2019 IEEE Space Computing Conference (SCC 2019)

Pasadena, California, USA 30 July – 1 August 2019



IEEE Catalog Number:

ISBN:

CFP19U24-POD 978-1-7281-3195-5

Copyright © 2019 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:
 CFP19U24-POD

 ISBN (Print-On-Demand):
 978-1-7281-3195-5

 ISBN (Online):
 978-1-7281-3194-8

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



2019 IEEE Space Computing Conference (SCC) SCC 2019

Table of Contents

Avionics - Computing Architectures Exploration of Energy Consumption Using the Intel Running Average Power Limit Interface .1..... Jose Garcia (Texas Advanced Computing Center) **Special Topics** Cybersecurity Risk Assessment for Space Systems .1.1..... Ly Vessels (Honeywell), Daniel Johnson (Honeywell), and Kenneth Heffner (Honeywell) **Avionics - Component Technologies** Impact of On-Orbit Data Compression on Signal-to-Noise Ratio for Dim Target Detection 20. Judith Brewer (University of New Mexico), Jim Aarestad (University of New Mexico), Andrew Pineda (Air Force Research Laboratory), and Jesse Mee (Air Force Research Laboratory) Neutron Radiation Testing of Fault Tolerant RISC-V Soft Processor on Xilinx SRAM-based FPGAs 25...... Andrew Elbert Wilson (Brigham Young University) and Michael Wirthlin (Brigham Young University) **Neural Inspired Computing - Hardware** A Resurgence in Neuromorphic Architectures Enabling Remote Sensing Computation 33..... Craig Vineyard (Sandia National Laboratories), William Severa (Sandia National Laboratories), Matthew Kagie (Sandia National Laboratories), Andrew Scholand (Sandia National Laboratories), and Park Hays (Sandia National Laboratories) ReCoN: A Reconfigurable CNN Acceleration Framework for Hybrid Semantic Segmentation on Hybrid SoCs for Space Applications .41...... Sebastian Sabogal (University of Pittsburgh, NSF SHREC Center), Alan George (University of Pittsburgh, NSF SHREC Center), and Gary Crum (NASA Goddard Space Flight Center)

PositNN Framework: Tapered Precision Deep Learning Inference for the Edge .53. Hamed F. Langroudi (Rochester Institute of Technology), Zachariah Carmichael (Rochester Institute of Technology), John L. Gustafson (National University of Singapore), and Dhireesha Kudithipudi (Rochester Institute of Technology)
The Insect Brain as a Model System for Low Power Electronics and Edge Processing Applications .60
Avionics - Fault Tolerance in Space
Design and Validation Architecture of the Dream Chaser® Fault Tolerant Flight Computer .6.7
System Architecture and Software Impacts on Fault Tolerant Avionics 77. Mitch Fletcher (Arrowhead System Engineering)
Author Index 87