2020 IEEE/ACM Workshop on Machine Learning in High Performance Computing Environments (MLHPC 2020) and Workshop on Artificial Intelligence and Machine Learning for Scientific **Applications (AI4S 2020)**

Virtual Conference 12 November 2020



IEEE Catalog Number: CFP20J40-POD **ISBN:**

978-1-6654-4655-6

Copyright © 2020 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

IEEE Catalog Number:	CFP20J40-POD
ISBN (Print-On-Demand):	978-1-6654-4655-6
ISBN (Online):	978-1-6654-2291-8

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400 Fax: (845) 758-2633 E-mail: curran@proceedings.com Web: www.proceedings.com



2020 IEEE/ACM Workshop on Machine Learning in High Performance Computing Environments (MLHPC) and Workshop on Artificial Intelligence and Machine Learning for Scientific Applications (AI4S) **MLHPC-AI4S 2020**

Table of Contents

Message from the MLHPC Workshop Chairs .vi
Message from the AI4S Workshop Chairs vii
Workshop Organization – MLHPC 2020 viii
Workshop Organization – AI4S 2020 .ix

MLHPC 2020

EventGraD: Event-Triggered Communication in Parallel Stochastic Gradient Descent .1 Soumyadip Ghosh (Department of Electrical Engineering, University of Notre Dame) and Vijay Gupta (Department of Electrical Engineering, University of Notre Dame)
A Benders Decomposition Approach to Correlation Clustering .9 Jovita Lukasik (University of Mannheim, Germany), Margret Keuper (University of Mannheim, Germany), Maneesh Singh (Verisk, USA), and Julian Yarkony (Verisk, USA)
Accelerating GPU-Based Machine Learning in Python using MPI Library: A Case Study with MVAPICH2-GDR .17 S. Mahdieh Ghazimirsaeed (The Ohio State University), Quentin Anthony (The Ohio State University), Aamir Shafi (The Ohio State University), Hari Subramoni (The Ohio State University), and Dhabaleswar K. (DK) Panda (The Ohio State University)
Accelerate Distributed Stochastic Gradient Descent for Nonconvex Optimization with Momentum .29 <i>Guojing Cong (IBM TJ Watson Research Center) and Tianyi Liu (Georgia</i> <i>Institute of Technology)</i>

High-Bypass Learning: Automated Detection of Tumor Cells That Significantly Impact Drug

Response .40

Justin Wozniak (Argonne National Laboratory), Hyunseung Yoo (Argonne

National Laboratory), Jamaludin Mohd-Yusof (Los Alamos National Laboratory), Bogdan Nicolae (Argonne National Laboratory), Nicholson Collier (Argonne National Laboratory), Jonathan Ozik (Argonne National Laboratory), Thomas Brettin (Argonne National Laboratory), and Rick Stevens (Argonne National Laboratory)

Deep Generative Models that Solve PDEs: Distributed Computing for Training Large Data-Free

Models .50..... Sergio Botelho (RocketML Inc), Ameya Joshi (New York University),

Biswajit Khara (Iowa State University), Vinay Rao (RocketML Inc), Soumik Sarkar (Iowa State University), Chinmay Hegde (New York University), Santi Adavani (RocketML Inc), and Baskar Ganapathysubramanian (Iowa State University)

AI4S 2020

Automatic Particle Trajectory Classification in Plasma Simulations .64 Stefano Markidis (KTH Royal Institute of Technology), Ivy Peng (LLNL), Artur Podobas (KTH Royal Institute of Technology), Itthinat Jongsuebchoke (KTH Royal Institute of Technology), Gabriel Bengtsson (KTH Royal Institute of Technology), and Pawel Herman (KTH Royal Institute of Technology)
Reinforcement Learning-Based Solution to Power Grid Planning and Operation under
Uncertainties .72
Xiumin Shang (GEIRI North America), Lin Ye (SGCC Zhejiang Electric
Power Company), Jing Zhang (SGCC Zhejiang Electric Power Company),
Jingping Yang (Jinnua Electric Power Company), Jianping Xu (Jinnua
Ruisheno Diao (GEIRI North America)
Desdictions of Standard and Unstander Electronic Medicine Learned Strangents Medicle 90
Shanti Bhushan (Mississinni State Hnizersitu) Grea W Burgreen
(Mississinni State University), Joshua L. Bowman (Mississinni State
University), Ian D. Dettwiller (Engineer Research and Development
Center (ERDC)), and Wesley Brewer (DoD HPCMP PET / GDIT)
Deep Learning-Based Low-dose Tomography Reconstruction with Hybrid-dose Measurements .88.
Ziling Wu (Virginia Tech, USA), Tekin Bicer (Argonne National
Laboratory, USA), Zhengchun Liu (Argonne National Laboratory, USA),
Vincent De Andrade (Argonne National Laboratory, USA), Yunhui Zhu
(Virginia Tech, USA), and Ian T. Foster (Argonne National Laboratory,
USA)
How Good is Your Scientific Data Generative Model? .96
Yuxin Yang (Los Alamos Natinal Laboratory, Kent State University), Ben
Gremillion (The University of Texas at Austin, Los Alamos National
Laboratory), Xitong Zhang (Los Alamos National Laboratory, Michigan
State University), Youzuo Lin (Los Alamos National Laboratory), Brenat Mahlhara (Los Alamos National Laboratory), and Oiguo Cugu (Kant State
Voniberg (Los Alumos National Laboratory), and Qiang Guan (Kent State University)

Author Index 103