Subodha Charles

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Interests

SoC Security ⊕ Energy Aware Computing ⊕ Reconfigurable Architectures

Education

University of Florida — Gainesville, FL, USA
Doctor of Philosophy, Computer Science — August 2016 - Present
Current GPA: 4.0/4.0

University of Moratuwa — Colombo, Sri Lanka
Bachelor of Science, Electronic and Telecommunication Engineering — September 2015
GPA: 3.92/4.20

Work Experience

August 2016 - Present, Gainesville, FL, USA
Research Assistant
Embedded Systems Lab, University of Florida
Supervisor: Prof. Prabhat Mishra
System-on-Chip architecture optimization with 4-way interoperability constraints - security, power, performance and area.

February 2013 - Present, Colombo, Sri Lanka
Director
Alta Vision (Pvt) Ltd.
Co-founder, Member of board - www.altavision.lk

May 2017 - August 2017, Portland, OR, USA
Graduate Technical Intern
Strategic CAD Labs, Intel Corporation
Power and performance validation and debug of power control algorithms.

January 2016 - July 2016, Colombo, Sri Lanka
Lecturer
University of Moratuwa
Worked as a Lecturer on contract basis tutoring and handling multiple courses.

November 2013 - May 2014, Colombo, Sri Lanka
Trainee Associate Electronics Engineer
Zone24x7 (Pvt) Ltd.
Developed an optical character recognition tool for handwritten and printed pages.

Honors and Awards

2019 IEEE MGA Young Professionals (YP) Achievement Award for substantial contributions to Students/YPs.
2019 Harris Corporation Communication Graduate Fellowship for outstanding PhD students in CISE, UF.
2018 Travel grant from National Science Foundation (NSF) to attend IGSC 2018.
2016 Received full assistantship for PhD program in Computer Science (CISE) from University of Florida.
2015 IEEE "Larry K. Wilson" award for the best student volunteer of Asia-Pacific Region.
2010-2014 "Mahapola" merit scholarship to pursue undergraduate studies by the government of Sri Lanka.
2009 Dialog Axiata merit scholarship for top performance in Advanced Level examination in Sri Lanka.

Provisional Patents

[1] Lightweight and Trust-Aware Routing in NoC based SoC Architectures, **S. Charles**, P. Mishra, *PP No. 62/878,147*
[2] Lightweight Encryption and Anonymous Routing in NoC based SoCs, **S. Charles**, P. Mishra, *PP No. 62/879,657*
[3] Real-Time Detection and Localization of DoS Attacks in NoC based SoCs, **S. Charles**, Y. Lyu, P. Mishra, *PP No. 62/868,258*
[4] Securing System-on-Chip using Incremental Cryptography **S. Charles**, Y. Lyu, P. Mishra, *PP No. 62/874,187*
[5] Reconfigurable Network-on-Chip Security Architecture. **S. Charles**, P. Mishra, *PP No. 62/937,858*

Publications

[6] Securing Network-on-Chip Using Incremental Cryptography.
S. Charles, P. Mishra, *IEEE Computer Society Annual Symposium on VLSI (ISVLSI), 2020*
[7] Lightweight and Trust-aware Routing in NoC-based SoCs.
S. Charles, P. Mishra, *IEEE Computer Society Annual Symposium on VLSI (ISVLSI), 2020*
[8] Real-time Detection and Localization of Distributed DoS Attacks in NoC-based SoCs
S. Charles, Y. Lyu, P. Mishra, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), 2020*
[9] Lightweight Anonymous Routing in NoC based SoCs
S. Charles, M. Logan, P. Mishra, *Design, Automation and Test in Europe (DATE), 2020*
[10] Efficient Cache Reconfiguration using Machine Learning in NoC-based Many-Core CMPs.
S. Charles, A. Ahmed, U. Ogras, P. Mishra, *ACM Transactions on Design Automation of Electronic Systems (TODAES), 2019*
[11] Real-time Detection and Localization of DoS Attacks in NoC based SoCs.
S. Charles, Y. Lyu, P. Mishra, *Design, Automation and Test in Europe (DATE), 2019*
[12] Proactive Thermal Management using Memory-based Computing in Multicore Architectures.
S. Charles, H. Hajimiri, P. Mishra, *International Green and Sustainable Computing Conference (IGSC), 2018*
[13] Exploration of Memory Cluster Modes in Directory-Based Many-Core CMPs.
S. Charles, C. A. Patil, U. Ogras, P. Mishra, *IEEE/ACM International Symposium on Networks-on-chip (NOCS) 2018*
[14] Real Time Human Movement Mapping to Virtual Environment.
S. Charles *IEEE Region 10 Symposium (TENSYMP), 2016*

Book Chapters

[15] Subodha Charles, Prabhat Mishra, "Network-on-Chip Validation and Debug"
Prabhat Mishra and Farimah Farahmandi (Editors) **Post-Silicon Validation and Debug** ISBN: 978-3-319-98115-4, *Springer,* 2018

Other Selected Projects

- A Pressure Ulcer Management System Using Accelerometer Sensing and Caregiver Notification
  - A monitoring system to prevent pressure ulcers from being developed on spinal cord injured/bedridden patients. Designed and developed sensor hardware, firmware, a monitoring algorithm and a cloud based storage and monitoring system.
- ABU Robocon 2012
  - A large scale robot system of three robots developed using Microcontrollers (ATmega 2560) to work as a team and collect objects from a tower within a limited time period with high precision. Represented Sri Lanka as the Team Leader and contributed in designing the robot system, electronics and software.

Teaching Experience

- Embedded Systems, University of Florida — Spring 2019
- Advanced Data Structures, University of Florida — Fall 2018
- Computer Organization, University of Florida — Fall 2016, Spring 2017, Fall 2017, Spring 2018
- Digital Electronics, University of Moratuwa — Summer 2015
- Robotics Design and Competition, University of Moratuwa — Spring 2015

Professional Affiliations and Activities

- Reviewer, Design Automation Conference (DAC) — 2018, 2019, 2020
- Reviewer, International Conference On Computer Aided Design (ICCAD) — 2019
- Member of IEEE (Institute of Electrical and Electronics Engineers) — 2012 - Present
  - Regional Student Representative, IEEE Region 3 — Dec. 2019 - Present
  - Vice Chair, Education & Awards of IEEE Entreprenuership Steering Committee — Apr. 2019 - Present
  - Vice Chair, Social Impact of IEEE Entreprenuership Steering Committee — Apr. 2018 - Mar. 2019
  - Student activities committee chair of IEEE Sri Lanka Section — 2016-2017
  - Secretary of IEEE Asia Pacific congress, Colombo, Sri Lanka — 2015
  - Sectional student representative of IEEE Sri Lanka Section — 2014-2015

Skills

Programming Languages: C/C++, Python, MATLAB
EDA Tools: gem5, McPAT, SimpleScalar
Sound background in algorithms and mathematical modelling