Consensus Protocol for Blockchain-based IoT Systems
	Imran Makhdoom
	<i>University of Technology Sydney, Australia</i>
9:30 PM	Verification of Customizable Blockchain Consensus Rule for Assurance of Fault Tolerance in a Network of Distrusting Organizations
	Ryo Kawahara
	<i>IBM Research, Tokyo</i>
9:45 PM	A Time Bank System Design on the Basis of Hyperledger Fabric Framework
	Yu-Tse Lee, Jhan-Jia Lin, Jane Yung-Jen Hsu, Ja-Ling Wu
	<i>National Taiwan University, Taiwan</i>

Poster/Demo Session 6B - 9:00 PM

Chair: Sotirios Liaskos, *York University, Canada*

9:00 PM	Software Architecture for Blockchain-based Trade Certificate Systems
	Qinghua Lu ¹ , Mark Staples ¹ , Hugo O'Connor ¹ , Shiping Chen ² , Adhene Guabtni ¹
	<i>1CSIRO, Australia 2CSIRO Data61, Australia</i>
9:15 PM	Leveraging Lightweight Blockchain to Establish Data Integrity for Surveillance Cameras
	Regio Michelin, Nadeem Ahmed, Salil S. Kanhare, A Seneviratne, Sanjay Jha
	<i>UNSW, Australia</i>
9:30 PM	Profiling of Malicious Users Using Simple Honeypots on the Ethereum Blockchain Network
	Kazuki Hara, Teppei Sato, Mitsuyoshi Imamura, Kazumasa Omote

	<i>University of Tsukuba, Japan</i>
9:45 PM	Reasonableness Discussion and Analysis for Hyperledger Fabric Configuration
	Song Hua ¹ , Shenbin Zhang ¹ , Bingfeng Pi ¹ , Jun Sun ¹ , Kazuhiro Yamashita ² , Yoshihide Nomura ²
	¹ <i>Fujitsu Research, China</i> ² <i>Fujitsu Research, Japan</i>