IEEE International Conference on Blockchain and Cryptocurrency

Final Program

2-6 May 2020

Patrons

Contents

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 Veritification
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	
11:00 AM - 11:30 AM	Exhibition: Palliums/Violas	First block of presentations (10:00 AM - 11:30 AM)
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

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<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>2:45 PM - 3:00 PM</td><td colspan="3">Break</td></tr>
<tr><td>3:00 PM - 4:15 PM</td><td>Technical Session 3</td><td rowspan="2">Industrial Panel
Moderator: Alex Tapscott (BRI)
• Edmund Moy (United States Mint),
• Vitalik Buterin (Ethereum),
• Addison Cameron-Huff (Toronto Blockchain Week),
• Perianne Boring (Chamber of Digital Commerce)</td><td>Technical Session 9</td></tr>
<tr><td>4:15 PM - 4:30 PM</td><td rowspan="4">Short Papers Session 2</td><td>Break</td></tr>
<tr><td>4:30 PM - 4:45 PM</td><td></td><td rowspan="4">Technical Session 10</td></tr>
<tr><td>5:00 PM - 5:15 PM</td><td></td></tr>
<tr><td>5:15 PM - 5:30 PM</td><td>Break</td><td></td></tr>
<tr><td>5:30 PM - 5:45 PM</td><td rowspan="3">Keynote 2
Christian Catalini, Libra/Calibra/MIT</td><td></td></tr>
<tr><td>5:45 PM - 6:00 PM</td><td></td><td rowspan="2">Closing Acknowledgments, Best Paper Awards and ICBC 2021 presentation</td></tr>
<tr><td>6:00 PM - 6:15 PM</td><td></td></tr>
<tr><td>6:15 PM - 6:30 PM</td><td></td><td></td></tr>
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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.

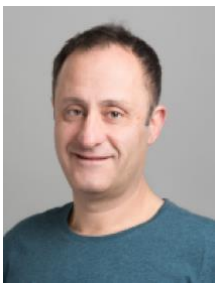
Another aspect that cannot be neglected is the fact that this year ICBC2020 received 203 submissions (full/short-papers, demo and posters) from 36 countries. This represents approximately a 35% increase of submissions from last year. Of these submissions 32% were from North America, 31% from Asia, 28% 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!

Kostas Plataniotis
General Chair



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Sara Rouhani - University of Saskatchewan
Sergey Gorbunov - University of Waterloo
Seung-Joon Seok - Kyungnam University
Sherali Zeadally - University of Kentucky
Shingo Ata - Osaka City University
Shiping Chen - CSIRO Data61
Shlomi Dolev - Ben-Gurion University
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Suzana Moreno - BNDES
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Volkan Dedeoglu - CSIRO
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Wazen Shbair - University of Luxembourg
Weizhi Meng - Technical University of Denmark
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 Pratice

Instruction for Attendees

Initial WebEx setup:

Please install WebEx extension to your browser in advance.

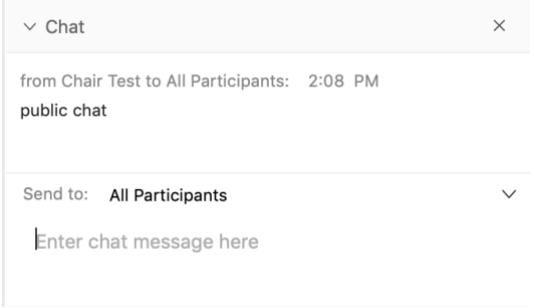
Note: It is recommended to install a browser extension as WebEx events are supported better on an extension. We also note that the extension only works on some versions in Linux System.

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”.

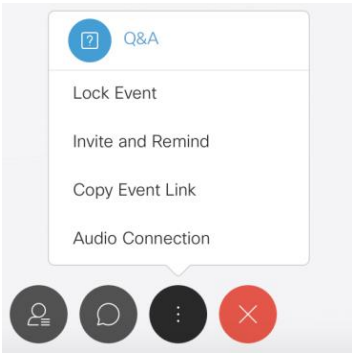


3. You are welcome to use private chat to direct questions to the Session Chair (NAME: Chair *).
4. When watching the replay of the presentation video, you can adjust the volume of the video/enlarge the view using the embedded player. To get the maximum view of the video, we suggest attendees to expand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

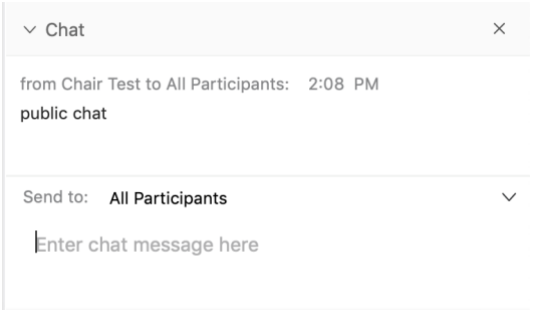
How to join the Session:

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”.

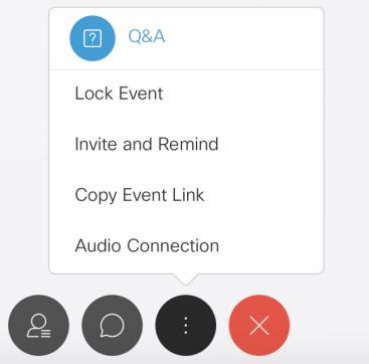


2. You are welcome to use private chat to direct questions to the Session Chair (NAME:

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.
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.

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.

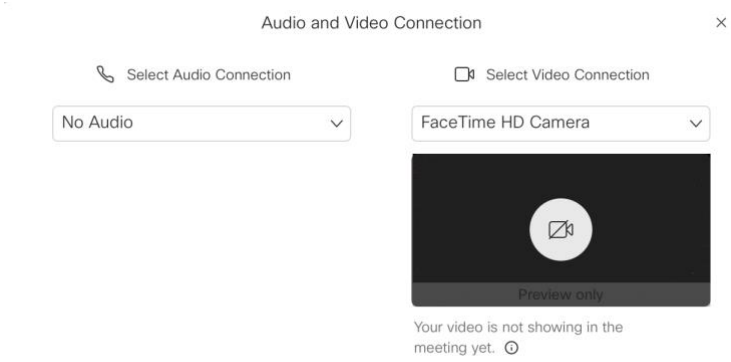
How to join a session:

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.

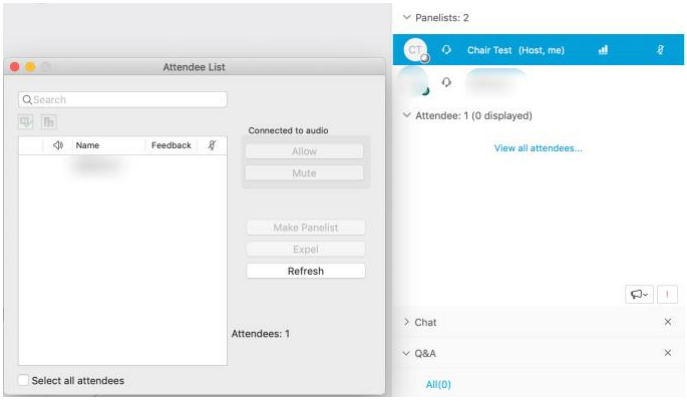
3. If you are joining the session before the host has started the meeting, please wait in the lobby until the host starts the session.

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.

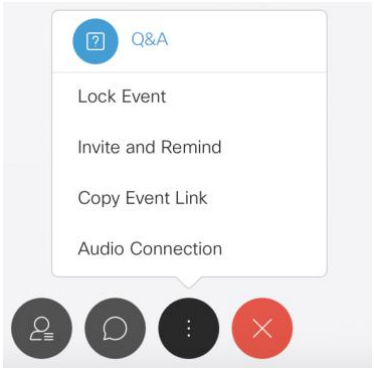


3. After introducing the session and the first presenter, we recommend you turn off the video so that the attendees can focus on the talk video.
4. You can manage the attendee by clicking on the “View all attendees” link under the Attendee panel.

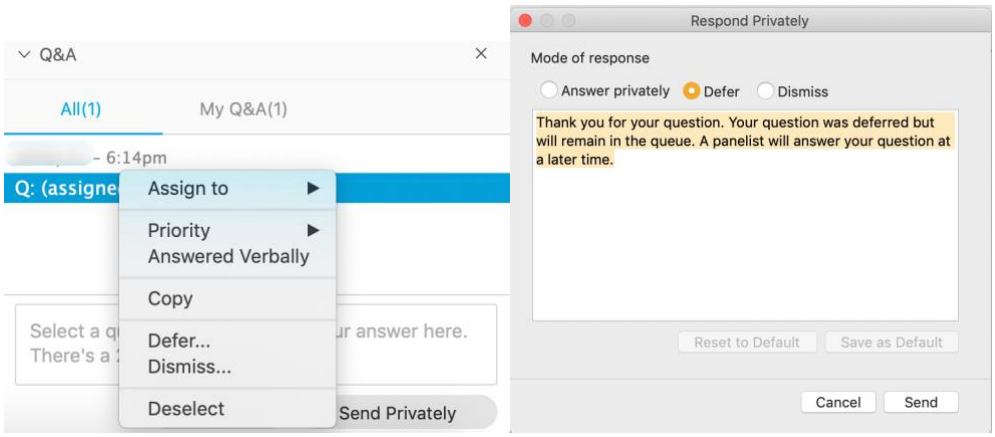


Session Chair Responsibility Q&A:

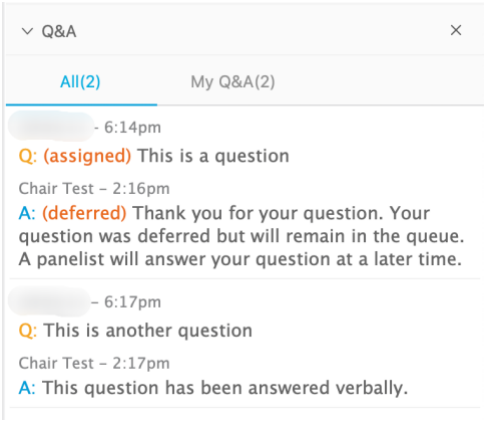
1. As organizers, we would like to ensure a smooth and productive virtual conference.
2. During the replay of presentation video, please keep track of the questions on the Q&A panel on the side-panel on the right of the WebEx window. If not shown, one can click on the icon shown below to enable the Q&A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

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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 ≋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

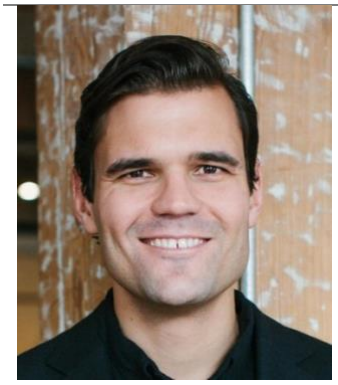
Co-founder, Toronto Blockchain Week

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
	Delft University of Technology, The Netherlands
TS01-2 **11:40 AM**	**Liveliness and Consistency of Bitcoin and Prism Blockchains: The Non-lockstep Synchronous Case**
	Jing Li, Dongning Guo
	Northwestern University, USA
TS01-3 **12:05 PM**	**Characterizing Orphan Transactions in the Bitcoin Network**
	Muhammad Anas Imtiaz, David Starobinski, Ari Trachtenberg
	Boston University, USA

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

	2Data61 CSIRO, Australia 3QUT, Australia
TS02-2 **1:55 PM**	**Monetization using Blockchains for IoT Data Marketplace**
	Wiem Badreddine, Kaiwen Zhang, Chamseddine Talhi
	Université du Québec, Canada
TS02-3 2:20 PM	***Exploiting constrained IoT devices in a Trustless Blockchain-based Water Management System***
	Miguel Pincheira1, Massimo Vecchio1, Raffaele Giaffreda1, Salil S. Kanhere2
	1Fondazione Bruno Kessler, Italy *2UNSW Sydney, Australia*
Technical Session 3 - 3:00 PM **The Right Stuff: Smart Contracts and Verification** **Chair: Bhaskar Krishnamachari, *University of Southern California, USA***	
TS03-1 3:00 PM	***Optimal Smart Contracts with Costly Verification***
	Akaki Mamageishvili1, Jan Christoph Schlegl2
	1ETH Zürich, Switzerland *2City University of London, Great Britian*
TS03-2 3:25 PM	***Smart Contract Protocol for Authenticity and Compliance with Anonymity on Hyperledger Fabric***
	Rishi Saket, Nitin Singh, Pankaj Dayama, Vinayaka Pandit
	IBM Research India, India
TS03-3 3:50 PM	***Verified Development and Deployment of Multiple Interacting Smart Contracts with VeriSolid***
	Keerthi Nelaturu1, Anastasia Mavridou2, Andreas Veneris1, Aron Laszka3
	1University of Toronto, Canada *2NASA Ames, USA* *3University of Houston, USA*

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
	Onething Technologies Co., Ltd., China
TS04-2 **8:55 AM**	**Privacy-Preserving Claims Exchange Networks for Virtual Asset Service Providers**
	Thomas Hardjono
	Massachusetts Institute of Technology, USA

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]
	[1]*Hebrew University, Israel* [2]*Technion, Israel*
TS05-2 11:40 AM	**XOX Fabric**
	Christian Gorenflo, Lukasz Golab, Srinivasan Keshav
	University of Waterloo, Canada
TS05-3 12:05 PM	**State Sharding with Space-aware Representations**
	Avi Mizrahi, Ori Rottenstreich

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

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
	University of Luxembourg, Luxembourg
TS07-2 **11:40 AM**	**Tracing Cryptocurrency Scams: Clustering Replicated Advance-Fee and Phishing Websites**
	Ross Phillips, Heidi Wilder
	Elliptic, Great Britain
TS07-3 **12:05 PM**	**Privacy-Preserving Netting in Local Energy Grids**
	Jacob Eberhardt, Marco Peise, Stefan Tai, Dong-Ha Kim
	Technische Universität Berlin, Germany

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

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

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**
	Hao Guo, Wanxin Li, Ehsan Meamari, Chien-Chung Shen, Mark Nejad
	University of Delaware, USA
SS01-2 **8:45 AM**	**Ransomware as a Service using Smart Contracts and IPFS**
	Christos Karapapas, Iakovos Pittaras, Nikos Fotiou, George Polyzos
	Athens University of Economics and Business, Greece
SS01-3 **9:00 AM**	**HushRelay: Privacy-Preserving Routing Algorithm for Off-Chain Payments**
	Subhra Mazumdar[1], Sushmita Ruj[2], Ram Govind Singh[1], Arindam Pal[2]
	[1]Indian Statistical Institute Kolkata, India ***[2]Data61 CSIRO, Australia***
SS01-4 **9:15 AM**	**A Blockchain-based Decentralized Data Sharing Infrastructure for Off-grid Networking**
	Harris Niavis[1], Nikolaos Papadis[1], Venu Reddy[2], Hanumantha Rao Morusupalli[2], Leandros Tassiulas[1]
	[1]Yale University, USA *[2]Tata Consultancy Services*
SS01-5 **9:30 AM**	**Shellproof: More Efficient Zero-Knowledge Proofs for Confidential Transactions in Blockchain**
	Xianfeng Li, Chongjian Xu, Qinglin Zhao

	Peking University Shenzhen Graduate School, China

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 **4:15 PM**	**From Legal Agreements to Blockchain Smart Contracts**
	Ravi Rahman, Lalana Kagal
	Massachusetts Institute of Technology, USA
SS02-2 **4:30 PM**	**A Preliminary Study on Using Acceptance Tests for Representing Business Requirements of Smart Contracts**
	Patricia Vilain[1], John Mylopoulos[2]
	[1]*Universidade Federal de Santa Catarina, Brazil* [2]*University of Toronto, Canada*
SS02-3 **4:45 PM**	**Building Hybrid DApps using Blockchain Tactics? The Meta-Transaction Example**
	Florian Blum, Benedikt Severin, Michael Hettmer, Philipp Hückinghaus, Volker Gruhn
	University of Duisburg-Essen, Germany
SS02-4 **5:00 PM**	**A Cost-efficient IoT Forensics Framework with Blockchain**
	Suat Mercan, Mumin Cebe, Ege Tekiner, Kemal Akkaya, Melissa Chang, Selcuk Uluagac
	Florida International University, USA

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

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

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
	HashCloak Inc., Canada
Tutorial 5	**Building Your Own Blockchain in Under Two Hours with Substrate**
	Bruno Skvorc
	Web3 Foundation, Croatia

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
	University of Luxembourg, Luxemburg
Tutorial 2	**Practical Introduction to Blockchain-Based Remote Electronic Voting**
	Christian Killer, Bruno Rodrigues, Eder John Scheid, Muriel Franco, Burkhard Stiller
	University of Zürich, Switzerland

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
	Protocol Labs, Portugal
Tutorial 7	**Real-world Formal Verification of Smart Contracts using the K Framework (Sponsored)**
	Everett Hildenbrandt, Daejun Park, Yi Zhang, Grigore Roşu
	Runtime Verification
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
	AxLabs, Switzerland
Tutorial 8	**Building with Algorand 2.0: Everything you need to know**
	Russ Fustino
	Algorand

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

Poster/Demo Session 1A - 10:00 AM **Chair: Qinghua Lu, *Data61 of CSIRO, Australia***	
10:00 AM	**Verification of Customizable Blockchain Consensus Rule for Assurance of Fault Tolerance in a Network of Distrusting Organizations**
	Ryo Kawahara
	IBM Research, Tokyo
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
	National Taiwan University, Taiwan
10:30 AM	**Crypto Terminal: A New Open Device For Securing Blockchain Wallets**
	Pascal Urien
	Telecom ParisTech, France
10:45 AM	**TRUSTD: Combat Fake Content using Blockchain and Collective Signature Technologies**
	Zakwan Jaroucheh, Mohammad Alissa, William J Buchanan
	Edinburgh Napier University, Great Britain
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]*Bitfury, The Netherlands* [2]*University of Twente, The Netherlands* [3]*Skoltech, Russia*
11:15 AM	**SkillCheck: An Incentive-based Certification System using Blockchains**
	Swaprava Nath, Jay Gupta
	IIT Kanpur, India
11:30 AM	**Vote Delegation and Malicious Parties**
	Hans Gersbach, Akaki Mamageishvili, Manvir Schneider
	ETH Zurich, Switzerland

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

Poster/Demo Session 1B - 10:00 AM
Chair: Yuxi Cai, *University of Toronto, Canada*

10:00 AM	**Profiling of Malicious Users Using Simple Honeypots on the Ethereum Blockchain Network**
	Kazuki Hara, Teppei Sato, Mitsuyoshi Imamura, Kazumasa Omote
	University of Tsukuba, Japan
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]
	[1]Fujitsu Research, China *[2]Fujitsu Research, Japan*
10:30 AM	**Democratization of Smart Contracts: A Prototype for Automated Contract Generation**
	Felix Franz, Tobias Fertig, Andreas E Schutz
	University of Applied Sciences Wurzburg-schweinfurt, Germany
10:45 AM	**SC-Flare: Cooperative DDoS Signaling based on Smart Contracts**
	Bruno Rodrigues, Spasen Trendafilov, Eder John Scheid, Burkhard Stiller
	University of Zurich, Switzerland
11:00 AM	**Wallet Contracts on Ethereum**
	Monika Di Angelo, Gernot Salzer
	TU Wien, Austria
11:15 AM	**Rational Exchange: Incentives in Atomic Cross Chain Swaps**
	Janick Rueegger[1], Guilherme Sperb Machado[2,3]
	[1]Swisscom, Switzerland *[2]SIBEX, Switzerland*

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

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
	IOTA Foundation, Germany
1:15 PM	**Gamified Service Exchange Platform on Blockchain for IoT Business Agility**
	Shahin Gheitanchi
	IEEE, Great Britain
1:30 PM	**EcoBoost: Efficient Bootstrapping for Confidential Transactions**
	Chenggang Wang1, Boyang Wang1, Xinxin Fan2
	1University of Cincinnati, USA *2Hyperconnect Lab Inc, USA*
1:45 PM	**Balance Transfers and Bailouts in Credit Networks using Blockchains**
	Roopa Vishwanathan, Kartick Kolachala, Lalitha Muthu Subramanian
	New Mexico State University, USA
2:00 PM	**Distributed Consensus for Mobile Devices using Online Brokers**
	Mehrdad Kiamari, Bhaskar Krishnamachari, Muhammad Naveed, Seokgu Yun
	University of Southern California, USA
2:15 PM	**A Blockchain-Based Privacy-Preserving Intelligent Charging Station Selection for Electric Vehicles**
	Syed Muhammad Danish1, Kaiwen Zhang1, Hans-Arno Jacobsen2
	1Ecole de Tecnologie Superieure ETS, Canada *2University of Toronto, Canada*
2:30 PM	**Determining Optimal Shard Size in a Hierarchical Blockchain Architecture**

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

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

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

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]*Runtime Verification, USA* [2]*Runtime Verification, Romania* [3]*University of Illinois Urbana Champaign, USA*
4:15 PM	**Energy Consumption Analysis of XRP Validator**
	Crystal A Roma, M Anwar Hasan
	University of Waterloo, Canada
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]*UNSW, Australia* [2]*QUT, Australia*
4:45 PM	**PLEDGE: A Proof-of-Honesty based Consensus Protocol for Blockchain-based IoT Systems**
	Imran Makhdoom
	University of Technology Sydney, Australia

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
	University of Waterloo, Canada
4:15 PM	**FabricUnit: A Framework for Faster Execution of Unit Tests on Hyperledger Fabric**
	Shashank Motepalli[1], Patricia Vilain[2], Arno Jacobsen[1]
	[1]*University of Toronto, Canada* [2]*Universidade Federal de Santa Catarina, Brazil*
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]
	[1]*CSIRO, Australia* [2]*CSIRO Data61, Australia*
4:45 PM	**Leveraging Lightweight Blockchain to Establish Data Integrity for Surveillance Cameras**
	Regio Michelin, Nadeem Ahmed, Salil S. Kanhare, A Seneviratne, Sanjay Jha
	UNSW, Australia

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
	IOTA Foundation, Germany
10:15 AM	**Gamified Service Exchange Platform on Blockchain for IoT Business Agility**
	Shahin Gheitanchi
	IEEE, Great Britain
10:30 AM	**EcoBoost: Efficient Bootstrapping for Confidential Transactions**
	Chenggang Wang[1], Boyang Wang[1], Xinxin Fan[2]

	1University of Cincinnati, USA *2Hyperconnect Lab Inc, USA*
10:45 AM	**Balance Transfers and Bailouts in Credit Networks using Blockchains**
	Roopa Vishwanathan, Kartick Kolachala, Lalitha Muthu Subramanian
	New Mexico State University, USA
11:00 AM	**Distributed Consensus for Mobile Devices using Online Brokers**
	Mehrdad Kiamari, Bhaskar Krishnamachari, Muhammad Naveed, Seokgu Yun
	University of Southern California, USA
11:15 AM	**A Blockchain-Based Privacy-Preserving Intelligent Charging Station Selection for Electric Vehicles**
	Syed Muhammad Danish1, Kaiwen Zhang1, Hans-Arno Jacobsen2
	1Ecole de Tecnologie Superieure ETS, Canada *2University of Toronto, Canada*
11:30 AM	**Determining Optimal Shard Size in a Hierarchical Blockchain Architecture**
	Shyam Kantesariya, Dhrubajyoti Goswami
	Concordia University, Canada
11:45 AM	**Architecting Configurable Blockchain Network Simulators: A Model-driven Perspective**
	Sotirios Liaskos, Tarun Anand, Nahid Alimohammadi
	York University, Canada

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
	University of Applied Sciences Wurzburg-schweinfurt, Germany
10:15 AM	**A Containerized Proof-of-Concept Implementation of LightChain system**
	Yahya Hassanzadeh-Nazarabadi1, Nazir Nayal2, Shadi Sameh Hamdan2, Oznur Ozkasap2, Alptekin Küpçü2

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

Poster/Demo Session 5A - 1:00 PM
Chair: Nicholas Fung, University of Toronto, Canada

1:00 PM	**Crypto Terminal: A New Open Device For Securing Blockchain Wallets**
	Pascal Urien
	Telecom ParisTech, France

1:15 PM	**TRUSTD: Combat Fake Content using Blockchain and Collective Signature Technologies**
	Zakwan Jaroucheh, Mohammad Alissa, William J Buchanan
	Edinburgh Napier University, Great Britain
1:30 PM	**Incorruptible Auditing: Blockchain-Powered Graph Database Management**
	Victor Ermolaev1, Indrek Klangberg2, Yash Madhwal3, Silver Vapper2, Sjoerd Wels2, Yury Yanovich1
	1Bitfury, The Netherlands *2University of Twente, The Netherlands* *2Skoltech, Russia*
1:45 PM	**SkillCheck: An Incentive-based Certification System using Blockchains**
	Swaprava Nath, Jay Gupta
	IIT Kanpur, India
2:00 PM	**Vote Delegation and Malicious Parties**
	Hans Gersbach, Akaki Mamageishvili, Manvir Schneider
	ETH Zurich, Switzerland
2:15 PM	**Evaluation of Security and Performance of Master Node Protocol in the Bitcoin Peer-to-Peer Network**
	Muntadher Fadhil Sallal
	Nottingham Trent University, Great Britain
2:30 PM	**Formalizing Correct-by-Construction Casper in Coq**
	Elaine Li1, Traian Serbanuta2, Denisa Diaconescu2, Grigore Rosu3
	1Runtime Verification, USA *2Runtime Verification, Romania* *3University of Illinois Urbana Champaign, USA*
2:45 PM	**Energy Consumption Analysis of XRP Validator**
	Crystal A Roma, M Anwar Hasan
	University of Waterloo, Canada

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
	Florida International University, USA
1:15 PM	**SC-Flare: Cooperative DDoS Signaling based on Smart Contracts**
	Bruno Rodrigues, Spasen Trendafilov, Eder John Scheid, Burkhard Stiller
	University of Zurich, Switzerland
1:30 PM	**Wallet Contracts on Ethereum**
	Monika Di Angelo, Gernot Salzer
	TU Wien, Austria
1:45 PM	**Rational Exchange: Incentives in Atomic Cross Chain Swaps**
	Janick Rueegger1, Guilherme Sperb Machado2,3
	1Swisscom, Switzerland *2SIBEX, Switzerland* *3AxLabs, Switzerland*
2:00 PM	**Mining Blocks in a Row: A Statistical Study of Fairness in Bitcoin Mining**
	Shengnan Li, Zhao Yang, Claudio Tessone
	University of Zurich, Switzerland
2:15 PM	**Performance and Fault Tolerance Tradeoffs in Sharded Permissioned Blockchains**
	Chunyu Mao, Anh Duong Nguyen, Wojciech Golab
	University of Waterloo, Canada
2:30 PM	**FabricUnit: A Framework for Faster Execution of Unit Tests on Hyperledger Fabric**
	Shashank Motepalli1, Patricia Vilain2, Arno Jacobsen1
	1University of Toronto, Canada *2Universidade Federal de Santa Catarina, Brazil*

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
	1UNSW, Australia *2QUT, Australia*
9:15 PM	**PLEDGE: A Proof-of-Honesty based Consensus Protocol for Blockchain-based IoT Systems**
	Imran Makhdoom
	University of Technology Sydney, Australia
9:30 PM	**Verification of Customizable Blockchain Consensus Rule for Assurance of Fault Tolerance in a Network of Distrusting Organizations**
	Ryo Kawahara
	IBM Research, Tokyo
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
	National Taiwan University, Taiwan

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 Lu1, Mark Staples1, Hugo O'Connor1, Shiping Chen2, Adnene Guabtni1
	1CSIRO, Australia *2CSIRO Data61, Australia*
9:15 PM	**Leveraging Lightweight Blockchain to Establish Data Integrity for Surveillance Cameras**
	Regio Michelin, Nadeem Ahmed, Salil S. Kanhare, A Seneviratne, Sanjay Jha
	UNSW, Australia
9:30 PM	**Profiling of Malicious Users Using Simple Honeypots on the Ethereum Blockchain Network**
	Kazuki Hara, Teppei Sato, Mitsuyoshi Imamura, Kazumasa Omote

	University of Tsukuba, Japan
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]*Fujitsu Research, China* [2]*Fujitsu Research, Japan*