DR. NAFISA NOOR [NANR]

Assistant Professor & Graduate Coordinator

PhD – Electrical Engineering, University of Connecticut, Storrs, CT, USA

M.S. – Electrical Engineering, University of Connecticut, Storrs, CT, USA

B.Sc. – Electrical and Electronic Engineering, Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

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Research Areas

- Semiconductor Device and Technology
- Modeling and Simulation

Research Interests

Modeling of phase change memory (PCM) & memristive nanodevices

Compact circuit modeling of emerging memory nanodevices

Modeling of interconnect network circuitry

Stochastic circuits, systems, devices, and materials for hardware security applications

Automatized instrumentation & measurements

Teaching

- EEE 141 Electrical Circuits I
- EEE 141L Electrical Circuits I Lab
- EEE 211 Digital Logic Design

▪ EEE 211L Digital Logic Design Lab

▪ EEE 299 Junior Design Project I

▪ EEE311/ ETE311 Analog Electronics II

▪ EEE 311L/ETE 311L Analog Electronics II Lab

▪ EEE 410 Semiconductor Devices and Technology

▪ EEE 415 CMOS Analog Circuit Design

▪ EEE 491 Special Topics

▪ CSE 498/EEE 498/ETE 498 Internship/Co-op/Directed Research

▪ CSE499A/EEE499A/ETE499A – Senior Design I

▪ CSE499B/EEE499B/ETE499B – Senior Design II

▪ EEE 513 Nanotechnology

▪ ETE 544 Introduction to Nanotechnologies

Selected Publications

Journals

▪ Sadid Muneer, Muhammad Aminul Haque Chowdhury, Md Kabiruzzaman, Shafat Shahnewaz, Nafisa Noor, Mainul Hossain, “Thermal Confinement by Monolayer MoS2 for Reduced RESET Current in Phase Change Memory Pillar Cells,” ACS Applied Electronic Materials, 2024

▪ Nafisa Noor, Sadid Muneer, Raihan Sayeed Khan, Anna Gorbenko, Lhacene Adnane, Md Tashfiq Bin Kashem, Jake Scoggin, Faruk Dirisaglik, Adam Cywar, Ali Gokirmak, Helena Silva, “Reset Variability in Phase Change Memory for Hardware Security Applications,” IEEE Transactions on Nanotechnology, 2020

▪ Nafisa Noor, Sadid Muneer, Raihan Sayeed Khan, Anna Gorbenko, Helena Silva, “Enhancing Programming Variability in Multi-Bit Phase Change Memory Cells for Security,” IEEE Transactions on Nanotechnology, 2020

▪ Nafisa Noor, Sadid Muneer, Raihan Sayeed Khan, Anna Gorbenko, and Helena Silva, “Amorphized length and variability in phase-change memory line cells,” Beilstein Journal of Nanotechnology, 2020

▪ Nafisa Noor, Venkata Manthina, Kadir Cil, Lhacene Adnane, Alexander G. Agrios, Ali

Gokirmak, Helena Silva, “Atmospheric pressure microplasmas in ZnO nanoforests under high voltage stress,” AIP Advances, 2015

▪ Nafisa Noor, Luca Lucera, Thomas Capuano, Venkata Manthina, Alexander G Agrios, Helena Silva, Ali Gokirmak, “Blue and white light emission from zinc oxide nanoforests,” Beilstein Journal of Nanotechnology, 2015

Conference Papers

▪ Nafisa Noor, Helena Silva, “Optical Characterization of ZnO Nanoforest for Hardware Security Applications,” 2019 IEEE 19th International Conference on Nanotechnology (IEEE-NANO), Macao, China, 2019

▪ Nafisa Noor, Raihan Sayeed Khan, Sadid Muneer, Helena Silva, “Tamper Evidence of SEM Imaging Attack in Phase Change Memory Nanodevices,” 2019 IEEE 19th International Conference on Nanotechnology (IEEE-NANO), Macao, China, 2019

▪ Anna Gorbenko, Nafisa Noor, Sadid Muneer, Raihan Sayeed Khan, Faruk Dirisaglik, Adam Cywar, Bicky Shakya, Domenic Forte, Marten van Dijk, Ali Gokirmak, Helena Silva, “Resistance Drift and Crystallization in Suspended and On-oxide Phase Change Memory Line Cells,” 2019 IEEE 19th International Conference on Nanotechnology (IEEE NANO), Macao, China, 2019

▪ Raihan Sayeed Khan, Nafisa Noor, Chenglu Jin, Sadid Muneer, Faruk Dirisaglik, Adam Cywar, Phuong Ha Nguyen, Marten van Dijk, Ali Gokirmak, Helena Silva, “Exploiting lithography limits for hardware security applications,” 2019 IEEE 19th International Conference on Nanotechnology (IEEE-NANO), Macao, China, 2019

▪ Nafisa Noor, Sadid Muneer, “Concentrating solar power (CSP) and its prospect in Bangladesh,” 2009 IEEE 1st International Conference on the Developements in Renewable Energy Technology (ICDRET), 2009

▪ Nafisa Noor, “Invited Talk: Phase Change Memory Nanodevices for Secure Hardwares,” 2nd International Conference on Robotics, Electrical and Signal Processing Techniques (ICREST’21), 5-7 January 2021, Dhaka, Bangladesh, 2021

▪ Md Tashfiq Bin Kashem, Sadid Muneer, Nafisa Noor, Jake Scoggin, Helena Silva, and Ali Gokirmak, “Computational Analysis of Complex Amorphization/Crystallization

Dynamics in Large Phase Change Memory Devices," 2019 Materials Research Society (MRS) Spring Meeting & Exhibit, Phoenix, AZ, USA, 2019

▪ ABM Hasan Talukder, Raihan Sayeed Khan, Kimberly Nguyen, Madison Nadolny, Nafisa Noor, Faruk Dirisaglik, Adam Cywar, Sadid Muneer, Helena Silva, and Ali Gokirmak, "Investigation of Resistance Drift in Ge2Sb2Te5 Phase Change Memory Line Cells at Low Temperatures—Contributions of Charge Trapping," 2019 Materials Research Society (MRS) Spring Meeting & Exhibit, Phoenix, AZ, USA, 2019

▪ Nafisa Noor, Sadid Muneer, Raihan Sayeed Khan, Ali Gokirmak, and Helena Silva, "Enhanced Reset Variability in Phase Change Memory for Hardware Security Applications," 2019 American Physical Society (APS) March Meeting, Boston, MA, USA, 2019

▪ Helena Silva, Nafisa Noor, Shalini Tripathi, and C. Barry Carter, "Resistance drift of metastable amorphous and crystalline fcc GeSbTe memory devices," 2019 American Physical Society (APS) March Meeting, Boston, MA, USA, 2019

▪ Raihan Sayeed Khan, Sadid Muneer, Nafisa Noor, Helena Silva, and Ali Gokirmak, "Evidence of Charge Trapping Giving Rise to Resistance Drift of Metastable Amorphous Ge2Sb2Te5," 2019 American Physical Society (APS) March Meeting, Boston, MA, USA, 2019

▪ Shalini Tripathi, Matthew Janish, Nafisa Noor, Katherine Jungjohann, Doug Pete, Paul Kotula, Helena Silva, C. Barry Carter, "In Situ Characterization of Phase-Change Materials (PCMs)," 2018 Materials Research Society (MRS) Fall Meeting & Exhibit, Boston, MA, USA, 2018

▪ Nafisa Noor, Venkata Manthina, Sadid Muneer, Alexander Agrios, Ali Gokirmak, and Helena Silva, "ZnO Nanoforest Optical PUFs," 2018 Materials Research Society (MRS) Fall Meeting & Exhibit, Boston, MA, USA, 2018

▪ Anna Gorbenko, Nafisa Noor, Sadid Muneer, Raihan Sayeed Khan, Faruk Dirisaglik, Adam Cywar, Yu Zhu, Ali Gokirmak, Helena Silva, "Resistance Drift in Suspended and On Oxide Gb2Se2Te5 Phase Change Memory Line Cells," 2018 Materials Research Society (MRS) Spring Meeting & Exhibit, Phoenix, AZ, USA, 2018

▪ Nafisa Noor, Lindsay Sullivan, Raihan Sayeed Khan, Sadid Muneer, Faruk Dirisaglik, Adam

Cywar, Yu Zhu, Chung Lam, Ali Gokirmak, and Helena Silva, “Variability of Amorphized Length in Phase Change Memory (PCM) Line Cells,” 2018 Materials Research Society (MRS) Spring Meeting & Exhibit, Phoenix, AZ, USA, 2018

▪ Nafisa Noor, Sadid Muneer, Lhacene Adnane, Raihan Sayeed Khan, Anna Gorbenko, Faruk Dirisaglik, Adam Cywar, Chung Lam, Yu Zhu, Ali Gokirmak, Helena Silva, “Utilizing Programming Variability in Phase Change Memory Cells for Security,” 2017 Materials Research Society (MRS) Fall Meeting & Exhibit, Boston, MA, USA, 2017

▪ Raihan Sayeed Khan, Nafisa Noor, Aaron Ciardullo, Sadid Muneer, Lhacene Adnane, Faruk Dirisaglik, Adam Cywar, Chung Lam, Yu Zhu, Helena Silva, Ali Gokirmak, “A Study on Stochasticity in Hexagonal Close Packed Ge2Sb2Te5 Nanowires for Possible Physical Unclonable Function (PUF) Implementation,” 2017 Materials Research Society (MRS) Spring Meeting & Exhibit, Phoenix, AZ, USA, 2017

▪ Nafisa Noor, Raihan Sayeed Khan, Sadid Muneer, Lhacene Adnane, Ryanne Ramadan, Faruk Dirisaglik, Adam Cywar, Chung Lam, Yu Zhu, Ali Gokirmak, Helena Silva, “Short and Long Time Resistance Drift Measurement in Intermediate States of Ge2Sb2Te5 Phase Change Memory Line Cells,” 2017 Materials Research Society (MRS) Spring Meeting & Exhibit, Phoenix, AZ, USA, 2017

▪ Raihan Sayeed Khan, Nafisa Noor, Aaron Ciardullo, Sadid Muneer, Lhacene Adnane, Faruk Dirisaglik, Adam Cywar, Chung Lam, Yu Zhu, Helena Silva, Ali Gokirmak, “A Study on Stochasticity in Hexagonal Close Packed Ge2Sb2Te5 Nanowires,” 2016 International Semiconductor Device Research Symposium (ISDRS), Bethesda, MD, USA, 2016

▪ Nafisa Noor, Sadid Muneer, Lhacene Adnane, Raihan Sayeed Khan, Ryanne Ramadan, Faruk Dirisaglik, Adam Cywar, Chung Lam, Yu Zhu, Helena Silva, Ali Gokirmak, “Pulse mode Electrical Resistance Trimming of Ge2Sb2Te5 Phase Change Memory (PCM) Line Cells,” 2016 International Semiconductor Device Research Symposium (ISDRS), Bethesda, MD, USA, 2016

▪ Nafisa Noor, Sadid Muneer, Lindsay Sullivan, Kadir Cil, Faruk Dirisaglik, Adam Cywar, Chung Lam, Yu Zhu, Ali Gokirmak, Helena Silva, “Retention Time of Partially Amorphized Ge2Sb2Te5 Phase Change Memory Cell,” 2016 Connecticut Symposium on

Microelectronics & Optoelectronics (CMOC), Storrs, CT, USA, 2016

▪ Nafisa Noor, Kadir Cil, Lindsay Sullivan, Sadid Muneer, Faruk Dirisaglik, Adam Cywar, Chung Lam, Yu Zhu, Ali Gokirmak, Helena Silva, “An experimental study on waveform engineering for Ge2Sb2Te5 phase change memory cells,” 2015 MRS Fall Meeting & Exhibit, At Boston, Massachusetts, USA, 2015

▪ Nafisa Noor, Venkata Manthina, Kadir Cil, Alexander G. Agrios, Helena Silva, Ali Gokirmak, “Blue and White Light Emission from ZnO Nanoforest Microplasmas,” 24th Annual CMOC Symposium, Bridgeport, CT, USA, 2015

▪ Nafisa Noor, Venkata Manthina, Helena Silva, Alexander G. Agrios, Ali Gokirmak, “Blue and White Light Emission from ZnO Nanoforests,” 2014 Materials Research Society Fall Meeting and Exhibit, Boston, MA, USA, 2014

▪ Nafisa Noor, Thomas Capuano, Venkata Manthina, Helena Silva, Alexander G. Agrios, Ali Gokirmak, “Plasma in a ZnO Nano-Forest: Electrical Discharge, and Blue and White Light Emission,” 8th International Workshop on Zinc Oxide and Related Materials (IWZnO 2014), Niagara Fall, ON, Canada, 2014

▪ Sadid Muneer, Nafisa Noor, Yu Zhu, Chung Lam, Ali Gokirmak, Helena Silva, “Electrical Resistivity and Thermal Conductivity Extraction for GST Micro-bridges,” 2013 Materials Research Society (MRS) Spring Meeting & Exhibit, San Francisco, CA, USA, 2013

Book Chapters

▪ Nafisa Noor, Helena Silva, “Phase Change Memory for Physical Unclonable Functions,” Springer Nature Singapore, 2020

▪ Raihan Sayeed Khan, Nafisa Noor, Chenglu Jin, Jake Scoggin, Zachary Woods, Sadid Muneer, Aaron Ciardullo, PHUONG HA NGUYEN, ALI GOKIRMAK, Marten van Dijk, Helena Silva, “Phase Change Memory and Its Applications in Hardware Security,” CRC Press, 2017

Others

▪ Nafisa Noor, “Webinar: Phase Change Memory Nanodevices,” IEEE WIE Affinity Group, University of Dhaka, 2021

▪ Shalini Tripathi, Matthew Janish, Nafisa Noor, Paul G Kotula, Douglas V Pete, Katherine

Leigh Jungjohann, Helena Silva, Clive Barry Carter, “PCM Materials & Devices: In-Situ TEM Imaging,” CINT User's Meeting, Sandia National Lab.(SNL-NM), Albuquerque, NM, USA, 2018

Research Projects & Grants

OR-NSU CTRG 2020-2021 (BDT 5,00,000)

OR-NSU CTRG 2021-2022 (BDT 5,00,000)

UIU IAR 2023-2024 & OR-NSU (BDT 4,50,000)

Professional Activity

Current affiliation

Assistant Professor, Department of Electrical & Computer Engineering, North South University, Dhaka, Bangladesh, September 2019 to present

Research Coordinator, School of Engineering & Physical Sciences (SEPS), June 2024 to present

Previous affiliations:

Graduate Research/Teaching Assistant, Department of Electrical & Computer Engineering, University of Connecticut, Storrs, CT, USA, August 2012 to March 2019

Lecturer, Department of Electrical & Electronic Engineering, Ahsanullah University of Science & Technology (AUST), Dhaka, Bangladesh, October 2008 to July 2011

System Engineer, Core Network Planning Department, GrameenPhone Limited, Dhaka, Bangladesh, June 2007 to September 2008