2021 SIAM Conference on Applied and Computational Discrete Algorithms

Please note that this document will not be updated once it is posted. For the latest updates, please see the ACDA21 online conference program

Monday, July 19 (all times EDT = UTC-4)

Monday, July 19, 9:30 – 9:45 **Welcome Remarks**
Conference Co-chairs: Bruce Hendrickson, Lawrence Livermore National Lab & Blair D. Sullivan, University of Utah

Monday, July 19, 9:45 – 10:15 **Technical Talk Panel 1**
Moderator: Jeremy Kepner, MIT Lincoln Laboratory, USA

Paul Hovland, **Jacobian sparsity detection using Bloom filters**
Michael Mitzenmacher, **Queues with small advice**
Stephane Chretien, Oya Ekin Karasan, Ecenur Oguz and Mustafa C. Pinar, **The quantile matching problem and point cloud registration**

Monday, July 19, 10:25 – 10:55 **Technical Talk Panel 2**
Moderator: Alex Pothen, Purdue University, USA

Thomas Lavastida, Benjamin Moseley, R Ravi and Chenyang Xu, **Using predicted weights for ad delivery**
Eugenio Angriman, Henning Meyerhenke, Christian Schulz and Bora Ucar, **Fully-dynamic weighted matching approximation in practice**
S M Ferdous, Arif Khan, Alex Pothen, Ajay Panyala and Mahantesh Halappanavar, **A parallel approximation algorithm for maximizing submodular b-matching**

Monday, July 19, 11:05 – 11:45 **Technical Talk Panel 3**
Moderator: Sam McCauley, Williams College, USA

Zachary Boyd, Nicolas Fraiman, Jeremy Marzuola, Peter Mucha, Braxton Osting and Jonathan Weare, **A metric on directed graph nodes based on hitting probabilities**
Kimon Fountoulakis, Pan Li and Shenghao Yang, **Local hyper-flow diffusion**
Shaojie Tang and Jing Yuan, **Non-monotone adaptive submodular meta-learning**
Zirui Zhang, Clarisse Ricci, Chao Fan, Li-Tien Cheng, Bo Li and Andrew McCammon, **Binary level-set method for variational implicit solvation model**

Monday, July 19, 11:55 – 12:45 **ACDA Participant Introductions** (instructions forthcoming)
Moderator: Christian Shulz, University of Heidelberg, Germany

Monday, July 19, 12:45 – 1:30 **Joint Plenary 1**
Madhav Marathe, University of Virginia, USA, **Towards scalable and practical real-time computational epidemiology**

Monday, July 19, 1:30 – 2:30 **"Lunchtime" Conversations in Gather**
The conference co-chairs and plenary speakers of ACDA21 would like to invite student and early-career attendees to join them for informal conversations and networking in the ACDA wing of Gather.town. We will be available for small group conversations at tables in the ACDA Gather space during this time (details on how to find us in the space will be in the morning announcements). Please join us!

Monday, July 19, 2:30 – 3:15 **Invited Plenary 1**
Andrew V. Goldberg, Amazon, USA, **Shortest path algorithms for road navigation**

Monday, July 19, 4:15 – 5:55 **Industrial Problems Session**
Chair: Rob Schreiber, Cerebras, USA

Michael A. Frumkin, NVIDIA, USA, **Performance analysis of HPC applications**
Rob Johnson, VMware, USA, **What's left in dictionary design?**

Vahab Mirrokni, Google, USA, **Next generation of parallel and distributed graph mining algorithms: theory and practice**
Edward Rothberg, Gurobi Optimization, USA, **Mixed integer programming - A confluence of algorithms**

2021 SIAM Conference on Applied and Computational Discrete Algorithms
Tuesday, July 20 (all times EDT = UTC-4)

Tuesday, July 20, 9:30 – 9:45 **Conference Announcements**

Tuesday, July 20, 9:45 – 10:15 **Technical Talk Panel 4**
Moderator: Sivan Toledo, Tel Aviv University, Israel

Rameshwar Pratap, Bhisham Dev Verma and Raghav Kulkarni, **Improving tug-of-war sketch using control-variates method**

Johannes Langguth, Ioannis Panagiotas and Bora Ucar, **Shared-memory implementation of the Karp-Sipser kernelization process**

Claudius Proissl and Tobias Rupp, **On the difference between search space size and query complexity in contraction hierarchies**

Tuesday, July 20, 10:15 – 11:45 **Minitutorial: An introduction to combinatorial scientific computing**
Organizers: Rob Bisseling, Henning Meyerhenke and Uwe Naumann
Presenters: Assefaw Gebremedhin, Fredrick Manne and Christian Schulz

Tuesday, July 20, 12:00 – 12:45, **ACDA Business Meeting**
Chair: Cindy Phillips, Sandia National Labs

Tuesday, July 20, 12:45 – 1:30 **Invited Plenary 2**
Uwe Naumann, RWTH-Aachen, Germany, **Matrix-free Jacobian chaining**

Tuesday, July 20, 2:30 – 3:15 **Invited Plenary 3**
Dorit Hochbaum, University of California, Berkeley, USA, **Combinatorial optimization algorithms for clustering and machine learning**

Tuesday, July 20, 4:30 – 5:00 **Technical Talk Panel 5**
Moderator: Jelani Nelson, University of California, Berkeley, USA

Wes Gurnee and David Shmoys, **Fairmandering: A column generation heuristic for fairness-optimized political districting**

Austin Benson, Jon Kleinberg and Nate Veldt, **Augmented sparsifiers for generalized hypergraph cuts**

Monika Henzinger, Alexander Noe and Christian Schulz, **Faster parallel multiterminal cuts**

Tuesday, July 20, 5:10 – 5:40 **Technical Talk Panel 6**
Moderator: Assefaw Gebremedhin, Washington State University, USA

Zirou Qiu, Ruslan Shaydulin, Xiaoyuan Liu, Yuri Alexeev, Christopher Henry and Ilya Safro, **ELRUNA : Elimination rule-based network alignment**

Madison Cooley, Casey Green, Davis Issac, Milton Pividori and Blair Sullivan, **Parameterized algorithms for identifying gene co-expression modules via weighted clique decomposition**

Giulia Guidi, Marquita Ellis, Daniel Rokhsar, Katherine Yelick and Aydın Buluç, **An efficient long-read to long-read aligner and overlapper**

Tuesday, July 20, 5:50 – 6:20 **Technical Talk Panel 6**
Moderator: John Gilbert, University of California, Santa Barbara, USA

Jessica Shi, Laxman Dhulipala and Julian Shun, **Parallel clique counting and peeling algorithms**

Nan Ding, Yang Liu, Samuel Williams and Xiaoye Li, **A message-driven, multi-GPU parallel sparse triangular solver**

Erik G. Boman, Seher Acer, Christian Glusa and Siva Rajamanickam, **Sphynx: A parallel multi-GPU graph partitioner**

Tuesday, July 20, 6:30 – 8:30 **Poster Session**

2021 SIAM Conference on Applied and Computational Discrete Algorithms
Wednesday, July 21 (all times EDT = UTC-4)

Wednesday, July 21, 9:30 – 9:45 **Conference Announcements**

Wednesday, July 21, 9:45 – 10:15 **Technical Talk Panel 8**
Moderator: Jose Moreira, IBM, USA

Xiaoyue Li and John Mulvey, **Optimal portfolio execution in a regime-switching market with non-linear impact costs: Combining dynamic program and neural network**
Rigel Galgana, Cengke Shi, Amy Greenwald and Takehiro Oyakawa, **A dynamic program for computing the joint cumulative distribution function of order statistics**

Wednesday, July 21, 10:15 – 11:45 **Minitutorial: Combinatorial frontiers in computational biology**
Organizers: Lenore J. Cowen and Christine Heitsch
Presenters: Christine Heitsch, Xiaozhe Hu, Smita Krishnaswamy and James Murphy

Wednesday, July 21, 12:00 – 12:45 **Invited Plenary 4**
Lenore J. Cowen, Tufts University, USA, **Diffusion-based methods for biological network analysis**

Wednesday, July 21, 12:45 – 1:30 **Invited Plenary 5**
Henning Meyerhenke, Humboldt University Berlin, Germany, **Scaling up network centrality computations**

Wednesday, July 21, 4:15 – 4:45 **Technical Talk Panel 9**
Moderator: Julian Shun, Massachusetts Institute of Technology, USA

Christopher Brissette and George Slota, **An analysis on the accuracy of Chung-Lu random graph generation**
Torsten Bosse, Ralf Seidler and H. Martin Buecker, **Efficient signed backward substitution for piecewise affine functions via path problems in a directed acyclic graph**
Helen Xu, Sean Fraser and Charles Leiserson, **Multidimensional included and excluded sums**

Wednesday, July 21, 4:55 – 5:25 **Technical Talk Panel 10**
Moderator: Xiaoye Li, Lawrence Berkeley National Lab, USA

Chao Chen, Tianyu Liang and George Biros, **RCHOL: Randomized Cholesky factorization for solving SDD linear systems**
Emily Evans and Amanda Francis, **Algorithmic techniques for finding resistance distances on structured graphs with an application to linear 2--trees**
Shruti Shivakumar, Jiajia Li, Ramakrishnan Kannan and Srinivas Aluru, **Efficient parallel sparse symmetric Tucker decomposition for high-order tensors**

Wednesday, July 21, 5:35 – 6:05 **Technical Talk Panel 11**
Moderator: Emilie Purvine, Pacific Northwest National Lab, USA

Majid Farhadi, Alejandro Toriello and Prasad Tetali, **The traveling firefighter problem**
Jurek Czyzowicz, Ryan Killick, Evangelos Kranakis and Grzegorz Stachowiak, **Search and evacuation with a near majority of faulty agents**
Juan Carlos Martinez Mori and Samitha Samaranayake, **On the request-trip-vehicle assignment problem**

Wednesday, July 21, 6:05 – 6:15 **Best Student Presentation Prize and Best Poster Prize announcements, and conference closeout**