2022 IEEE International Conference on Rebooting Computing (ICRC 2022)

San Francisco, California, USA 8-9 December 2022



IEEE Catalog Number: CFP22G30-POD ISBN:

979-8-3503-4710-4

Copyright © 2022 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:
 CFP22G30-POD

 ISBN (Print-On-Demand):
 979-8-3503-4710-4

 ISBN (Online):
 979-8-3503-4709-8

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



2022 IEEE International Conference on Rebooting Computing (ICRC) ICRC 2022

Table of Contents

Conference Organization
ICRC 2022
An Efficient Algebraic Representation for Graph States for Measurement-Based Quantum Computing
Analog Neural Network Inference Accuracy in One-Selector One-Resistor Memory Arrays
ATHENA: Enabling Codesign for Next-Generation AI/ML Architectures
AutoML for Neuromorphic Computing and Application-Driven Co-Design: Asynchronous, Massively Parallel Optimization of Spiking Architectures
Ballistic Asynchronous Reversible Computing in Superconducting Circuits
Demonstrating Quantum Advantage in Hybrid Quantum Neural Networks for Model Capacity36 Muhammad Kashif (Hamad Bin Khalifa University, Qatar) and Saif Al-Kuwari (Hamad Bin Khalifa University, Qatar)

Equivalence of Coupled Parametric Oscillator Dynamics to Lagrange Multiplier Optimization 45 Sri Krishna Vadlamani (Massachusetts Institute of Technology), Tianyao Patrick Xiao (Sandia National Laboratories), and Eli Yablonovitch (University of California, Berkeley)
Optimized Telecloning Circuits: Theory and Practice of Nine NISQ Clones
Probabilistic Neural Circuits Leveraging AI-Enhanced Codesign for Random Number Generation 57 Suma George Cardwell (Sandia National Laboratories), Catherine Schuman (University of Tennessee, Knoxville), J. Darby Smith (Sandia National Laboratories), Karan Patel (University of Tennessee, Knoxville), Jaesuk Kwon (University of Texas, USA), Samuel Liu (University of Texas, USA), Christopher Allemang (Sandia National Laboratories), Shashank Misra (Sandia National Laboratories), Jean Anne Incorvia (University of Texas, USA), and James B. Aimone (Sandia National Laboratories)
Quancorde: Boosting Fidelity with Quantum Canary Ordered Diverse Ensembles
Rebooting Quantum Computing
Solving Quadratic Unconstrained Binary Optimization with Collaborative Spiking Neural Networks
Institute of Technology)
TCAmMCogniGron: Energy Efficient Memristor-Based TCAM for Match-Action Processing
Virtual Neuron: A Neuromorphic Approach for Encoding Numbers 100 Prasanna Date (Oak Ridge National Laboratory, USA), Shruti Kulkarni (Oak Ridge National Laboratory, USA), Aaron Young (Oak Ridge National Laboratory, USA), Catherine Schuman (University of Tennessee at Knoxville, USA), Thomas Potok (Oak Ridge National Laboratory, USA), and Jeffrey Vetter (Oak Ridge National Laboratory, USA)
Author Index