2022 IEEE Microelectronic Design and Test Symposium

May 23 through May 26, 2022

The 31th IEEE Microelectronics Design & Test Symposium (MDTS, formerly known as NATW) provides an annual world forum for academia and industry. University Faculty/student researchers and industry engineers discuss latest advances in microelectronics, share their visions in modern microelectronic technologies and foster academy-industry collaboration. The four-day symposium features keynote and invited talks, tutorial speakers on the topic of 2-D Nanoelectronics and a panel "Closing the Collaboration Gap Between Industry and Academia". MDTS'2022 is being held as a virtual event from 10AM to 3PM starting Tuesday May 23 and daily through Thursday May 26.

Message from the chairs: Link

MDTS 2022 is sponsored by IEEE Schenectady Section and IEEE Region 1, and is supported by IBM Corp., Siemens EDA, Advantest America, AdamsIP, Cadence Design Systems, Green Mountain Semiconductor, OnSemiconductor, and the SWTest Conference.

Monday, May 23
Session 1 : Tutorial: 2-D Nanoelectronics
10:00 am – 10:10am Welcome Address: Kelly Ockunzzi General Chair
Tutorial Chair: Krishna Chakravadhanula Tutorial Co-chair: Huamin Li
10:10 am – 10:15 am Tutorial Introduction: flyer
10:15 am – 11:00 am ***"2D Transistors: Promises, Problems and Prospects"*** presentation Speaker: Xiangfeng Duan
11:00 am – 11:45 am ***"2D Nanoelectronics: New Materials and Devices for Edge Intelligence"*** presentation Speaker: Tomas Palacios
11:45 pm - 12:45 pm Lunch
Session 2 : Tutorial Continued, Keynote
12:45 am – 1:30 pm ***"Sensing, Computing, Storage, and Hardware Security Devices based on Two-dimensional (2D) Materials"*** presentation Speaker: Saptarshi Das Abstract:
1:30 pm - 1:40 pm Break
1:40 pm - 1:45 pm Keynote Introduction
1:45 pm – 2:45 pm - *"**Industry Trends as Globalized Supply Chains Restructure"*** Speaker: Joseph Fitzgerald, Garett Wyatt, Deloitte Consulting LLC flyer, presentation Abstract:

Tuesday, May 24
Session 3: Invited Speaker
10:00 am – 10:05 am Welcome: Kelly Ockunzzi General Chair
10:05 am – 10:10 am Speaker introduction: Eugene Atwood
10:10 am – 11:55 am ***"On-chip analysis of fluid flow for applications in carbon dioxide trapping"*** Speaker: Jaione Tirapu Azpiroz IBM flyer, presentation
Break 10:55 am- 11:00 am

2022 IEEE Microelectronic Design and Test Symposium

Student Paper Session 1a
Program Chair Introduction: Uma Srinivasan
Session Chair: Uma Srinivasan Session Co-chair: Ted Cooley
11:00 am – 11:20: ***'Ge/GaAs Hetero-structured n-p-n Transistor'*** Speaker: Dhawal N Asthana UMass Lowell, Paper, presentation Biography:
11:20 am – 11:40: ***"Autonomous Navigation System from Simultaneous Localization and Mapping"*** Speaker: Micheal Caracciolo, Clarkson University Paper, presentation Biography:
11:40 am – Noon: ***"Enhanced DFT for Fortuitous Detection of Transition Faults During Scan Shift"*** Speaker: Hui Jiang affiliation Paper, presentation Biography
Noon – 1:00 pm Lunch
Student Paper Session 1b
Session Chair: Session Co-chair:
1:00 pm – 1:20 pm: ***"Modeling and Design of Low Threshold Voltage D-mode GaN HEMT"*** Speaker: Dhawal N Asthana, Umass Lowell Paper, presentation Biography:
1:20 pm – 1:40 pm: ***"Impact of Switching Variability, Memory Window, and Temperature on Vector Matrix Operations Using 65nm CMOS Integrated Hafnium Dioxide-based ReRAM Devices"*** Speaker: Maximilian Liehr, College of Nanoscale Science &Engineering SUNY Polytechnic Institute Paper, presentation Biography:
1:40 pm – 2:00 pm: ***"27/38 GHz Dual-Band Subsampling PLL Design with Automated Frequency Calibration"*** Speaker: Wenzhe Chen, University of Vermont Paper, presentation Biography:
Break 2:00 pm- 2:05 pm
Student Paper Session 1c
Session Chair: Session Co-chair:
2:05 pm – 2:25 pm: ***"Design and Testing Considerations for a Multi-State Magnetic Memory Device"*** Speaker: Wolfgang Hokenmaier, Green Mountain Semiconductor, Inc. Paper, presentation Biography:
2:05 pm – 2:25 pm: ***"Wide Range Variable Capacitance Controlled by Electrostatic MEMs"*** Speaker: Sam Mil'shtein, UMass Lowell Paper, presentation Biography
2:25 pm – 3:05 pm: ***"iBUG: AI Enabled IoT Sensing Platform for Real-time Environmental Monitoring"*** Speaker: Mdshaad Mahmud, University of New Hampshiret Paper, presentation Biography

Wednesday, May 25

Session 4

10:00 am – 10:05 am Welcome: Kelly Ockunzzi General Chair

Session Chair:

10:05 am – 10:50 am Invited Speaker: ***"Nanotechnologies enabling future on-chip ESD protection"***
Speaker: Albert Wang affiliation
flyer, presentation
Abstract:
Biography:

10:50 am - 10:55 am Break

10:55 am -12:10 pm **Panel**

Closing the Collaboration Gap Between Industry and Academia

Panel Organizer and Chair: Malinky Ghosh

Panelists: (flyer)

Albert Z. H. Wang	University of California Riverside & ASA
Valinda Kennedy	University Relations International Business Machines Corp.
Eric Hunt-Schroeder	Marvell & University of Vermont Grad Student
John Oakley	Science Director, Semiconductor Research Corporation
Dr. Bahram Nassersharif	Capstone Director, University of Rhode Island

Lunch 12:10 pm - 1:10 pm

Industry Paper Session 2a

Session Chair: Session Co-chair:

1:10 pm – 1:30 pm: ***"Big chips, abutted designs, and DFT"***
Speaker: Kevin Gorman, ASIC Central Engineerin,g Marvell Technology, Inc
Paper, presentation
Biography:

1:30 pm – 1:50 pm: ***"A novel framework for checking and automating DRC Rules"***
Speaker: Jiseong Kim, Samsung
Paper, presentation
Biography:

1:50 pm – 2:10 pm: ***"Detecting Temporal Correlation on HfO2 Based RRAM on 65nm CMOS Technology"***
Speaker: Sarah Rafiq, College of Nanoscale Science and Engineering SUNY Polytechnic Institute
Paper, presentation
Biography:

2:10pm – 2:15 pm Break

Industry Paper Session 2b

Session Chair: Session Co-chair:

2:15 pm – 2:35 pm: ***"Design of a simple SARS-CoV-2 (COVID-19) detector for fast detection"***
Speaker: Mr. Supriya Karmakar, Farmingdale State College-SUNY
Paper, presentation
Biography:

2:35 pm – 2:55 pm: ***"Fault Coverage Analysis using Sneak Path based Testing in Memristor Circuits"***
Speaker: Rasika Joshi, Intel Corporation
Paper, presentation
Biography:

Thursday, May 26

Session 5

10:00 am – 10:05 am Welcome: Kelly Ockunzzi General Chair
10:05 am – 10:10 am Invited Speaker Introduction:
10:10 am – 10:55 am ***"Applications of Analog Fault Simulation to Digital, Memory, ADC and Package Level Tests"*** Speakers: Lakshmanan Balasubramanian, Supraja R, Rubin Parekhji flyer, presentation Abstract: Biography:
10:55 am – 11:00 am Break
Industry Paper Session 3a
Session Chair: Session Co-chair:
11:00 pm – 11:20 pm: ***"Detection and Classification of PCB Defects using Deep Learning Methods"*** Speaker: Andria Legon, Department of Computational Modeling and Simulation Engineering Old Dominion University Paper, presentation Biography:
11:20 pm – 11:40 pm: ***"Fast Turn Around Time Development Flow for high Quality LVS rule files"*** Speaker: Ahmed Saleh, Siemens EDA Paper, presentation Biography:
11:40 pm – Noon: ***"In 12nm FinFET Technology, performance analysis of low power 6T SRAM layout designs with two different topologies"*** Speaker: Sajib Barua, Circuit and System Design Department, Ulkasemi Private Limited Paper, presentation Biography:
Noon – 1:00 pm Lunch
Industry Paper Session 3b
Session Chair: Session Co-chair:
1:00 pm – 1:20 pm: ***"Multi-Heuristic Machine Intelligence Guidance in Automatic Test Pattern Generation"*** Speaker: Soham Roy, Intel Corporation Paper, presentation Biography:
1:20 pm – 1:40 pm: ***"Design of Ballistic MOSFET for Operation at Terahertz Frequencies"*** Speaker: Samson Mil'shtein, Umass Lowell Paper, presentation Abstract: Biography:
1:40 pm – 2:00 pm: ***"Fast and Accurate post-layout simulation methodology using 4nm LVS rule deck"*** Speaker: Woonggyu Lee, Samsung Paper, presentation Biography:
2:00 pm – 2:10 pm Closing remarks: Best Student Paper Vice General Chair: Andy Laidler