

WARREN B. NELMS ANNUAL

IoT

CONFERENCE 2024

CONFERENCE PROGRAM

“Secure and Intelligent Internet of Things for Solving Global Problems”

December 5-6, 2024
Gainesville, Florida

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On behalf of the Warren B. Nelms Institute for the Connected World, it is our distinct honor to welcome you to the second Warren B. Nelms Annual IoT Conference at the University of Florida.

The Warren B. Nelms Institute for the Connected World is a leader in advancing research, education, and outreach in all core aspects of the Internet of Things (IoT) and its convergence with Artificial Intelligence (AI). Our mission focuses on developing groundbreaking IoT technologies and their innovative applications to address pressing global challenges.

The conference brings together our talented students and faculty, academic collaborators, industry and government sponsors, and inspiring leaders from different sectors, who are all pushing the frontiers of IoT and AI in a myriad of ways. We are particularly delighted to welcome many of our collaborators from the Southeast Region of U.S.A.

Through the collective and devoted efforts of the members of our institute, we are proud to present an exceptional technical program. We want to sincerely thank all members of the organizing committee, our sponsors (IEEE Gainesville Chapter, UF Office of Research, and UF Herbert Wertheim College of Engineering), our esteemed speakers and panelists, and our students. Your support has been essential to the success of the conference.

We hope you enjoy attending the Warren B. Nelms Annual IoT Conference, learning about broad IoT technology and applications, connecting with researchers and visionaries in this field, and creating new collaboration opportunities.

Swarup Bhunia and My T. Thai

General Chairs

It is our pleasure to welcome you to the 2nd Warren B. Nelms Annual IoT Conference in Gainesville, Florida on December 5-6, 2024. The conference is sponsored by IEEE Gainesville Section under IEEE Region 3.

The conference is a unique event involving interaction of researchers and practitioners from academia, industry, and government. The program includes five keynote talks, twelve visionary talks, a small business round table, nine faculty signature talks, two panels, and poster and demo sessions from students.

The opening remarks on December 5 are delivered by Dr. Mark Tehranipoor, Professor and Chair of the ECE Department at University of Florida and Intel Charles E. Young Preeminence Endowed Chair Professor in Cybersecurity. The opening remarks on December 6 are delivered by Dr. Forrest Masters, Interim Dean of the College of Engineering at University of Florida and Professor in the Engineering School of Sustainable Infrastructure & Environment.

The keynote and visionary talks are delivered by experts across the country and cover different aspects of Internet-of-Things and Artificial Intelligence and their role and impact in our society. The small business round table involves several businesses that provide solutions in the IoT domain and representatives from these companies discuss their success stories and challenges. The faculty signature talks are short TED-style presentations outlining emergent research ideas. The student poster and demo sessions exhibit interesting research results demonstrating unique ways of harnessing the strengths of IoT and AI technologies for addressing a variety of impactful problems as well as the limits and vulnerabilities of these technologies.

The program features two panel discussions. The first panel, titled “Security, Safety, and Resilience of IoT/CPS: New Challenges and Prospects?” examines the role of security and safety challenges in the Internet-of-Things ecosystem. The second panel, titled “Edge Intelligence: What to Hope and Fear?” looks at the emergent area of edge intelligence and its capabilities and limits.

We look forward to seeing you in Gainesville. We hope you enjoy the conference program and have an interesting and stimulating experience.

Sandip Ray and Tuba Yavuz
Program Chairs

THURSDAY, DECEMBER 5

8:00-8:45AM	REGISTRATION & CONTINENTAL BREAKFAST
<p>SESSION 1: PLENARY SESSION Session Chair: Janise McNair, <i>UF</i></p>	
8:50 – 9:15 AM	<p>Welcome & Opening Remarks Organizing Committee</p>
9:20 – 9:55 AM	<p>Keynote Talk "Mind the Gap: Vulnerabilities and Opportunities for Cyber R&D at the Edge" Speaker: Robert Denz, <i>Riverside Research</i></p>
10:00 – 10:25 AM	<p>Visionary Talk "Tactical Edge Computing: Research Challenges and Opportunities" Speaker: Jonathan Ashdown, <i>Air Force Research Laboratory</i></p>
10:25 – 10:45 AM	BREAK
<p>SESSION 2: INVITED TALKS Session Chair: Siddhartha Bhattacharyya, <i>FIT</i></p>	
10:45 – 11:05 AM	<p>Visionary Talk "Recent Progress in Supervised Learning" Speaker: Vinod K. Mishra, <i>DEVCOM Army Research Laboratory</i></p>
11:10 – 11:30 AM	<p>Visionary Talk "IoT in Aerospace and Defense Environment" Speaker: Uma Jha, <i>L3Harris</i></p>
11:30 – 1:00 PM	<p>Student Demo Session <i>Located in MALA 1030 and MALA 7200</i></p>
12:00 – 1:00 PM	LUNCH BREAK
1:05 – 1:25 PM	Group Photo Session
<p>SESSION 3: INVITED TALKS Session Chairs: Jie Fu, <i>UF</i> and Hadi Amini, <i>FIU</i></p>	
1:30 – 2:05 PM	<p>Keynote Talk "The NIST AI Risk Management Framework and Ongoing NIST Work on AI" Speaker: Jesse Dunietz, <i>NIST</i></p>

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2:10 – 2:30 PM	Visionary Talk “Building Smarter: Integrating IoT into Construction for Enhanced Productivity and Safety” Speaker: Matthew Vanture, <i>The Whiting-Turner Contracting Co.</i>
2:35 – 3:15 PM	Faculty Signature Research Talks Speakers: Mohsen Rakhshan, <i>University of Central Florida</i> Prabuddha Chakraborty, <i>University of Maine</i> Ruimin Sun, <i>Florida International University</i> Tong Wu, <i>University of Central Florida</i> Sai Manoj Pudukotai Dinakarrao, <i>George Mason University</i>
3:15 – 3:35 PM	BREAK & REFRESHMENTS
SESSION 4: INVITED TALKS Session Chair: Ivan Ruchkin, <i>UF</i>	
3:40 – 4:15 PM	Keynote Talk "Harnessing Unsupervised Learning to Mitigate LLM Challenges in Scientific Discovery" Speaker: Manish Bhattarai, <i>Los Alamos National Laboratory</i>
4:20 – 4:40 PM	Visionary Talk “Changing the World with Technology” Speaker: Steve Trimberger, <i>The Trimberger Family Foundation</i>
SESSION 5: PANEL Panel Moderator: Sara Rampazzi, <i>UF</i>	
4:45 – 6:00 PM	PANEL: Security, Safety, and Resilience of IoT/CPS: New Challenges and Prospects? Panelists: Massi Corba, <i>Draper Laboratory</i> Nij Dorairaj, <i>Intel</i> John Hallman, <i>Siemens</i> Jon Mellott, <i>Mercury Systems</i>

FRIDAY, DECEMBER 6

8:00 – 8:45 AM	REGISTRATION & CONTINENTAL BREAKFAST
<p>SESSION 6: PLENARY SESSION</p> <p>Session Chair: Rickard Ewetz, <i>UF</i></p>	
8:50 – 9:00 AM	<p>Opening Remarks</p> <p>Speaker: Forrest Masters, <i>Dean, Herbert Wertheim College of Engineering, University of Florida</i></p>
9:05 – 9:40 AM	<p>Keynote Talk</p> <p>“Emerging Computing Technologies for Advance Scientific Computing Research”</p> <p>Speaker: Robinson Pino, <i>U.S. Department of Energy</i></p>
9:45 – 10:05 AM	<p>Visionary Talk</p> <p>“Synergy at Scale: Transforming AIoT with Approximate Systems”</p> <p>Speaker: Arnab Raha, <i>Intel</i></p>
10:10 – 10:30 AM	<p>Visionary Talk</p> <p>“Scaling personalized orthopedic implants using automation, AI, and 3D printing”</p> <p>Speaker: Ken Gall, <i>restor3d</i></p>
10:30 – 10:50 AM	BREAK
<p>SESSION 7: INVITED TALKS</p> <p>Session Chair: Mingyue Ji, <i>UF</i></p>	
10:50 – 11:30AM	<p>Faculty Signature Research Talks</p> <p>Speakers:</p> <p>Bianca Burini, <i>University of Florida</i></p> <p>Robert Karam, <i>University of South Florida</i></p> <p>Fnu Suya, <i>University of Tennessee</i></p> <p>Sazadur Rahman, <i>University of Central Florida</i></p>
11:30 – 1:00 PM	<p>Student Poster Session</p> <p><i>Located in MALA 1030 and MALA 7200</i></p>
12:00 – 1:00PM	LUNCH BREAK
<p>SESSION 8: INVITED TALKS</p> <p>Session Chair: Jie Xu, <i>UF</i></p>	

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1:05 – 1:40 PM	Keynote Talk “Internet of Things in the Battlefield” Speaker: Maggie Wigness, <i>DEVCOM Army Research Laboratory</i>
1:45 – 2:05PM	Visionary Talk “Revolutionizing Semiconductor Manufacturing with Digital Twins and IoT” Speaker: Eric Breckenfeld, <i>NVIDIA</i>
2:10 – 2:30PM	Visionary Talk “Energy Efficient, Secure Internet of Body (IoB) Using Electro Quasistatic Human Body Communication (EQS-HBC)” Speaker: Shovan Maity, <i>Ixana</i>
SESSION 9: LOCAL INDUSTRY ROUND TABLE Session Chair: Kemal Akkaya, <i>FIU</i>	
2:30 – 3:00PM	Local Industry Round Table A discussion by local small business on their IoT needs and IoT solutions.
3:00 – 3:15PM	BREAK & REFRESHMENTS
3:15 – 3:35PM	Student Demo & Poster Awards Ceremony Host: Andrea Ramírez-Salgado
SESSION 10: INVITED TALKS Session Chair: Mohammad Ashiqur Rahman, <i>FIU</i>	
3:35 – 3:55PM	Visionary Talk “IoT Security for Energy Systems” Speaker: Lynn Ren, <i>RTX Technology Research Center</i>
4:00 – 4:20PM	Visionary Talk "Integrated Edge-to-Exascale Workflow for Real-Time Steering in Neutron Scattering Experiments" Speaker: Viktor Reshniak, <i>Oak Ridge National Laboratory</i>
4:25 – 4:45PM	Visionary Talk “Air Force Research Laboratory Munitions Directorate (RW) Overview” Speaker: Darnell Diggs, <i>Air Force Research Laboratory</i>
SESSION 11: PANEL Panel Moderator: Baibhab Chatterjee, <i>UF</i>	

AGENDA

4:50 – 5:45PM

PANEL: Edge Intelligence: What to Hope and Fear?

Panelists:

Eric Dean, *Rohde & Schwarz*

Shovan Maity, *Ixana*

Naren V. Masna, *Cadence Design Systems*

Arnab Raha, *Intel*

Doug Recker, *Duos Edge AI*

5:50 – 6:00PM

Concluding Remarks

KEYNOTE SPEAKERS



Manish Bhattarai,
*Los Alamos National
Laboratory*



Robert Denz,
Riverside Research



Jesse Dunietz,
NIST



Robinson Pino,
*U.S. Department of
Energy*



Maggie Wigness,
*DEVCOM Army
Research Laboratory*

VISIONARY SPEAKERS



Jonathan Ashdown,
*Air Force Research
Laboratory*



Eric Breckenfeld,
NVIDIA



Darnell Diggs,
*Air Force Research
Laboratory*

SPEAKERS



Ken Gall,
restore3d



Uma Jha,
L3Harris



Shovan Maity,
Ixana



Vinod K. Mishra,
*DEVCOM Army
Research Laboratory*



Arnab Raha,
Intel



Lynn Ren,
*RTX Technology
Research Center*



Viktor Reshniak,
*Oak Ridge National
Laboratory*



Steve Trimberger,
*The Trimberger Family
Foundation*



Matthew Vanture,
*The Whiting-Turner
Contracting Co.*

PANELISTS



Massi Corba,
Draper Laboratory



Eric Dean,
Rohde & Schwarz



Nij Dorairaj,
Intel



John Hallman,
Siemens



Naren V. Masna,
*Cadence Design
Systems*



Jon Mellott,
Mercury Systems



Doug Recker,
Duos Edge AI

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