PODC 2019 Program

MONDAY JULY 29, 2019

Continental Breakfast (Mandarin Foyer, 8:00–9:00)

Tutorial 1 (Mandarin Ballroom B, 9:00–10:00)

Y. Annie Liu and Scott D. Stoller: From Classical to Blockchain Consensus: What are the Exact Algorithms?

Coffee Break (Mandarin Foyer, 10:00–10:30)

Tutorial 1 Continued (Mandarin Ballroom B, 10:30–12:00)

Lunch (Mandarin Foyer and Ballroom B, 12:00–2:00)

Tutorial 2 (Mandarin Ballroom B, 2:00–3:30)

Ethan Buchman: Byzantine Fault Tolerant State Machine Replication in Any Programming Language

Coffee Break (Mandarin Foyer, 3:30–4:00)

Tutorial 2 Continued (Mandarin Ballroom B, 4:00–5:30)

Welcome Reception (Ottawa Room, 5:30–7:30)

TUESDAY JULY 30, 2019

Continental Breakfast (Mandarin Foyer, 8:00–8:50)

Opening Remarks (Mandarin Ballroom, 8:50–9:00)

Keynote 1 (Mandarin Ballroom, 9:00–10:00)

Philipp Woelfel: Towards a Theory of Randomized Shared Memory Algorithms

Coffee Break (Mandarin Foyer, 10:00–10:30)

Session 1 (Mandarin Ballroom, 10:30–12:30)

Chair: James Aspnes

- 10:30–10:50: Symmetry Breaking in the Plane: Rendezvous by Robots with Unknown Attributes. Jurek Czyzowicz, Leszek Gasieniec, Ryan Killick, Evangelos Kranakis.
- 10:50–11:10: Composable Computation in Discrete Chemical Reaction Networks. Eric E. Severson, David Haley, David Doty.
- 11:10–11:30: How to Spread a Rumor: Call Your Neighbors or Take a Walk? George Giakkoupis, Frederik Mallmann-Trenn, Hayk Saribekyan.
- 11:30–12:00:
  Efficient Size Estimation and Impossibility of Termination in Uniform Dense Population Protocols. David Doty, Mahsa Eftekhari.
  On Counting the Population Size. Petra Berenbrink, Dominik Kaaser, Tomasz Radzik.
- 12:00–12:20: Self-Stabilizing Leader Election. Hsueh-Ping Chen, Ho-Lin Chen.
- 12:20–12:25: Brief Announcement: Logarithmic Expected-Time Leader Election in Population Protocol Model. Yuichi Sudo, Fukuhito Ooshita, Taisuke Izumi, Hirotsugu Kakugawa, Toshimitsu Masuzawa.
- 12:25–12:30: Brief Announcement: On Site Fidelity and the Price of Ignorance in Swarm Robotic Central Place Foraging Algorithms. Abhinav Aggarwal, G. Matthew Fricke, Diksha Gupta, Melanie E. Moses.

Lunch (Mandarin Foyer and Ballroom, 12:30–2:00)

Session 2 (Mandarin Ballroom, 2:00–3:25)

Chair: Yuval Emek

- 2:00–2:20: Improved Distributed Expander Decomposition and Nearly Optimal Triangle Enumeration. Yi-Jun Chang, Thatchaphol Saranurak.
- 2:20–2:40: Fast Approximate Shortest Paths in the Congested Clique. Keren Censor-Hillel, Michal Dory, Janne H. Korhonen, Dean Leitersdorf.
- 2:40–3:00: Quantum Distributed Algorithm for the All-Pairs Shortest Path Problem in the CONGEST-CLIQUE Model. Taisuke Izumi, François Le Gall.
- 3:00–3:20: Deterministic Distributed Dominating Set Approximation in the CONGEST Model. Janosch Deurer, Fabian Kuhn, Yannic Maus.
- 3:20–3:25: Brief Announcement: Optimal Distributed Covering Algorithms. Ran Ben Basat, Guy Even, Ken-ichi Kawarabayashi, Gregory Schwartzman.

Coffee Break (Mandarin Foyer, 3:25–3:55)

Session 3 (Mandarin Ballroom, 3:55–5:30)

Chair: Peter Robinson

- 3:55–4:15: Secure Distributed Computing Made Optimal. Merav Parter, Eylon Yogev.
- 4:15–4:35: With Great Speed Come Small Buffers: Space-Bandwidth Tradeoffs for Routing. Avery Miller, Boaz Patt-Shamir, Will Rosenbaum.
- 4:35–4:55: Plain SINR is Enough! Magnus M. Halldorsson, Tigran Tonoyan.
- 4:55–5:15: Efficient Multiparty Interactive Codingfor Insertions, Deletions, and Substitutions. Ran Gelles, Yael Tauman Kalai, Govind Ramnarayan.
- 5:15–5:20: Brief Announcement: Multiparty Interactive Communication with Private Channels. Abhinav Aggarwal, Varsha Dani, Thomas P. Hayes, Jared Saia.
- 5:20–5:25: Brief Announcement: Coded State Machine-Scaling State Machine Execution under Byzantine Faults. Songze Li, Saeid Sahraei, Mingchao Yu, Salman Avestimehr, Sreeram Kannan, Pramod Viswanath.
- 5:25–5:30: Brief Announcement: On Termination of a Flooding Process. Walter Hussak, Amitabh Trehan.

Business Meeting (Mandarin Ballroom, 5:45–7:15)

WEDNESDAY JULY 31, 2019

Continental Breakfast (Mandarin Foyer, 8:00–9:00)

Keynote 2 (Mandarin Ballroom, 9:00–10:00)

Ronitt Rubinfeld: Local Computation Algorithms

Coffee Break (Mandarin Foyer, 10:00–10:30)

Session 4 (Mandarin Ballroom, 10:30–12:30)

Chair: Eric Ruppert

- 10:30–10:50: Optimal Memory-Anonymous Symmetric Deadlock-Free Mutual Exclusion. Zahra Aghazadeh, Damien Imbs, Michel Raynal, Gadi Taubenfeld, Philipp Woelfel.
- 10:50–11:10: Constant Amortized RMR Complexity Deterministic Abortable Mutual Exclusion Algorithm for CC and DSM Models. Prasad Jayanti, Siddhartha Jayanti.
- 11:10–11:30: Recoverable Mutual Exclusion with Sub-logarithmic RMR Complexity on CC and DSM machines. Prasad Jayanti, Siddhartha Jayanti, Anup Joshi.
- 11:30–11:50: Randomized Concurrent Set Union and Generalized Wake-Up. Siddhartha Jayanti, Robert E. Tarjan, Enric Boix-Adserà.
- 11:50–12:10: Strongly Linearizable Implementations of Snapshots and Other Types. Sean Ovens, Philipp Woelfel.
- 12:10–12:15: Brief Announcement: Fast Concurrent Data Sketches. Arik Rinberg, Alexander Spiegelman, Edward Bortnikov, Eshcar Hillel, Idit Keidar, Hadar Serviansky.
- 12:15–12:20: Brief Announcement: Self-Stabilizing Snapshot Objects for Asynchronous Failure-Prone Networked Systems. Chryssis Georgiou, Oskar Lundström, Elad M. Schiller.
- 12:20–12:25: Brief Announcement: The Recoverable Consensus Hierarchy. Wojciech Golab.
- 12:25–12:30: Brief Announcement: How Fast Reads Affect Multi-Valued Register Simulations. Soma Chaudhuri, Reginald Frank, Jennifer L. Welch.

Lunch (Mandarin Foyer and Ballroom, 12:30–2:00)

Session 5 (Mandarin Ballroom, 2:00–3:30)

Chair: Philipp Woelfel

- 2:00–2:20: Topological Characterization of Consensus under General Message Adversaries. Thomas Nowak, Ulrich Schmid, Kyrill Winkler.
- 2:20–2:40: Can Distributed Uniformity Testing Be Local? Uri Meir, Dor Minzer, Rotem Oshman.
- 2:40–3:00: Hardness of Distributed Optimization. Nir Bacrach, Keren Censor-Hillel, Michal Dory, Yuval Efron, Dean Leitersdorf, Ami Paz.
- 3:00–3:20: Broadcast Congested Clique: Planted Cliques and Pseudorandom Generators. Lijie Chen, Ofer Grossman.
- 3:20–3:25: Brief Announcement: Connectivity Lower Bounds in Broadcast Congested Clique. Shreyas Pai, Sriram V. Pemmaraju.
- 3:25–3:30: Brief Announcement: Does Preprocessing Help under Congestion? Klaus-Tycho Foerster, Janne H. Korhonen, Joel Rybicki, Stefan Schmid.

Coffee Break (Mandarin Foyer, 3:30–4:00)

Session 6 (Mandarin Ballroom, 4:00–5:30)

Chair: Avery Miller

- 4:00–4:20: The Distributed Complexity of Locally Checkable Problems on Paths is Decidable. Alkida Balliu, Sebastian Brandt, Yi-Jun Chang, Dennis Olivetti, Mikaël Rabie, Jukka Suomela.
- 4:20–4:40: Hardness of Exact Distance Queries in Sparse Graphs through Hub Labeling. Adrian Kosowski, Przemyslaw Uznanski, Laurent Viennot.
- 4:40–5:00: On the Complexity of Distributed Splitting Problems. Philipp Bamberger, Mohsen Ghaffari, Fabian Kuhn, Yannic Maus, Jara Uitto.
- 5:00–5:20: On the Use of Randomness in Local Distributed Graph Algorithms. Mohsen Ghaffari, Fabian Kuhn.
- 5:20–5:25: Brief Announcement: Message Reduction in the LOCAL Model is a Free Lunch. Shimon Bitton, Yuval Emek, Taisuke Izumi, Shay Kutten.
- 5:25–5:30: Brief Announcement: P-SLOCAL-Completeness of Maximum Independent Set Approximation. Yannic Maus.

Banquet (Captain Matthew Flinders, 6:30–10:00)

Boat Cruise on the “Captain Matthew Flinders”
Docked at Queen’s Quay Terminal
Address: 207 Queen’s Quay West

THURSDAY AUGUST 1, 2019

Continental Breakfast (Mandarin Foyer, 8:00–9:00)

Keynote 3 (Mandarin Ballroom, 9:00–10:00)

Ilya Sergey: Engineering Distributed Systems that We Can Trust (and Also Run)

Coffee Break (Mandarin Foyer, 10:00–10:30)

Session 7 (Mandarin Ballroom, 10:30–12:35)

Chair: Maurice Herlihy

- 10:30–10:50: The Consensus Number of a Cryptocurrency. Rachid Guerraoui, Petr Kuznetsov, Matteo Monti, Matej Pavlovič, Dragos-Adrian Seredinschi.
- 10:50–11:10: Communication Complexity of Byzantine Agreement, Revisited. Ittai Abraham, T-H. Hubert Chan, Danny Dolev, Kartik Nayak, Rafael Pass, Ling Ren, Elaine Shi.
- 11:10–11:30: Exact Byzantine Consensus on Undirected Graphs under Local Broadcast Model. Muhammad Samir Khan, Syed Shalan Naqvi, Nitin H. Vaidya.
- 11:30–11:50: Asymptotically Optimal Validated Asynchronous Byzantine Agreement. Ittai Abraham, Dahlia Malkhi, Alexander Spiegelman.
- 11:50–12:10: HotStuff: BFT Consensus with Linearity and Responsiveness. Maofan Yin, Dahlia Malkhi, Michael K. Reiter, Guy Golan Gueta, Ittai Abraham.
- 12:10–12:30: Fault Tolerant Gradient Clock Synchronization. Johannes Bund, Christoph Lenzen, Will Rosenbaum.
- 12:30–12:35: Brief Announcement: Bootstrapping Public Blockchains Without a Trusted Setup. Abhinav Aggarwal, Mahnush Movahedi, Jared Saia, Mahdi Zamani.

Lunch (Mandarin Foyer and Ballroom, 12:35–2:05)

- Industry Lunch for Students and Post-Docs (Mandarin Ballroom A)
- Regular Lunch (Mandarin Ballroom B)

Session 8 (Mandarin Ballroom, 2:05–2:55)

Chair: Thomas Nowak

- 2:05–2:35:
  Hardness of Minimal Symmetry Breaking in Distributed Computing. Alkida Balliu, Juho Hirvonen, Dennis Olivetti, Jukka Suomela.
  An Automatic Speedup Theorem for Distributed Problems. Sebastian Brandt.
- 2:35–2:55: A Sharp Threshold Phenomenon for the Distributed Complexity of the Lovász Local Lemma. Sebastian Brandt, Yannic Maus, Jara Uitto.

Session 9 (Mandarin Ballroom, 2:55–3:45)

Chair: Vassos Hadzilacos

- 2:55–3:15: Reconfigurable Atomic Transaction Commit. Manuel Bravo, Alexey Gotsman.
- 3:15–3:35: The Impact of RDMA on Agreement. Marcos K. Aguilera, Naama Ben-David, Rachid Guerraoui, Virendra Marathe, Igor Zablotchi.
- 3:35–3:40: Brief Announcement: Hyaline: Fast and Transparent Lock-Free Memory Reclamation. Ruslan Nikolaev, Binoy Ravindran.
- 3:40–3:45: Brief Announcement: Layering Data Structures over Skip Graphs for Increased NUMA Locality. Samuel Thomas, Hammurabi Mendes.

Coffee Break (Mandarin Foyer, 3:45–4:15)

Session 10 (Mandarin Ballroom, 4:15–5:25)

Chair: Youla Fatourou

- 4:15–4:35: Partially Replicated Causally Consistent Shared Memory: Lower Bounds and an Algorithm. Zhuolun Xiang, Nitin H. Vaidya.
- 4:35–4:55: Vorpal: Vector Clock Ordering For Large Persistent Memory Systems. Kunal Korgaonkar, Joseph Izraelevitz, Jishen Zhao, Steven Swanson.
- 4:55–5:15: On the Parallels between Paxos and Raft, and how to Port Optimizations. Zhaoguo Wang, Changgeng Zhao, Shuai Mu, Haibo Chen, Jinyang Li.
- 5:15–5:20: Brief Announcement: Linearizable State Machine Replication of State-Based CRDTs without Logs. Jan Skrzypczak, Florian Schintke, Thorsten Schütt.
- 5:20–5:25: Brief Announcement: On Mixing Eventual and Strong Consistency: Bayou Revisited. Maciej Kokociński, Tadeusz Kobus, Paweł T. Wojciechowski.

FRIDAY AUGUST 2, 2019

Continental Breakfast (Mandarin Foyer, 8:00–9:00)

Session 11 (Mandarin Ballroom, 9:00–10:20)

Chair: Fabian Kuhn

- 9:00–9:20: Massively Parallel Algorithms for Finding Well-Connected Components in Sparse Graphs. Sepehr Assadi, Xiaorui Sun, Omri Weinstein.
- 9:20–9:40: The Complexity of $(\Delta + 1)$ Coloring in Congested Clique, Massively Parallel Computation, and Centralized Local Computation. Yi-Jun Chang, Manuela Fischer, Mohsen Ghaffari, Jara Uitto, Yufan Zheng.
- 9:40–10:00: Massively Parallel Computation of Matching and MIS in Sparse Graphs. Soheil Behnezhad, Sebastian Brandt, Mahsa Derakhshan, Manuela Fischer, MohammadTaghi Hajiaghayi, Richard M. Karp, Jara Uitto.
- 10:00–10:20: Weighted Matchings via Unweighted Augmentations. Buddhima Gamlath, Sagar Kale, Slobodan Mitrovic, Ola Svensson.

Coffee Break (Mandarin Foyer, 10:20–10:50)

Session 12 (Mandarin Ballroom, 10:50–12:30)

Chair: Valerie King

- 10:50–11:10: Implementing Mediators with Asynchronous Cheap Talk. Ittai Abraham, Danny Dolev, Ivan Geffner, Joseph Y. Halpern.
- 11:10–11:30: Distributed Minimum Degree Spanning Trees. Michael Dinitz, Magnus M. Halldorsson, Taisuke Izumi, Calvin Newport.
- 11:30–11:50: Improved Distributed Approximations for Minimum-Weight Two-Edge-Connected Spanning Subgraph. Michal Dory, Mohsen Ghaffari.
- 11:50–12:10: Near-Additive Spanners In Low Polynomial Deterministic CONGEST Time. Michael Elkin, Shaked Matar.
- 12:10–12:30: A Trivial Yet Optimal Solution to Vertex Fault Tolerant Spanners. Greg Bodwin, Shyamal Patel.

Closing Remarks (Mandarin Ballroom, 12:30–12:35)

Lunch (Mandarin Foyer and Ballroom, 12:35–2:00)

Tutorials in Parallel (2:00–3:30)

- Tutorial 3: Klaus-Tycho Foerster: Central Control over Distributed Asynchronous Systems: A Tutorial on Software-Defined Networks and Consistent Network Updates (Mandarin Ballroom A)
- Tutorial 4: Wojciech Golab: Specifying, Implementing, and Verifying Algorithms for Persistent Memory (Mandarin Ballroom B)

Coffee Break (Mandarin Foyer, 3:30–4:00)

Tutorials Continued (4:00–5:00)

Workshop Programs

MONDAY JULY 29, 2019

Workshop on Biological Distributed Algorithms (Mandarin Ballroom A, 8:25–5:20)

- 8:25–8:30: Organizer's Welcome
- 8:30–9:00: Robustly Foraging Using the Golden Ratio. Jared Saia.
- 9:00–9:20: Collective contests: ant colonies invest in defense according to their opponent, and group size interacts with resources held. Anna Dornhaus, Victor Paat, Kenneth Chapin.
- 9:20–9:40: Better tired than lost: turtle ant trail networks favor coherence over shortest paths. Arjun Chandrasekhar, James Marshall, Saket Navlakha, Deborah M. Gordon.
- 9:40–10:00: Spatial organization of food distribution on the nests of the primitively eusocial paper wasp Ropalidia marginata. Nitika Sharma, Raghavendra Gadagkar.
- 10:00–10:30: Coffee Break (Mandarin Foyer)
- 10:30–11:00: Measuring and modeling how C. elegans explores its environment. William Ryu.
- 11:00–11:10: Lower Bounds for Dynamic Distributed Task Allocation. Hsin-Hao Su, Nicole Wein.
- 11:10–11:30: Remember the Past and Forget Thresholds. Anna Dornhaus, Nicole Leitner, Nancy Lynch, Frederik Mallmann-Trenn, Dominik Pajak.
- 11:30–12:00: Discussion
- 12:00–1:00: Lunch (Mandarin Foyer and Ballroom A)
- 1:00–1:20: Counting to Ten with Two Fingers: Compressed Counting with Spiking Neurons. Yael Hitron, Merav Parter.
- 1:20–1:40: Spike-Based Winner-Take-All Computation: Fundamental Limits and Order-Optimal Circuits. Lili Su, Chia-Jung Chang, Nancy Lynch.
- 1:40–1:50: Integrating Temporal Information to Spatial Information in a Neural Circuit. Mien Brabeeba Wang, Nancy Lynch.
- 1:50–2:00: Continual Boltzmann Sampling of Approximate Solutions to NP-hard Optimization Problems. Jorge Lobo, Nava Rubin.
- 2:00–2:30: A little help on the fly, please? Joel Levine.
- 2:30–2:40: Break & Catch up
- 2:40–3:00: Deterministic Leader Election in Programmable Matter. Yuval Emek, Shay Kutten, Ron Lavi, William K. Moses Jr.
- 3:00–3:20: Selecting a Leader in a Network of Finite State Machines. Yehuda Afek, Yuval Emek, Noa Kolikant.
- 3:20–3:30: Fast Shape Formation with Hybrid Programmable Matter. Kristian Hinnenthal, Christian Scheideler, Dorian Rudolph.
- 3:30–4:00: Coffee Break (Mandarin Foyer)

- 4:00–4:20: On the Minimal Set of Inputs Required for Efficient Neuro-Evolved Foraging. John Erickson, Abhinav Aggarwal, Melanie Moses.
- 4:20–4:30: How to Color a French Flag: Biologically Inspired Algorithms for Scale-Invariant Patterning. Alberto Ancona, Ayesha Bajwa, Nancy Lynch, Frederik Mallmann-Trenn.
- 4:30–5:00: Large-scale neuronal modeling on GPUs. Danny Forger.
- 5:00–5:10: A Most Irrational Foraging Algorithm. Abhinav Aggarwal, William Vining, Diksha Gupta, Jared Saia, Melanie Moses.
- 5:10–5:20: Self Synchronized Radio Transmission of Nanorobots. Shlomi Dolev, Ram Prasadh Narayanan, Christian Scheideler.

FRIDAY AUGUST 2, 2019

Workshop on Security of Permissionless Systems (Toronto Room, 9:20–3:30)

- 9:20–9:50: Maurice Herlihy
- 9:50–10:20: Nitin Vaidya
- 10:20–10:50: Coffee Break (Mandarin Foyer)
- 10:50–11:20: Diksha Gupta
- 11:20–11:50: Aniket Kate
- 11:50–12:20: Kevin Sekniqi
- 12:20–1:20: Lunch (Mandarin Foyer)
- 1:20–1:50: Mahnush Movahedi
- 1:50–2:20: Valerie King
- 2:20–2:50: Gopal Pandurangan
- 2:50–3:30: Round Table Discussion