

Subodha CHARLES

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EDUCATION

Ph.D. in Computer Science

University of Florida

Dissertation: Design of Secure and Trustworthy Network-on-Chip Architectures

Advisor: [Dr. Prabhat Mishra](#), GPA: 4.0/4.0

Gainesville, FL, USA

December 2020

B.Sc. Eng (Hons) in Electronic & Telecommunication

University of Moratuwa

GPA: 3.92/4.20

Colombo, Sri Lanka

September 2015

WORK EXPERIENCE

January 2021 - Present

Colombo, Sri Lanka

Senior Lecturer

Dept. of Electronic & Telecommunication Engineering, University of Moratuwa

Teaching: EN3240 - Embedded Systems Engineering, EN4720 - Security in Cyber-Physical Systems, EN3250 - Internet of Things (Co-instructor), EN4053 - Digital Communications II (Co-instructor), EN2852 - Applied Electronics (Co-instructor).

Research: Hardware Security & Trust, Embedded Systems, Computer Architecture.

February 2013 - Present

Colombo, Sri Lanka

Group Chairman

Pearl Cluster

Co-founder, Member of board - www.pearlcluster.lk

August 2016 - December 2020

Gainesville, FL, USA

Research Assistant

Embedded Systems Lab, University of Florida

Researched on system-on-chip architecture optimization with 4-way interoperability constraints - security, power, performance and area.

May 2017 - August 2017

Portland, OR, USA

Graduate Technical Intern

Strategic CAD Labs, Intel Corporation

Worked on Power and performance validation of power control algorithms.

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

2020 Outstanding Achievement Award 2020 from the Herbert Wertheim College of Engineering, UF.

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.

2010-2013 Dialog Axiata merit scholarship for top performance in Advanced Level examination in Sri Lanka.

BOOKS

[1] P. Mishra and S. Charles (Editors), [Network-on-Chip Security and Privacy](#), Springer, 2021.

PATENTS AND COPYRIGHTS

[2] P. Mishra, S. Charles and V. Bindschaedler, [Securing On-Chip Communication using Digital Watermarking](#), U.S. Non-Provisional Patent Application Serial No. 17/525,176, filed November 12, 2021

[3] P. Mishra, H. Weerasena and S. Charles, [Securing On-Chip Communication using Chaffing and Winnowing with All-or-Nothing Transform](#), U.S. Provisional Patent Application Serial No. 63/275,552, filed November 4, 2021

- [4] P. Mishra and S. Charles, **Reconfigurable Network-on-Chip Security Architecture**, *U.S. Utility Patent Application Serial No. 17/092,703*, filed November 9, 2020.
- [5] S. Charles and P. Mishra, **Lightweight and Trust-aware Routing in NoC based SoC Architectures**, *U.S. Utility Patent Application Serial No. 16/934,612*, filed July 21, 2020.
- [6] P. Mishra, S. Charles and Y. Lyu, **Securing System-on-Chip using Incremental Cryptography**, *U.S. Non-Provisional Patent Application Serial No. 16/915,021*, filed June 29, 2020.
- [7] S. Charles and P. Mishra, **Lightweight Encryption and Anonymous Routing in NoC based SoCs**, *U.S. Utility Patent Application Serial No. 16/937,882* filed July 24, 2020.
- [8] P. Mishra, S. Charles and Y. Lyu, **Real-Time Detection and Localization of DoS Attacks in NoC based SoC Architectures**, *U.S. Utility Patent Application Serial No. 16/913,850*, filed June 26, 2020.

PUBLICATIONS

- [9] S. Charles, V. Bindschaedler, and P. Mishra, **Digital Watermarking for Detecting Malicious Intellectual Property Cores in NoC Architectures**, *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, 2022.
- [10] H. Witharana, Y. Lyu, S. Charles and P. Mishra, **A Survey on Assertion-based Hardware Verification**, *ACM Computing Surveys (CSUR)*, 2022.
- [11] H. Weerasena, S. Charles and P. Mishra, **Lightweight Encryption using Chaffing and Winnowing with All-or-Nothing Transform for Network-on-Chip Architectures**, *IEEE International Symposium on Hardware Oriented Security and Trust (HOST)*, Washington DC, USA, December 12-15, 2021.
- [12] C. Sudusinghe, S. Charles and P. Mishra, **Denial-of-Service Attack Detection using Machine Learning in Network-on-Chip Architectures**, *International Symposium on Networks-on-Chip (NOCS)*, Virtual, October 8-15, 2021.
- [13] S. Charles and P. Mishra, **A Survey of Network-on-Chip Security Attacks and Countermeasures**, *ACM Computing Surveys (CSUR)*, 2021.
- [14] Z. Pan, J. Sheldon, C. Sudusinghe, S. Charles and P. Mishra, **Hardware-Assisted Malware Detection using Machine Learning**, *Design Automation and Test in Europe (DATE)*, Grenoble, France, February 1-5, 2021.
- [15] S. Charles and P. Mishra, **Reconfigurable Network-on-Chip Security Architecture**, *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, 2020.
- [16] S. Charles, Y. Lyu and P. Mishra, **Real-time Detection and Localization of Distributed DoS Attacks in NoC based SoCs**, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, 2020.
- [17] S. Charles and P. Mishra, **Lightweight and Trust-aware Routing in NoC Based SoCs**, *IEEE Annual Symposium on VLSI (ISVLSI)*, Limassol, Cyprus, July 6-8, 2020.
- [18] S. Charles and P. Mishra, **Securing Network-on-Chip Using Incremental Cryptography**, *IEEE Annual Symposium on VLSI (ISVLSI)*, Limassol, Cyprus, July 6-8, 2020.
- [19] S. Charles, M. Logan and P. Mishra, **Lightweight Anonymous Routing in NoC based SoCs**, *Design Automation and Test in Europe (DATE)*, Grenoble, France, March 9 - 13, 2020.
- [20] S. Charles, A. Ahmed, U. Ogras and P. Mishra, **Efficient Cache Reconfiguration using Machine Learning in NoC-based Many-Core CMPs**, *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, 2019.
- [21] S. Charles, Y. Lyu, P. Mishra, **Real-time Detection and Localization of DoS Attacks in NoC based SoCs**, *Design Automation and Test in Europe (DATE)*, Florence, Italy, March 25 - 29, 2019.
- [22] S. Charles, H. Hajimiri and P. Mishra, **Proactive Thermal Management using Memory-based Computing in Multicore Architectures**, *Intl. Green and Sustainable Computing Conference (IGSC)*, Pittsburgh, Pennsylvania, USA, October 22-24, 2018.
- [23] S. Charles, C. Patil, U. Ogras and P. Mishra, **Exploration of Memory and Cluster Modes in Directory-Based Many-Core CMPs**, *IEEE/ACM International Symposium on Networks-on-Chip (NOCS)*, Torino, Italy, October 4-5, 2018.

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

- Reviewer, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD) 2021
- Reviewer, ACM Transactions on Embedded Computing Systems (TECS) 2021
- Reviewer, Design Automation Conference (DAC) 2018, 2019, 2020
- Reviewer, International Conference On Computer Aided Design (ICCAD) 2019, 2020
- Member of IEEE (Institute of Electrical and Electronics Engineers) 2012 - Present
 - Vice Chair, Membership of IEEE MGA Student Activities Committee Jan. 2022 - Present
 - Member, Tools Working Group of IEEE Industry Engagement Committee Jan. 2022 - Present
 - Member, Tech Transfer Team of IEEE Entrepreneurship Steering Committee Jan. 2022 - Present
 - Member of IEEE MGA Student Activities Committee Jan. 2021 - Jan. 2022
 - Member-at-large of IEEE Entrepreneurship Steering Committee Jan. 2021 - Jan. 2022
 - Secretary of IEEE Sri Lanka Section Feb. 2021 - Feb. 2022
 - Regional Student Representative, IEEE Region 3 Dec. 2019 - Dec. 2020