CYBER-PHYSICAL SYSTEMS AND INTERNET-OF-THINGS WEEK

MAY 13-16,2024

Hong Kong,China

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Welcome to CPS-IoT WEEK 2024!

WiFi Account

Enjoy our free Wi-Fi

for more information!

WiFi Account:
CPS-IoT WEEK 2024
Passcode:
cpsiot2024may

Scan the QR Code to Conference Proceedings

Username: cpsiotpub24
Password: conf24//

Hong Kong Science Park Map

Building 10W Venues:

- Conference Hall 04, 05, 06, and 07, 2/F, Building 10W
- Pre-function Hall, 1/F, Building 10W

Building 12W Venues:

- Grand Hall A + B, 1/F, Building 12W
- Function Hall, 1/F, Building 12W

Building 17W Venues:

- Multi-Function Room 1,2,and 3, 2/F, INNO2,Building 17W
- Studio, 2/F, INNO2, Building 17W

Building 1W:

- Happiness Cuisine (Lunch on May 14th and 15th)

Building 12E:

- Harbourview Grill (Lunch on May 16th)

- **Shuttle Bus Parking Spots**

Hyatt Regency Hong Kong, Sha Tin Lobby Pick-up/Drop-off spot:

Lobby Level, 18 Chak Cheung Street, New Territories, Sha Tin

(Scan the QR Code to Google Map.)

Hong Kong Science Park Pick-up/Drop-off spot:

Science Park Phase 3 Car Park, 12 Science Park W Ave, Science Park

(Scan the QR Code to Google Map.)

Shuttle Bus Pick-up/Drop-off Spot

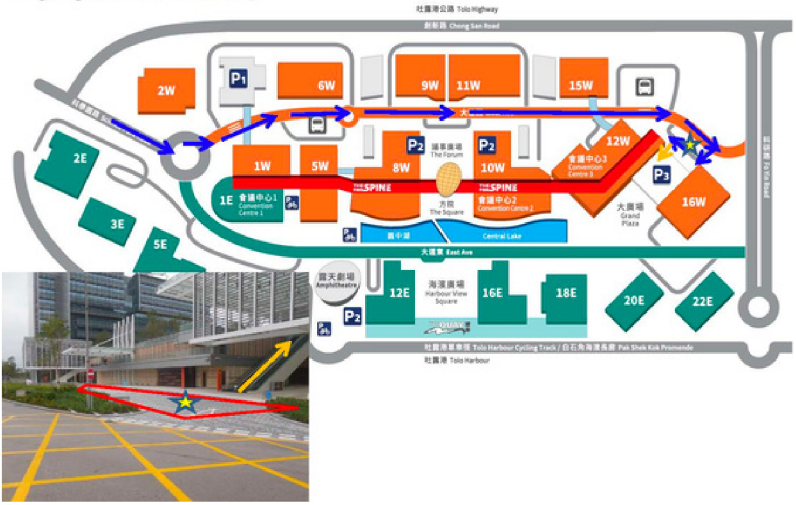
Shuttle Bus Route

Route to Grand Hall, 1/F, Building 12W.

Shuttle Bus HKSTP Pick-up/Drop-off Spot

香港科學園俯瞰圖

Hong Kong Science Park Location Map



- **Shuttle Bus Parking Spots**

To reach Grand Hall, 1/F, Building 12W:

From Parking Spot to Grand Hall

1. Use Elevator.

2. Go inside the lobby of Building 12W.

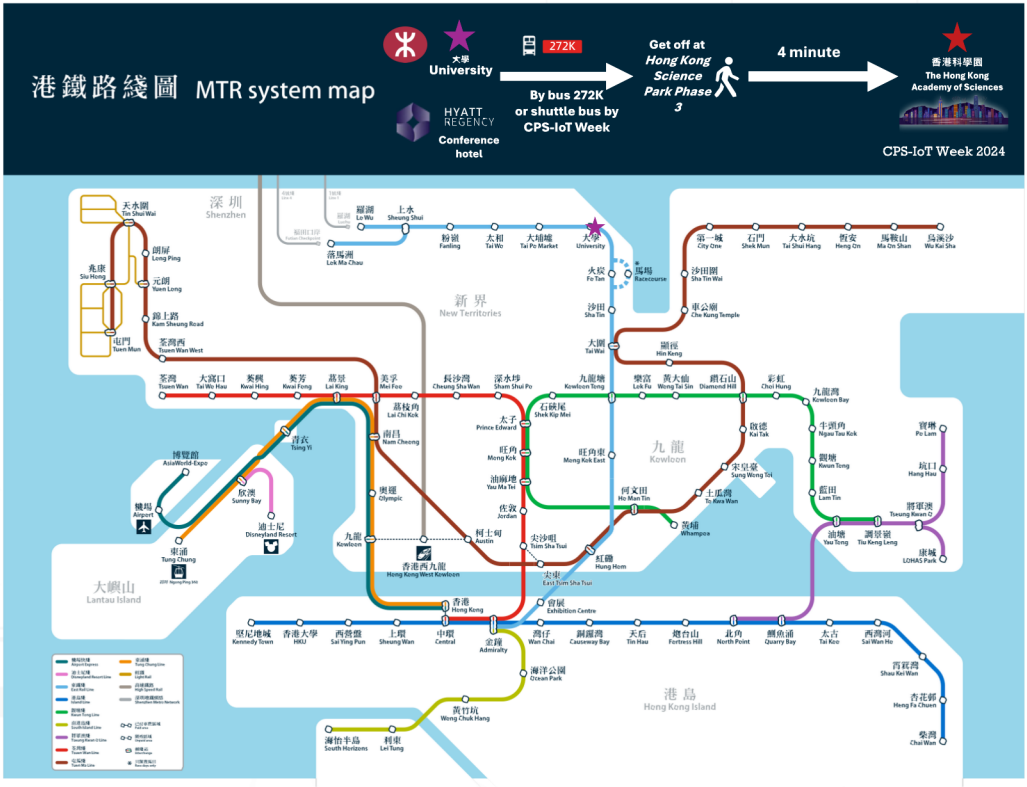
3. Go straight on after you enter in the lobby.

4. Go straight on and turn right, here you get Grand Hall!

- **Shuttle Bus Timetable**

Scan the QR Code to timetable.

- **Hong Kong MTR Direction Map**



Kind reminder: CPS-IoT Week will arrange shuttle buses between University MTR Station/Conference Hotel <---> Conference Venue. The timetable can be found on the provided brochure. A local tour guide is also provided in the brochure.

• Coffee Break Venues:

The morning session and poster demo session coffee break of main conference days is outside the Grand Hall (The keynote room, 1/F, Building 12W).
Other coffee breaks are outside each conference room.

• Breakfast during the Whole Event:

Grand Hall, 1/F, Building 12W
(Time: 8:00pm~8:30pm)

• Lunch on May 13th:

Outside each conference room. (Time: 11:45pm~1:30pm)

• Reception on May 13th:

Grand Hall A, 1/F, Building 12W (Time: 6:00pm~8:00pm)

• Lunch on May 14th and 15th:

Happiness Cuisine

S102-103, S105-106, 1/F, Building 1W,
1 Science Park West Avenue
(Time: 11:45pm~1:30pm)

Joint SenSys/IPSN/IoTDI Business Meeting

May 14th, 1:00 pm, Grand Hall, 12W

(Scan the QR Code to Google Map.)

• Lunch on May 16th:

Harbourview Grill

S081, G/F, Building 12E, 12 Science Park East Avenue
(Time: 11:45pm~1:30pm)

(Scan the QR Code to Google Map.)

• Banquet on May 15th

Program of Banquet at Lake House

6:00 pm – 10:00 pm

- **5:45 pm – 6:00 pm**

  Buses begin loading at HKSTP 12W

  (The same location as the drop-off point of the daily shuttle bus)

- **6:15 pm - 7:00 pm**

  Terrace Pre-Drink Party

- **7:30 pm – 9:30 pm**

  Banquet

  (Award Speech by Prof. Insup Lee of the University of Pennsylvania, Award Ceremony)

- **9:15 pm, 9:30 pm**

  Shuttle bus to Hyatt Shatin Hotel

• About Lake House

The Lake house is a cultural heritage located at the edge of Tai Po Kau, right next to Lake Egret. Hidden from plain sight by lush greenery.

The vast surrounding of the natural landscapes brings out the beauty within contrast between nature and human ingenuity which enhances the experience of this place as both natural and recreational elements change together in harmony with the seasons.

	Workshop Day	Main Conference		
Date/Time	Monday May 13, 2024	Tuesday May 14, 2024	Wednsday May 15, 2024	Thursday May 16, 2024
8:00am- 8:30am	Breakfast & Registration (Grand Hall, 1/F, 12W)			
8:30am– 8:45am		*Opening Remarks*	*Announcements*	*Announcements*
8:45am– 9:45am	Workshops/Tutorial/ Competitions/PhD Forum	**Keynote 1** Prof. Kang Shin The University of Michigan, USA (Grand Hall, 1/F, 12W)	**Keynote 2** Prof. Prabal Dutta University of California, Berkeley, USA (Grand Hall, 1/F, 12W)	**Keynote 3** Prof. Chenyang Lu Washington University in St. Louis, USA (Grand Hall, 1/F, 12W)
9:45am– 10:15am	Coffee Break (Outside each conference room)	Coffee Break (Grand Hall, 1/F, 12W)	Coffee Break (Grand Hall, 1/F, 12W)	Coffee Break (Grand Hall, 1/F, 12W)
10:15am– 11:45pm	Workshops/Tutorial/ Competitions/PhD Forum	**Session 1** HSCC/ICCPS/ IoTDI/IPSN/RTAS	**Session 3** HSCC/ICCPS/ IoTDI/IPSN/RTAS	**Session 6** HSCC/ICCPS/ IoTDI/IPSN/RTAS
11:45pm– 1:30pm	Lunch (Outside each conference room)	Lunch (Happiness Cuisine, 1/F, 1W) Joint SenSys/IPSN/IoTDI Business Meeting 1:00 pm, Grand Hall, 12W	Lunch (Happiness Cuisine, 1/F, 1W) CPS-IoT Career Forum 12:15pm-1:15pm (Grand Hall, 1/F, 12W, catering provided at the venue)	Lunch (Harbourview Grill, G/F, 12E)
1:30pm– 3:00pm	Workshops/Tutorial/ Competitions/PhD Forum	**Session 2** HSCC/ICCPS/ IoTDI/IPSN/RTAS	**Session 4** HSCC/ICCPS/ IoTDI/IPSN/RTAS	**Session 7** HSCC/ICCPS/ IoTDI/IPSN/RTAS
3:00pm– 3:30pm	Coffee Break (Outside each conference room)	Coffee Break (Gran Hall, 1/F, 12W)	Coffee Break (Outside each conference room)	Coffee Break (Outside each conference room)
3:30pm– 5:30pm	Workshops/Tutorial/ Competitions/PhD Forum	**Shared location:** **Poster session/Demo** HSCC/ICCPS/IoTDI/IPSN/RTAS (Grand Hall, 1/F, 12W)	**Session 5** HSCC/ICCPS/ IoTDI/IPSN/RTAS	**Session 8** HSCC/ICCPS/ IoTDI/IPSN/RTAS
5:00pm– 5:15pm				HSCC Coffee Break (Outside the HSCC conference room)
6:00pm– 8:00pm	Reception (Grand Hall, 1/F, 12W)	SIGBED Business Meeting (5:30pm–6:30pm) (Function Hall, 1/F, 12W)	Banquet Lake House (Awards, Insup Lee@Penn speech)	

Tuesday | May 14, 2024

Time/ Conferfence	HSCC	ICCPS	IoTDI	IPSN	RTAS
8am-8:30am	Breakfast & Registration (Grand Hall, 1/F, 12W)				
8:30am–8:45am	Opening Remarks (Grand Hall, 1/F, 12W)				
8:45am-9:45am	Keynote Talk 1 "Resilience of Cyber-Physical Systems: Definition, Issues, Approaches, and Examples" Kang G. Shin, The University of Michigan, USA Chair: Chenyang Lu, Washington University in St. Louis, USA (Grand Hall, 1/F, 12W)				
9:45am–10:15am	Coffee Break (Grand Hall, 1/F, 12W)				
10:15am-11:45pm	Session 1 (Multi-Function Room 2+3, 2/F INNO, 17W)	Session1 (Conference Hall 04+05, 2/F, 10W)	Session 1 (Function Hall, 1/F, 12W)	Session 1 (Grand Hall A + B, 1/F, 12W)	Session 1 (Conference Hall 06+07, 2/F, 10W)
11:45pm–1:30pm	Lunch (Happiness Cuisine, 1/F, 1W)		Joint SenSys/IPSN/IoTDI Business Meeting 1:00 pm, Grand Hall, 12W		
1:30pm-3pm	Session 2 (Multi-Function Room 2+3, 2/F INNO, 17W)	Session2 (Conference Hall 04+05, 2/F, 10W)	Session 2 (Function Hall, 1/F, 12W)	Session 2 (Grand Hall A + B, 1/F, 12W)	Session 2 (Conference Hall 06+07, 2/F, 10W)
3pm-3:30pm	Coffee Break (Grand Hall, 1/F, 12W)	Coffee Break (Grand Hall, 1/F, 12W)	Coffee Break (Grand Hall, 1/F, 12W)	Coffee Break (Grand Hall, 1/F, 12W)	Coffee Break (Grand Hall, 1/F, 12W)
3:30pm-5:30pm (2 hours)	Poster/Demo Session (Grand Hall, 1/F, 12W)				
5:30pm-6:30pm	SIGBED Business Meeting (Function Hall, 1/F, 12W)				

Wednesday | May 15, 2024

Time/ ConferfenceHSCC	ICCPS	IoTDI	IPSN	RTAS
8am-8:30am	Breakfast & Registration (Grand Hall, 1/F, 12W)			
8:30am–8:45am	Announcements (Grand Hall, 1/F, 12W)			
8:45am-9:45am	Keynote Talk 2 "From Wireless Sensors to Perceptual Networks" Prabal Dutta, University of California, Berkeley, USA Chair: Xiaofan (Fred) Jiang, Columbia University, USA (Grand Hall, 1/F, 12W)			
9:45am–10:15am	Coffee Break (Grand Hall, 1/F, 12W)			
10:15am-11:45pm	Session 3 (Multi-Function Room 2+3, 2/F INNO, 17W)	Session 3 (Conference Hall 04+05, 2/F, 10W)	Session 3 (Function Hall, 1/F, 12W)	Session 3 (Grand Hall A + B, 1/F, 12W)	Session 3 (Conference Hall 06+07, 2/F, 10W)
11:45pm–1:30pm	Lunch (Happiness Cuisine, 1/F, 1W) 12:15pm-1:15pm CPS-IoT Career Forum (Grand Hall, 1/F, 12W). Food is provided at the venue)				
1:30pm-3pm	Session 4 (Multi-Function Room 2+3, 2/F INNO, 17W)	Session 4 (Conference Hall 04+05, 2/F, 10W)	Session 4 (Function Hall, 1/F, 12W)	Session 4 (Grand Hall A + B, 1/F, 12W)	Session 4 (Conference Hall 06+07, 2/F, 10W)
3pm-3:30pm	Coffee Break (Outside the conference room.)	Coffee Break (Outside the conference room.)	Coffee Break (Grand Hall Entrance, 1/F, 12W)	Coffee Break (Grand Hall Entrance, 1/F, 12W)	Coffee Break (Outside the conference room.)
3:30pm-5:30pm (2 hours)	Session 5 (Multi-Function Room 2+3, 2/F INNO, 17W)	Session 5 (Conference Hall 04+05, 2/F, 10W)	Session 5 (Function Hall, 1/F, 12W)	Session 5 (Grand Hall A + B, 1/F, 12W)	Session 5 (Conference Hall 06+07, 2/F, 10W)
6pm-8pm	Banquet @ Lake House (Group transportation with charter buses; loading starts @5:45pm)				

Thursday | May 16, 2024

Time/ Conferfence	HSCC	ICCPS	IoTDI	IPSN	RTAS
8am-8:30am	Breakfast & Registration (Grand Hall, 1/F, 12W)				
8:30am–8:45am	Announcements (Grand Hall, 1/F, 12W)				
8:45am-9:45am	Keynote Talk 3 "AI for Health with Wearables" Chenyang Lu, Washington University in St. Louis, USA Chair: Tarek Abdelzaher, University of Illinois, USA (Grand Hall, 1/F, 12W)				
9:45am–10:15am	Coffee Break (Grand Hall, 1/F, 12W)				
10:15am-11:45pm	Session 6 (Multi-Function Room 2+3, 2/F INNO, 17W)	Session 6 (Conference Hall 04+05, 2/F, 10W)	Session 6 (Function Hall, 1/F, 12W)	Session 6 (Grand Hall A + B, 1/F, 12W)	Session 6 (Conference Hall 06+07, 2/F, 10W)
11:45pm–1:30pm	Lunch (Harbourview Grill, G/F, 12E)				
1:30pm-3pm	Session 7 (Multi-Function Room 2+3, 2/F INNO, 17W)	Session 7 (Conference Hall 04+05, 2/F, 10W)	Session 7 (Function Hall, 1/F, 12W)	Session 7 (Grand Hall A + B, 1/F, 12W)	Session 7 (Conference Hall 06+07, 2/F, 10W)
3pm-3:30pm	Coffee Break (Outside the conference room.)	Coffee Break (Outside the conference room.)	Coffee Break (Grand Hall Entrance, 1/F, 12W)	Coffee Break (Grand Hall Entrance, 1/F, 12W)	Coffee Break (Outside the conference room.)
3:30pm-5:30pm (2 hours)	Session 8 (Multi-Function Room 2+3, 2/F INNO, 17W)	Session 8 (Conference Hall 04+05, 2/F, 10W)	Session 8 (Function Hall, 1/F, 12W)	Grand Hall A + B, 1/F, 12W)	Session 8 (Conference Hall 06+07, 2/F, 10W)
6pm-8pm					

KEYNOTES

Kang G. Shin

The University of Michigan, USA

"Resilience of Cyber-Physical Systems: Definition, Issues, Approaches, and Examples"

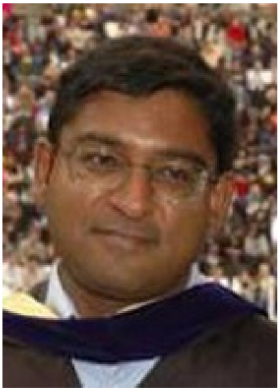
8:45 am-9:45 am, May 14th, 2024

Chair: **Chenyang Lu**, Washington University in St. Louis, USA

Abstract: I will first re-introduce the original concept of cyber-physical systems (CPSes), especially differentiating CPSes from other well-known systems such as embedded (real-time) systems, sensor networks, etc. I will then discuss how to characterize the resilience of CPSes, and present research challenges and possible approaches. Lastly, I will discuss several examples of resilient CPSes, including real-time control systems, battery management for transportation platforms, and secure in-vehicle communications, to illustrate how to deal with issues of CPS resilience.

Bio: KANG G. SHIN is the Kevin & Nancy O'Connor Professor of Computer Science in the Department of Electrical Engineering and Computer Science, The University of Michigan, Ann Arbor. His current research focuses on safe and secure embedded real-time and cyber-physical systems as well as QoS-sensitive computing and networking. He has supervised the completion of 91 PhDs, and authored/coauthored about 1,000 technical articles, a textbook and about 60 patents or invention disclosures, and received numerous awards, including 2023 IEEE TCCPS Technical Achievement Award, 2023 SIGMOBILE Test-of-Time Award, 2019 Caspar Bowden Award for Outstanding Research in Privacy Enhancing Technologies, and the Best Paper Awards from 2023 VehicleSec, 2011 ACM International Conference on Mobile Computing and Networking (MobiCom'11), the 2011 IEEE International Conference on Autonomic Computing, 2010 and 2000 USENIX Annual Technical Conferences, as well as the 2003 IEEE Communications Society William R. Bennett Prize Paper Award and the 1987 Outstanding IEEE Transactions of Automatic Control Paper Award. He has also received several institutional awards, including the Research Excellence Award in 1989, Outstanding Achievement Award in 1999, Distinguished Faculty Achievement Award in 2001, and Stephen Attwood Award in 2004 from The University of Michigan (the highest honor bestowed to Michigan Engineering faculty); a Distinguished Alumni Award of the College of Engineering, Seoul National University in 2002; 2003 IEEE RTC Technical Achievement Award; and 2006 Ho-Am Prize in Engineering (the highest honor bestowed to Korean-origin engineers). He has chaired Michigan Computer Science and Engineering Division for 4 years starting 1991, and also several major conferences, including 2009 ACM MobiCom, and 2005 ACM/USENIX MobiSys. He was a co-founder of a couple of startups, licensed some of his technologies to industry, and served as an Executive Advisor for Samsung Research.

KEYNOTES



Prabal Dutta
University of California, Berkeley
"From Wireless Sensors to Perceptual Networks"
8:45 am-9:45 am, May 15th, 2024

Chair: **Xiaofan (Fred) Jiang,** Columbia University, USA

Abstract:
A quarter century ago, a set of MobiCom challenge papers catalyzed a research community to pursue the vision of wirelessly networked sensors of increasingly diminishing proportions that could densely monitor the physical world. Today, much of the original vision had been realized, and a bewildering array and variety of systems have been fielded that allow us to gather and process unprecedented amounts of data about the physical world. But this progress has also exposed many new challenges and opportunities. This talk will draw on my lab's efforts in designing, deploying, and commercializing wireless sensors for a range of applications. The evolution of these efforts—from seemingly trivial connected sensors with simple cloud analytics to more complex networked sensors with sophiscated sensing and communications to sustainable perceptual networks that perform multi-spectral data fusion and inference at the edge to detect complex but sparse faults—has highlighted numerous exciting technical and methodological challenges ripe for attention from the research community.

Bio:
Prabal Dutta is a Professor of Electrical Engineering and Computer Sciences at University of California, Berkeley. His interests span circuits, systems, and software, with a focus on mobile, wireless, embedded, networked, and sensing systems that have applications in health, energy, and the environment. His work has yielded dozens of hardware and software systems, has won a Test-of-Time Award (SenSys'22), five Top Pick/Best Paper Awards (MICRO'16, SenSys'10, IPSN'10, HotEmNets'10, and IPSN'08), two Best Paper Nominees, numerous demo, design, poster, and industry contests, has been directly commercialized by a dozen companies and indirectly by many dozens more, and is on display at Silicon Valley's Computer History Museum. His work has been recognized with an Okawa Foundation Grant, a Sloan Fellowship, an NSF CAREER Award, a Popular Science Brilliant Ten Award, and an Intel Early Career Award. He has served as a program chair for MobiSys, BuildSys, SenSys, IPSN, HotMobile, ESWEEK IoT Day, HotMobile, and HotPower, as general chair for EWSN, and as a member of the DARPA ISAT Study Group. He holds a Ph.D. in Computer Science from UC Berkeley and an MS in Electrical Engineering and a BS in Electrical & Computer Engineering from The Ohio State University. He has co-founded several companies based on his research including Cubeworks, Gridware, nLine, and Vizi.

KEYNOTES

Chenyang Lu
Washington University in St. Louis, USA
"AI for Health with Wearables"
8:45am-9:45am, May 16, 2024

Chair: **Tarek Abdelzaher**, University of Illinois, USA

Abstract: Artificial intelligence (AI) has emerged as a powerful tool for solving complex health problems using data-driven approaches. AI for health is fueled by both the advancement in AI methods and the availability of data provided by electronic health records (EHR) and wearables. This talk will explore the potential to support precision medicine using wearables that enable unobtrusive monitoring of patients in their daily lives. To harness the full potential of wearables, it is crucial to develop machine learning (ML) models to extract reliable clinical information from noisy and incomplete sensor data. Moreover, these ML approaches need to scale effectively across a wide range of sample sizes, providing robust predictions even with limited data, while enhancing predictive power with large datasets. We will highlight three clinical studies that use Fitbit wristbands as wearable instruments. First, we have established a robust feature engineering and ML pipeline specifically tailored for wearable studies with limited sample sizes. This pipeline demonstrated its effectiveness in predicting post-operative complications in a prospective clinical trial of patients undergoing pancreatic surgery. Second, we have developed WearNet, an end-to- end deep learning model designed to detect mental health disorders using wearable data. WearNet has been trained and validated on a large public dataset comprising 8,996 participants, including 1,247 diagnosed with mental disorders. Finally, we have explored multi-task ML approaches to predict individualized responses to depression therapy based on wearable data collected in a randomized controlled trial (RCT). By the end of the talk, we will discuss the opportunities and directions in the interdisciplinary field of AI and wearables for health, showcasing the transformative impact they can have on healthcare outcomes.

Bio: Chenyang Lu is the Fullgraf Professor of Computer Science & Engineering and holds joint appointments as Professor of Anesthesiology and in Medicine at Washington University in St. Louis. He is the founding director of the AI for Health Institute (AIHealth), a multidisciplinary institute dedicated to driving AI innovation in health research. His research interests include AI for health, Internet of Things, real-time systems, and cyber-physical systems. In 2022, he was honored with the Outstanding Technical Achievement Award and Leadership Award from the IEEE Technical Community on Real-Time Systems (TCRTS). He has also been recognized by a Test of Time Award from ACM Conference on Embedded Networked Sensor Systems (SenSys), an Influential Paper Award from IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), and nine Best or Outstanding Paper Awards. He is Editor-in-Chief of ACM Transactions on Cyber-Physical Systems. He also served as Editor-in-Chief of ACM Transactions on Sensor Networks, Chair of TCRTS and chaired leading conferences on IoT, real-time systems, and cyber-physical systems. He is a Fellow of ACM and IEEE.

The printed version is provided for your reference only. To access the most up-to-date program, please scan the QR code or visit the official website.

IPSN's conference venue or coffee break venue is Grand Hall, 1/F Building 12W if not indicated specifically.

IPSN Day 1: Tuesday, May 14, 2024

8:00 AM: BREAKFAST (Grand Hall, 1/F, Building 12W)
8:45 AM: CPS-IOT WEEK OPENING & KEYNOTE (Grand Hall, 1/F, Building 12W)
9:45 AM: COFFEE BREAK (Grand Hall, 1/F, Building 12W)
10:15 AM: SESSION 1: MACHINE LEARNING

Lifelong Intelligence beyond the Edge using Hyperdimensional Computing
X. Yu, A. Thomas, I. Moreno, L. Gutierrez, T. Rosing (UC San Diego, CETYS University)

FedCFC: On-Device Personalized Federated Learning with Closed-Form Continuous-Time Neural Networks
Y. Dai, R. Tan (Nanyang Technological University)

ArtFL: Exploiting Data Resolution in Federated Learning for Dynamic Runtime Inference via Multi-Scale Training
S. Jiang, X. Shuai, G. Xing (The Chinese University of Hong Kong)

11:45 PM - 1:30 PM: LUNCH BREAK
(Happiness Cuisine, 1/F, 1W)
1:30 PM: SESSION 2: WIRELESS COMMUNICATIONS

Enabling Acoustic IoT through Composable Distributed Beamforming Tags
M. Rostami, A. Liu, K. Sundaresan (Georgia Institute of Technology)

NNCTC: Physical Layer Cross-Technology Communication via Neural Networks
H. Wang, J. Wang, W. Jiang, D. Gao
(Nanjing Forestry University, Singapore University of Technology and Design)

Sol-Fi: Enabling Joint Illumination and Communication in Enclosed Areas with Sunlight
M. Tapia, T. Xu, M. Zuniga (Delft University of Technology)

3:00 PM: COFFEE BREAK (Grand Hall, 1/F, 12W)
3:30 PM: POSTER/DEMO SESSIONS (Grand Hall, 1/F, 12W)
5:30 PM: SIGBED BUSINESS MEETING
(Function Hall, 1/F, 12W)

IPSN Day 2: Wednesday, May 15, 2024

8:00 AM: BREAKFAST (Grand Hall, 1/F, 12W)
8:30 AM: CPS-IOT WEEK OPENING
8:45 AM: KEYNOTE 2 (Grand Hall, 1/F, Building 12W)
9:45 AM: COFFEE BREAK (Grand Hall, 1/F, 12W)
10:15 AM: SESSION 3: LOCALIZATION AND OBJECT DETECTION
LiDARSpectra: Indoor Spectral Mapping with Low-cost LiDARs
J. Hu, Y. Wang, H. Jia, Ch. Jiang, M. Hassan, B. Kusy, W. Hu (University of New South Wales, CSIRO)
BiGuide: A Bi-level Data Acquisition Guidance for Object Detection on Mobile Devices
L. Duan, Y. Chen, Z. Qu, M. Gorlatova (Duke University)
WiCloak: Protect Location Privacy of WiFi Devices
J. Jiang, J. Wang, Y. Liu, Y. Chen, Y. Liu (Tsinghua University)
11:45 PM - 1:30 PM: LUNCH BREAK (Happiness Cuisine, 1/F, 1W)
1:30 PM: SESSION 4: SYSTEMS
Time-Specific Integrity Service in MQTT protocol
H. Yan, H. Hu, Q. Ye (The Hong Kong Polytechnic University)
Retcon: Live Updates for Embedded Event-Driven Applications
J-L. Watson, S. Agrawal, R. Tsang, S. Luo, R. Popa, P. Dutta (UC Berkeley)
Simba: A Unified Framework to Explore and Facilitate the Design of Battery-Free Systems
H. Brunner, J. de Winkel, C. Boano, P. Pawelczak, K. Roemer (TU Graz, TU Delft)
3:00 PM: COFFEE BREAK
3:30 PM: SESSION 5: BEHAVIOR/ACTIVITY SENSING
Beyond-Voice: Towards Continuous 3D Hand Pose Tracking on Commercial Home Assistant Devices
Y. Li, R. Reddy, Ch. Zhang, R. Nandakumar (Cornell Tech)
Continuous Multi-user Activity Tracking via Room-Scale mmWave Sensing
A. Sen, A. Das, S. Pradhan, S. Chakraborty (Indian Institute of Technology, NIIT University, CISCO)
Split Learning-based Sound Event Detection in Energy-Constrained Sensor Devices
J. Ahn, D. Kim, H. Cha (Yonsei University)

6:00 PM: BANQUET (Lake House, see “Maps&Venues“)

IPSN Day 3: Wednesday, May 16, 2024

8:00 AM: BREAKFAST (Grand Hall, 1/F, 12W)

8:30 AM: ANNOUNCEMENTS

8:45 AM: CPS-IOT WEEK KEYNOTE (Grand Hall, 1/F, Building 12W)

9:45 AM: COFFEE BREAK (Grand Hall, 1/F, 12W)

10:15 AM: SESSION 6: PRIVACY/SECURITY

RelayRec: Empowering Privacy-Preserving CTR Prediction via Cloud-Device Relay Learning

Y. Deng, G. Wang, S. Yue, W. Rao, Q. Zu, W. Wang, S. Chen, J. Ren, Y. Zhang (Tsinghua, Meituan)

dTEE: A Declarative Approach to Secure IoT Applications Using TrustZone

T. Sun, B. Li, Y. Teng, Y. Gao, W. Dong (Zhejiang University, Southeast University)

Twofer: Ambiguous Transmissions for Low-Latency Sensor Networks Facing Noise, Privacy and Loss

J. Oostvogels, S. Michiels, D. Hughes (KU Leuven)

11:45 PM - 1:30 PM: LUNCH BREAK (Harbourview Grill, G/F, 12E)

1:30 PM: SESSION 7: LOW POWER WIDE AREA NETWORKS

Hitting the sweet spot: an SF-any coding paradigm for empowering city-wide LoRa communications

W. Chen, J. Zhang, X. Xia, S. Wang, T. He (Shanghai University, Southeast University, The Hong Kong Polytechnic University)

BIC-LoRa: Bits in Chirp Shapes to Boost Throughput in LoRa

G. Lee, E. Park, M. Park, J. Paek, S. Bahk (Seoul National University, Chung-Ang University)

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IoTDI's conference venue or coffee break venue is Function Hall, 1/F Building 12W if not indicated specifically.

Tuesday, May 14th

8:00 AM: BREAKFAST (Grand Hall, 1/F, 12W)

8:30 AM: CPS-IOT WEEK OPENING & KEYNOTE (Grand Hall, 1/F, Building 12W)

9:45 AM: COFFEE BREAK (Grand Hall, 1/F, Building 12W)

10:15 AM: SESSION 1: THEORY AND SYSTEMS

Beyond Thresholds: A General Approach to Sensor Selection for Practical Deep Learning-based HAR

G. Cooper, R. Marculescu

ImmunoPlane: Middleware for Providing Adaptivity to Distributed Internet-of-Things Applications

K. Jung, G. Mitra, S. Gopalakrishnan, K. Pattabiraman

Wireless Multicast Rate Control Adaptive to Application Goodput and Loss Requirements

M. Elbadry, F. Ye, P. Milder

11:45 PM - 1:30 PM: LUNCH BREAK (Happiness Cuisine, 1/F, 12W)

1:30 PM: SESSION 2: APPLICATION I

LIZARD: Pervasive Sensing for Autonomous Plastic Litter Monitoring

F. Dar, M. Olapade, A. Ottun, Z. Yin, M. Liyanage, A. Zuniga, M. Passanantti,

S. Tarkoma, P. Nurmi, H. Flores

SEAGULL: Low-Cost Pervasive Sensing for Monitoring and Analysing Underwater Plastics

H. Flores, A. Zuniga, M. Radeta, Z. Yin, M. Liyanage, N. Motlagh,N. Nguyen,

S. Tarkoma, M. Youssef, P. Nurmi

Cooperative Infrastructure Perception

F. Ahmad, C. Shin, W. Pang, B. Leong, P. Ghosh, R. Govindan

3:00 PM COFFEE BREAK (Grand Hall, 1/F, Building 12W)

3:30 PM POSTER/DEMO SESSION (Grand Hall, 1/F, Building 12W)

Wednesday, May 15th

8:00 AM: BREAKFAST (Grand Hall, 1/F, Building 12W)

8:45 AM: CPS-IOT WEEK OPENING & KEYNOTE (Grand Hall, 1/F, Building 12W)

10:00 AM: COFFEE BREAK (Grand Hall, 1/F, Building 12W)

10:15 AM: SESSION 3: APPLICATION II

A Deep-Learning Approach to Estimate People Count with mmWave Point Clouds

G. Vaidya, M. Zuniga

Real-Time Multimodal Cognitive Assistant for Emergency Medical Services

K. Weerasinghe, S. Janapati, X. Ge, S. Kim, S. Iyer, J. Stankovic, H. Alemzadeh

i-CardiAx: Wearable IoT-Driven System for Early Sepsis Detection Through Long-Term Vital Sign Monitoring

K. Dheman, M. Giordano, C. Thomas, P. Schilk, M. Magno

11:45 PM - 1:30 PM: LUNCH BREAK (Happiness Cuisine, Grand Hall, 1/F, 1W)

1:30 PM: SESSION 4: IoT AND AI/ML

NaviSlim: Adaptive Context-Aware Navigation and Sensing via Dynamic Slimmable Networks

T. Johnsen, M. Levorato

CHESSFL: Clustering Hierarchical Embeddings for Semi-Supervised Federated Learning

A. Farcas, M. Lee, A. Payani, H. Latapie, R. Kompella, R. Marculescu

Orientation Estimation Piloted by Deep Reinforcement Learning

M. Liu, S. Yang, A. Rathee, W. Du

3:30 PM: SESSION 5: SECURITY

Handling Jamming Attacks in a LoRa Network

M. Haque, A. Saifullah

Blades: A Unified Benchmark Suite for Byzantine Attacks and Defenses in Federated Learning

S. Li, E. Ngai, F. Ye, L. Ju, T. Zhang, T. Voigt

Towards Quantum Resilient IoT: A Backward-Compatible Approach to Secure BLE Key Exchange Against Quantum Threats

T. Liu, G. Ramachandran, R. Jurdak

6:00 PM BANQUET (The Lake House, see "Maps & Venues")

Thursday, May 16th

8:00 AM: BREAKFAST (Grand Hall, 1/F, 12W)

8:45 AM: CPS-IOT WEEK OPENING & KEYNOTE

(Grand Hall, 1/F, Building 12W)

9:45 AM: COFFEE BREAK (Grand Hall, 1/F, 12W)

10:15 AM: SESSION 6: POSE & GESTURE RECOGNITION

SUPER: Seated Upper Body Pose Estimation using mmWave Radars

B. Zhang, Z. Zhou, B. Jiang, R. Zheng

TinyssimoRadar: In-Ear Hand Gesture Recognition with Ultra-Low Power mmWave Radars

A. Ronco, P. Schilk, M. Magno

ASLRing: American Sign Language Recognition with Meta-Learning on Wearables

H. Zhou, T. Lu, K. DeHaan, M. Gowda

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HSCC's conference venue or coffee break venue is Multi-Function Room 2+3, 2/F INNO, Building 17W if not indicated specifically.

Tuesday, May 14th

8:00 AM: BREAKFAST & REGISTRATION (Grand Hall, 1/F, 12W)

8:30 AM: ANNOUNCEMENTS

8:45 AM: CPS-IOT K1: CPS-IOT KEYNOTE (Grand Hall, 1/F, 12W)

9:45 AM: COFFEE BREAK (Grand Hall, 1/F, 12W)

10:15 AM: SESSION 1: STABILITY

Chair: Sriram Sankaranarayanan

10:15AM: Further Results on Stability of Linear Systems with Slow and Fast Time Variation and Switching

Daniel Liberzon and Hyungbo Shim, PRESENTER: Hyungbo Shim

10:45AM: Poles-based Invariant Generation for Verifying the BIBO Stability of Digital Filters

Xiao Guo, Jianhua Zhao and Lei Bu, PRESENTER: Xiao Guo

11:15 AM:A Data-Driven Approach for Certifying Asymptotic Stability and Cost Evaluation for Hybrid Systems

Carlos Andres Montenegro Gonzalez, Santiago Jimenez Leudo and Ricardo Sanfelice, PRESENTER: Carlos Andres Montenegro Gonzalez

11:45 PM - 1:30 PM: LUNCH BREAK (Happiness Cuisine, 1/F, 1W)

1:30 PM: SESSION 2: LEARNING

Chair: Abolfazl Lavaei

1:30 PM:Incorporating Logic in Online Preference Learning for Safe Personalization of Autonomous Vehicles

Ruya Karagulle, Necmiye Ozay, Nikos Arechiga, Jonathan Decastro, and Andrew Best, PRESENTER: Ruya Karagulle

2:00 PM: Learning Deterministic Multi-Clock Timed Automata

Yu Teng, Miaomiao Zhang, and Jie An, PRESENTER: Yu Teng

2:30 PM: FaMoS- Fast Model Learning for Hybrid Cyber-Physical Systems using Decision Trees

Swantje Plambeck, Aaron Bracht, Nemanja Hranisavljevic, and Goerschwin, PRESENTER: Swantje Plambeck

3:00 PM: COFFEE BREAK (Grand Hall, 1/F, 12W)

3:30 PM: SESSION P: POSTERS AND DEMOS

Wednesday, May 15th

8:45 AM: CPS-IOT K2: CPS-IOT KEYNOTE (Grand Hall, 1/F, 12W)

9:45 AM: COFFEE BREAK (Grand Hall, 1/F, 12W)

10:15 AM: SESSION 3: HSCC KEYNOTE AND TOT AWARD

Chairs: Manuel Mazo Jr. and Erika Abraham

10:15 AM: Data-driven Verification for Safe Autonomy: Reachability, Entropy, and Perception Contracts

PRESENTER: Sayan Mitra

11:15 AM: Test-of-Time Award

PRESENTER: Sriram Sankaranarayanan

11:45 PM - 1:30 PM: LUNCH BREAK (Happiness Cuisine, 1/F, 1W)

1:30 PM: SESSION 4: ANALYSIS

1:30 PM: Inner and Outer Approximate Quantifier Elimination for General Reachability Problems

Eric Goubault and Sylvie Putot, PRESENTER: Eric Goubault

2:00 PM: Temporal Behavior Trees: Robustness and Segmentation

Sebastian Schirmer, Jasdeep Singh, Emily Jensen, Johann C. Dauer, Bernd Finkbeiner, and Sriram Sankaranarayanan,

PRESENTER: Sebastian Schirmer

2:30 PM: Closure Certificates

Vishnu Murali, Ashutosh Trivedi, and Majid Zamani, PRESENTER: Vishnu Murali

3:00 PM: COFFEE BREAK

3:30 PM: SESSION 5: SYNTHESIS

3:30 PM: Contract-Based Distributed Logical Controller Synthesis

Ashwani Anand, Satya Prakash Nayak, and Anne-Kathrin Schmuck, PRESENTER: Satya Prakash Nayak

4:00 PM: Cone-Based Abstract Interpretation for Nonlinear Positive Invariant Synthesis

Guillaume Berger, Masoumeh Ghanbarpour, and Sriram Sankaranarayanan, PRESENTER: Guillaume Berger

4:30 PM: Safe Controller Synthesis for Nonlinear Systems Using Bayesian Optimization Enhanced Reinforcement Learning

Chaomin Jin, Xiaoxuan Ma, Tianxiang Ren, Wang Lin, and Zuohua Ding, PRESENTER: Chaomin Jin

5:00 PM: Memoryless Concretization Relation

Julien Calbert, Sebastien Mattenet, Antoine Girard, and Raphael Jungers, PRESENTER: Julien Calbert

6:00 PM BANQUET (See “Maps & Venues)

Thursday, May 16th

8:45 AM: CPS-IOT K3: CPS-IoT KEYNOTE

(Grand Hall, 1/F, 12W)

9:45 AM: COFFEE BREAK

(Grand Hall, 1/F, 12W)

10:15 AM: SESSION 6: MODELING AND SPECIFICATION

Chair: Sylvie Putot

10:15 AM: Algorithms for Identifying Flagged and Guarded Linear Systems

Guillaume Berger, Monal Narasimhamurthy, and Sriram Sankaranarayanan, PRESENTER: Sriram Sankaranarayanan

10:45 AM: Approximating the Geometry of Temporal Logic Formulas

Christian Abu-Mrad and Houssam Abbas, PRESENTER: Houssam Abbas

11:15 AM: Fast and Scalable Monitoring for Value-Freeze Operator augmented Signal Temporal Logic

Bassem Ghorbel and Vinayak Prabhu, PRESENTER: Bassem Ghorbel

11:45 AM - 1:30 PM: LUNCH BREAK

(Harbourview Grill, G/F, 12E)

1:30 PM - 2:30 PM: SESSION 7A: TOOLS

Chair: Houssam Abbas

1:30 PM: MULTIGAIN 2.0: MDP Controller Synthesis for Multiple Mean-Payoff, LTL and Steady-State Constraints (Tool paper)

Severin Bals, Alexandros Evangelidis, Jan Kretinsky and Jakob Waibel

1:45 PM LyZNet: A Lightweight Python Tool for Learning and Verifying Neural Lyapunov Functions and Regions of Attraction (Tool paper)

Jun Liu, Yiming Meng, Maxwell Fitzsimmons, and Ruikun Zhou, PRESENTER: Jun Liu

2:00 PM: Fossil 2.0: Formal Certificate Synthesis for the Verification and Control of Dynamical Models (Tool paper)

Alec Edwards, Andrea Peruffo, and Alessandro Abate, PRESENTER: Alessandro Abate

2:15 PM: Falsification using Reachability of Surrogate Koopman Models (Tool paper)

Stanley Bak, Sergiy Bogomolov, Abdelrahman Hekal, Niklas Kochdumper, Ethan Lew, Andrew Mata, and Amir Rahmati, PRESENTER: Abdelrahman Hekal

2:30 PM: SESSION 7B: STOCHASTIC SYSTEMS I

2:30 PM: A Sample-Driven Solving Procedure for the Repeated Reachability of Quantum Continuous-time Markov Chains

Hui Jiang. Jianling Fu, Ming Xu, Yuxin Deng and Zhibin Li, PRESENTER: Jianling Fu

3:00 PM: COFFEE BREAK

3:30 PM: SESSION 8A: STOCHASTIC SYSTEMS II

Chair: Raphaël Jungers

3:30 PM: Abstraction-based Synthesis of Stochastic Hybrid Systems

PRESENTER: Abolfazl Lavaei

4:00 PM: CTL Model Checking of MDPs over Distribution Spaces: Algorithms and Sampling-based Computations

Yulong Gao, Karl H. Johansson, and Alessandro Abate, PRESENTER: Alessandro Abate

4:30 PM: Context-triggered Games for Reactive Synthesis over Stochastic Systems via Control Barrier Certificates

Ameneh Nejati, Satya Prakash Nayak, and Anne-Kathrin Schmuck, PRESENTER: Ameneh Nejati

5:00 PM: COFFEE BREAK

5:15 PM: SESSION 8B: ANALYSIS II

5:15 PM: Linear Dynamical Systems with Continuous Weight Functions

Rajab Aqhamov, Christel Baier, Toqhrul Karimov, Joel Ouaknine, and Jakob Piribauer, PRESENTER: Rajab Aghamov

5:45 PM: Recurrence of Nonlinear Control Systems: Entropy and Bit Rates

Hussein Sibai and Enrique Mallada, PRESENTER: Enrique Mallada

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ICCPS's conference venue or coffee break venue is Conference Hall 04+05, 2/F, Building 10W if not indicated specifically.

Tuesday, May 14th

8:00 AM: BREAKFAST (Grand Hall, 1/F, 12W)
8:30 AM: OPENING REMARKS
8:45 AM: CPS-IOT WEEK OPENING & KEYNOTE
9:45 AM: COFFEE BREAK (Grand Hall, 1/F, 12W)
10:15 AM: SESSION 1: LEARNING-ENABLED CPS
Session Chair: Indranil Saha

Repairing Learning-Enabled Controllers While Preserving What Works
Pengyuan Lu (University of Pennsylvania), Matthew Cleaveland (University of Pennsylvania), Oleg Sokolsky (University of Pennsylvania), Insup Lee (University of Pennsylvania) and Ivan Ruchkin (University of Florida)

Zero-One Attack: Degrading Closed-Loop Neural Network Control Systems using State-Time Perturbations
Stanley Bak (Stony Brook University), Sergiy Bogomolov (Newcastle University), Abdelrahman Hekal (Newcastle University), Veena Krish (Stony Brook University), Andrew Mata (Stony Brook University) and Amir Rahmati (Stony Brook University)

Attention-Based Real-Time Defenses for Physical Adversarial Attacks in Vision Applications
Giulio Rossolini (Scuola Superiore Sant'Anna), Alessandro Biondi (Scuola Superiore Sant'Anna) and Giorgio Buttazzo (Scuola Superiore Sant'Anna)

11:45 PM: LUNCH, DIVERSITY/SIGBED CN
(Happiness Cuisine, 1/F, 1W)

1:30 PM: SESSION 2: CPS Security
Session Chair: Sajal Das
Thinking beyond bus-off: Targeted Control Falsification in CAN
Ipsita Koley (IIT Kharagpur), Sunandan Adhikary (IIT Kharagpur) and Soumyajit Dey (IIT Kharagpur)
Rampo: A CEGAR-based Integration of Binary Code Analysis and System Falsification for Cyber-Kinetic Vulnerability Detection
Kohei Tsujio (University of California Irvine), Mohammad Al Faruque (University of California Irvine) and Yasser Shoukry (University of California Irvine)
Enhancing power grid resilience to cyber-physical attacks using distributed retail electricity markets
Vineet Jagadeesan Nair (Massachusetts Institute of Technology), Priyank Srivastava (IIT Delhi) and Anuradha Annaswamy (Massachusetts Institute of Technology)
3:00 PM: COFFEE BREAK (Grand Hall, 1/F, 12W)
3:30 PM: POSTER/DEMO SESSION (Grand Hall, 1/F, 12W)

5:30 PM: SIGBED Business Meeting
(Function Hall, 1/F, 12W)

Wednesday, May 15th

8:00 AM: BREAKFAST (Grand Hall, 1/F, 12W)
8:30 AM: ANNOUNCEMENTS
8:45 AM: CPS-IOT WEEK KEYNOTE
9:45 AM: COFFEE BREAK (Grand Hall, 1/F, 12W)
10:15 AM: SESSION 3: REINFORCEMENT LEARNING FOR CPS
Session Chair: Eduardo Tovar
Optimal Runtime Assurance via Reinforcement Learning
Kristina Miller (University of Illinois Urbana-Champaign), Chris Zeitler (RationalCyPhy), William Shen (University of Illinois Urbana-Champaign), Kerianne Hobbs (Air Force Research Laboratory), Sayan Mitra (University of Illinois Urbana-Champaign), John Schierman (Air Force Research Laboratory) and Mahesh Viswanathan (University of Illinois Urbana-Champaign)
Vulnerability Analysis for Safe Reinforcement Learning in Cyber-Physical Systems
Shixiong Jiang (University of Notre Dame), Mengyu Liu (University of Notre Dame) and Fanxin Kong (University of Notre Dame)
FAIRO: Fairness-aware Adaptation in Sequential-Decision Making for Human-in-the-Loop Systems
Tianyu Zhao (University of California, Irvine), Mojtaba Taherisadr (University of California, Irvine) and Salma Elmalaki (University of California, Irvine)
11:45 PM: Lunch, Diversity/SIGBED CN
(Happiness Cuisine, 1/F, 1W)

1:30 PM: SESSION 4: MIDDLEWARE & SOFTWARE FOR CPS

Session Chair: Ivan Ruchkin

Quantitative Safety-Driven Co-Synthesis of Cyber-Physical System Implementations

Clara Hobbs (University of North Carolina, Chapel Hill), Shengjie Xu (University of North Carolina, Chapel Hill), Bineet Ghosh (University of Alabama), Enrico Fraccaroli (University of North Carolina, Chapel Hill), Sridhar Duggirala (University of North Carolina, Chapel Hill) and Samarjit Chakraborty (University of North Carolina, Chapel Hill)

Playground: A Safe Building Operating System

Xiaohan Fu (University of California, San Diego), Yihao Liu (Nanyang Technological University), Jason Koh (Mapped), Dezhi Hong (Amazon), Rajesh Gupta (University of California, San Diego) and Gabe Fierro (Colorado School of Mines)

Formally Verified C Code Generation from Hybrid Communicating Sequential Processes

Shuling Wang (Chinese Academy of Sciences), Zekun Ji (Chinese Academy of Sciences), Bohua Zhan (Chinese Academy of Sciences), Xiong Xu (Chinese Academy of Sciences), Qiang Gao (Chinese Academy of Sciences) and Naijun Zhan (Chinese Academy of Sciences)

3:00 PM: COFFEE BREAK

3:30 PM: SESSION 5: AUTONOMOUS VEHICLES & TRANSPORTATION

Session Chair: Oleg Sokolsky

Sensor Data Transplantation for Redundant Hardware Switchover in Micro Autonomous Vehicles

Cailani Lemieux Mack (Vanderbilt University), Kevin Leach (Vanderbilt University) and Kevin Angstadt (St. Lawrence University)

A Middle Way to Traffic Enlightenment
Matthew Nice (Vanderbilt University), George Gunter (Vanderbilt University), Junyi Ji (Vanderbilt University), Yuhang Zhang (Vanderbilt University), Matthew Bunting (Vanderbilt University), Will Barbour (Vanderbilt University), Jonathan Sprinkle (Vanderbilt University) and Dan Work (Vanderbilt University)
An Online Approach to Solving Public Transit Stationing and Dispatch Problem
Jose Paolo Talusan (Vanderbilt University), Chaeeun Han (Pennsylvania State University), Ayan Mukhopadhyay (Vanderbilt University), Aron Laszka (Pennsylvania State University), Dan Freudberg (Nashville WeGo) and Abhishek Dubey (Vanderbilt University)
5:00 PM: ICCPS Community Meeting
6:00 PM: Banquet
(Lake House, see "Maps & Venues")

Thursday, May 16th

8:00 AM: BREAKFAST (Grand Hall, 1/F, 12W)
8:30 AM: ANNOUNCEMENTS
8:45 AM: CPS-IOT WEEK KEYNOTE
(Grand Hall, 1/F, Building 12W)
9:45 AM: COFFEE BREAK (Grand Hall, 1/F, 12W)
10:15 AM: SESSION 6: VERIFICATION & CONTROL FOR CPS
Session Chair: Pushpak Jagtap
Robust Conformal Prediction for STL Runtime Verification under Distribution Shift
Yiqi Zhao (University of Southern California), Bardh Hoxha (Toyota), Georgios Fainekos (Toyota), Jyotirmoy Deshmukh (University of Southern California) and Lars Lindemann (University of Southern California)
An Online Planning Framework for Heterogeneous Multi-Robot Systems with LTL Specification
Rohit Singh (IIT Kanpur) and Indranil Saha (IIT Kanpur)
Control over Low-Power Wide-Area Networks,
Aakriti Jain (Wayne State University), Prashant Modekurthy (University of Nevada, Las Vegas) and Abusayeed Saifullah (Wayne State University)

11:45 PM: LUNCH (Harbourview Grill, G/F, 12E)

1:30 PM: SESSION 7: HUMAN-CENTRIC AND MEDICAL CPS
Session Chair: Abishek Dubey
FinA: Fairness of Adverse Effects in Decision-Making of Human-Cyber-Physical-System
Tianyu Zhao (University of California, Irvine) and Salma Elmalaki (University of California, Irvine)
Curating Naturally Adversarial Datasets for Learning-Enabled Medical Cyber-Physical Systems,
Sydney Pugh (University of Pennsylvania), Ivan Ruchkin (University of Florida), James Weimer (Vanderbilt University) and Insup Lee (University of Pennsylvania)
ε-Neural Thompson Sampling of Deep Brain Stimulation for Parkinson Disease Treatment
Hao-Lun Hsu (Duke University), Qitong Gao (Duke University) and Miroslav Pajic (Duke University)
3:00 PM: COFFEE BREAK
3:30 PM: Session 8: Industrial Applications
Session Chair: Yasser Shoukry
Towards Deterministic End-to-end Latency for Medical AI Systems in NVIDIA Holoscan
Soham Sinha (Nvidia), Shekhar Dwivedi (Nvidia) and Mahdi Azizian (Nvidia)
Control Corruption without Firmware Infection: Stealthy Attacks via PLC Hardware Implants
Mingbo Zhang (Hexin Science And Technology) and Saman Zonouz (Georgia Tech)
Unsafe Events Detection in Smart Water Meter Infrastructure via Noise-Resilient Learning
Ayanfeoluwa Oluyomi (Missouri S&T), Sahar Abedzadeh (Western Michigan University), Shameek Bhattacharjee (Western Michigan University) and Sajal Das (Missouri S&T)

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RTAS's conference venue or coffee break venue is Conference Hall 06+07, 2/F, Building 10W if not indicated specifically.

Tuesday, May 14th

10:15am-11:45pm, Session 1: RTAS Opening

Session Chair: Benny Akesson, TNO-ESI and University of Amsterdam, the Netherlands

Welcome to RTAS 2024 by PC Chair

Benny Akesson

IEEE TCRTS Outstanding Technical Achievement and Leadership Award Lecture

Marco Caccamo

11:45am-1:30pm, Lunch and Social

(Happiness Cuisine, 1/F, 1W)

1:30pm-3:00pm, Session 2: Scheduling and Analysis of Networked Systems

Session Chair: Anais Finzi, TTTech Computertechnik AG, Austria

USB Interrupt Differentiated Service for Bandwidth and Delay-Constrained Input/Output

Z. Ruan, A. Njavro, R. West

Real-Time Scheduling for 802.1Qbv Time-Sensitive Networking (TSN): A Systematic Review and Experimental Study

C. Xue, T. Zhang, Y. Zhou, M. Nixon, A. Loveless, S. Han

Extending Network Calculus to Deal with Min-Plus Service Curves in Multiple Flow Scenarios

A. Hamscher, V. Constantin, J. Schmitt

A Hybrid Approach to WCTT Analysis in a Real-Time Switched Ethernet Network

A. Soni, J. Scharbarg, J. Ermont

3:00pm-3:30pm Coffee Break (Grand Hall, 1/F, 12W)

3:30pm-5:30pm Poster/Demo (Grand Hall, 1/F, 12W)

Chair: Mitra Nasri, Eindhoven University of Technology, the Netherlands

Wednesday, May 15th

10:15am-11:45am, Session 3: Time-predictable Software and Systems

Session Chair: Rodolfo Pellizzoni, University of Waterloo, Canada

A Predictable SIMD Library for GEMM Routines

I. De Albuquerque Silva, T. Carle, A. Gauffriau, V. Jegu, C. Pagetti

Safe and Secure? On the Timing Analysability of Cryptographic Implementations

A. Stegmeier, P. Knauer, P. Schubaur, C. Piatka, D. Merli, S. Altmeyer

RT-Mimalloc: A New Look at Dynamic Memory Allocation for Real-Time Systems,

R. Giannessi, A. Biondi, A. Biasci

Core-Local Reasoning and Predictable Cross-Core Communication with M³

N. Asmussen, S. Haas, A. Lackorzyński, M. Roitzsch

11:45am-1:30pm, Lunch and Social

(Happiness Cuisine, 1/F, 1W)

1:30pm-3:00pm, Session 4: Fault-tolerant and Robust systems

Session Chair: Runyu Pan, Shandong University, China

Optimal Synthesis of Fault-tolerant IDK Cascades for Real-time Classification

S. Baruah, I. Bate, A. Burns, R. Davis

Sync or Sink? The Robustness of Sensor Fusion against Temporal Misalignment

D. Kuhse, N. Hölscher, M. Guenzel, H. Teper, G. von der Brüggen, J. Chen, C. Lin

TinyBFT: Byzantine Fault-Tolerant Replication for Highly Resource-Constrained Embedded Systems

H. Böhm, T. Distler, P. Wägemann

An Empirical Study of Performance Interference: Timing Violation Patterns and Impacts,

A. Li, J. Wang, S. Baruah, B. Sinopoli, N. Zhang

3:00pm-3:30pm, Coffee Break

3:30pm-5:30pm, Session 5: Resource Management

Chair: Daniel Casini, Scuola Superiore Sant'Anna, Italy

Demystifying NVIDIA GPU Internals to Enable Reliable GPU Management

J. Bakita, J. Anderson

RT-Swap: Addressing GPU Memory Bottlenecks for Real-Time Multi-DNN Inference

W. Kang, J. Lee, Y. Lee, S. Oh, K. Lee, H. Chwa

PAAM: A Framework for Coordinated and Priority-Driven Accelerator Management in ROS 2

D. Enright, Y. Xiang, H. Choi, H. Kim

Exclusive Hierarchies for Predictable Sharing in Last-level Cache,

X. Wang, Z. Wu, R. Pellizzoni, H. Patel

HAEST: Harvesting Ambient Events to Synchronize Time across heterogeneous IoT devices

A. Nasrullah, F. Anwar

Thursday, May 16th

10:15am-11:45am, Session 6: Optimizations and Trade-offs
Session Chair: Martina Maggio, Saarland University, Germany
Decntr: Optimizing Safety and Schedulability with Multi-Mode Control and Resource Allocation Co-Design
R. Gifford, F. Galarza-Jimenez, L. Phan, M. Zamani
Optimizing Logical Execution Time Model for Both Determinism and Low Latency
S. Wang, D. Li, A. Sifat, S. Huang, X. Deng, C. Jung, R. Williams, H. Zeng
End-To-End Timing Analysis and Optimization of Multi-Executor ROS 2 Systems
H. Teper, T. Betz, M. Günzel, D. Ebner, G. von der Brüggen, J. Betz, J. Chen
11:45am-1:30pm, Lunch and Social
(Harbourview Grill, G/F, 12E)
1:30pm-3:00pm, Session 7: Secure and Resilient Systems
Session Chair: Bryan Ward, Vanderbilt University, USA
Fast Attack Recovery for Stochastic Cyber-Physical Systems,
L. Zhang, L. Burbano, X. Chen, A. Cardenas, S. Drager, M. Anderson, F. Kong
InsectACIDE: Debugger-Based Holistic Asynchronous CFI for Embedded System
Y. Wang, C. Mack, X. Tan, N. Zhang, Z. Zhao, S. Baruah, B. Ward
Trusted Timing Services with TimeGuard
A. Nasrullah, F. Anwar
OmniWasm: Efficient, Granular Fault Isolation and Control-Flow Integrity for Arm Microcontrollers
M. Bai, R. Pan, G. Parmer
3:00pm-3:30pm Coffee Break

3:30pm-5:30pm, Session 8: Advances in Real-time Scheduling

Session Chair: Sanjoy Baruah, Washington University in St. Louis, USA

DAG Scheduling with Execution Groups

J. Shi, M. Guenzel, N. Ueter, G. von der Brüggen, J. Chen

Elastic Scheduling for Harmonic Task Systems

M. Sudvarg, A. Li, D. Wang, S. Baruah, J. Buhler, P. Ekberg, C. Gill, N. Zhang

Algorithms for Canvas-based Attention Scheduling with Resizing

Y. Hu, I. Gokarn, S. Liu, A. Misra, T. Abdelzaher

Strict Partitioning for Sporadic Rigid Gang Tasks

B. Sun, T. Kloda, M. Caccamo

Integrating Sporadic Events in Time-triggered Systems via Affine Envelope Approximations

A. Finzi, S. Craciunas, M. Boyer

Scan the QR Code for poster/demo instruction.

Poster/Demo Session

3:30pm - 5:30pm May 14th

Grand Hall, 1/F, 12W

Posters:

Poster Abstract: TCT: Zero-training two staged Contrastive Transformer network for SSVEP classification
Chenlong Wang, Yan Zhuo, Han Li, Xinlei Chen (Shenzhen International Graduate School, Tsinghua University, Shenzhen, Guangdong, China; Pengcheng Laboratory, Shenzhen, Guangdong, China; RISC-V International Open Source Laboratory, Shenzhen, Guangdong, China)
Poster Abstract: On the Accuracy and Robustness of Large Language Models in Chinese Industrial Scenarios
Zongjie Li (Hong Kong University of Science and Technology), Wenying Qiu, Pingchuan Ma (HKUST), Yichen Li, You Li, Sijia He, Baozheng Jiang, Shuai Wang, Weixi Gu (China Academy of Industrial Internet)
CaringFM: An Interactive In-home Healthcare System Empowered by Large Foundation Models
Haiyang Wu, Kaiwei Liu, Siyang Jiang, Zhihe Zhao, Zhenyu Yan, Guoliang Xing (The Chinese University of Hong Kong)
Shallowly Buried Trash Detection in Sandy Land Based on IR-UWB Radar
Guiyun Fan, Yongkui Zhang, Haiming Jin (Shanghai Jiao Tong University)
Uncovering Mobile User Gait Patterns Through Contactless RF Channels
Huanqi Yang (City University of Hong Kong), Xinyue Li, Jiahuan Chen (Xidian University), Mingda Han (Shandong University), Weitao Xu (City University of Hong Kong)
Poster Abstract: Text2Net: Transforming Plain Text into Dynamic, Interactive Network Simulations
Alireza Marefat, Abbaas Alif Mohamed Nishar, Ashwin Ashok (Georgia State University)
Poster Abstract: Beyond-Voice - Towards Continuous 3D Hand Pose Tracking on Commercial Home Assistant Devices
Yin Li, Rohan Reddy (Cornell Tech), Cheng Zhang, Rajalakshmi Nandakumar (Cornell University)

Poster Abstract: Ayaligo: A Programming Framework for Fast IoT System Integration
Pengfei Wang, Zhiwei Zhao (University of Electronic Science and Technology of China)
Large Social Simulator: Basic Scientific Research Equipment for Intelligent Science and Technology
Shang Liu, Weixi Gu, Hao Zhang, Peng Lu, Zhiqiang Wu (PKU-WUHAN Institute for Artificial Intelligence)
Squeezing High-Frequency Real-Time Eye Tracking on Edge with Event Cameras
Ning Chen, Yiran Shen (School of Software, Shandong University), Hongkai Wen (University of Warwick)
Poster Abstract: Emergency Networking Using UAVs: A Reinforcement Learning Approach with Large Language Model
Yanggang Xu, Zhuozhu Jian, Jirong Zha, Xinlei Chen (Shenzhen International Graduate School, Tsinghua University)/
Poster Abstract: Enhancing Human Motion Sensing with synthesized Millimeter-Waves
Xiaotong Zhang, Kun Wang (City University of Hong Kong), Zhenjiang Li (Southern University of Science and Technology), Jin Zhang (City University of Hong Kong)/
Poster Abstract: Sprinkler-UAV Cooperative Active Scheduling System
Zijian Xiao, Ji Luo, Xuecheng Chen, Yuhan Cheng, Haoyang Wang, Xinlei Chen (Shenzhen International Graduate School, Tsinghua University)
Poster Abstract: Threshold Cryptography-based Authentication Protocol for Remote Healthcare
Qipeng Xie (Hong Kong University of Science and Technology (Guangzhou)), Zhihe Zhao, Linshan Jiang (The Chinese University of Hong Kong), Siyang Jiang, Salabat Khan, Kaishun Wu, Weizheng Wang (City University of Hong Kong)
UWB Ranging with Scheduled Broken Packet Reception
Laura Tileutay, Jiwoong Park, Young-Bae Ko (Ajou University)

Poster Abstract: Joint Optical Wireless Communication and Sensing using Neuromorphic Cameras
Abbaas Alif Mohamed Nishar, Sonipriya Paul, Ashwin Ashok (Georgia State University)
Poster Abstract: Real-Time Cardiovascular Disease Detection via Abnormal Electrocardiogram Cycles on Embedded Systems
Yixin Li, Ning Sui, Anil Gehi, Chenhan Xu, Zhishan Guo (North Carolina State University)
Poster Abstract: Listen and Then Sense: Vibration-based Sports Crowd Monitoring by Pre-training with Public Audio Datasets
Yen Cheng Chang, Jesse Codling, Yiwen Dong, Jiale Zhang, Jeffrey Shulkin, Hugo Latapie, Hae Young Noh, Pei Zhang (University of Michigan)
Poster Abstract: Adaptive Chirps Domain Window Order of MM-Wave Radar for UAV Motion Capture
Yan Zhuo, Han Li, Chenlong Wang, Xinlei Chen (Shenzhen International Graduate School, Tsinghua University)
Poster Abstract: TCT: Zero-training two staged Contrastive Transformer network for SSVEP classification
Chenlong wang, Yan Zhuo, Han Li, Xinlei Chen (Shenzhen International Graduate School, Tsinghua University, Shenzhen, Guangdong, China; Pengcheng Laboratory, Shenzhen, Guangdong, China; RISC-V International Open Source Laboratory, Shenzhen, Guangdong, China)

Poster Abstract: On the Accuracy and Robustness of Large Language Models in Chinese Industrial Scenarios
Zongjie Li (Hong Kong University of Science and Technology), Wenying Qiu, Pingchuan Ma (HKUST), Yichen Li, You Li, Sijia He, Baozheng Jiang, Shuai Wang, Weixi Gu (China Academy of Industrial Internet)
CaringFM: An Interactive In-home Healthcare System Empowered by Large Foundation Models
Haiyang Wu, Kaiwei Liu, Siyang Jiang, Zhihe Zhao, Zhenyu Yan, Guoliang Xing (The Chinese University of Hong Kong)

Uncovering Mobile User Gait Patterns Through Contactless RF Channels
Huanqi Yang (City University of Hong Kong), Xinyue Li, Jiahuan Chen (Xidian University), Mingda Han (Shandong University), Weitao Xu (City University of Hong Kong)
Poster Abstract: Text2Net: Transforming Plain Text into Dynamic, Interactive Network Simulations
Alireza Marefat, Abbaas Alif Mohamed Nishar, Ashwin Ashok (Georgia State University)
Poster Abstract: Beyond-Voice - Towards Continuous 3D Hand Pose Tracking on Commercial Home Assistant Devices
Yin Li, Rohan Reddy (Cornell Tech), Cheng Zhang, Rajalakshmi Nandakumar (Cornell University)
Poster Abstract: Ayaligo: A Programming Framework for Fast IoT System Integration
Pengfei Wang, Zhiwei Zhao (University of Electronic Science and Technology of China)
Large Social Simulator: Basic Scientific Research Equipment for Intelligent Science and Technology
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Poster Abstract: Adaptive Chirps Domain Window Order of MM-Wave Radar for UAV Motion Capture
Yan Zhuo, Han Li, Chenlong Wang, Xinlei Chen (Shenzhen International Graduate School, Tsinghua University)

Demos:

Demo Abstract: A Spatio-Temporal Embedding Model for Public Transit-Guided Volunteer Task Matching
Xuzhe Wang, Chengzhao Yu, Chenyu Zhao, Xinlei Chen (Tsinghua-Berkeley Shenzhen Institute, Shenzhen International Graduate School, Tsinghua University), Chen Gao, Weichen Zhang (Tsinghua University)

Demo Abstract: CARL: Collaborative Altitude-Adaptive Reinforcement Learning for Active Search with UAV Swarms
Chen-Chun Hsia, Yanggang Xu, Jiyuan Ren, Xinlei Chen (Shenzhen International Graduate School (SIGS), Tsinghua University)

Demo Abstract: CaringFM: An Interactive In-home Healthcare System Empowered by Large Foundation Models
Haiyang Wu, Kaiwei Liu, Siyang Jiang, Zhihe Zhao, Zhenyu Yan, Guoliang Xing (The Chinese University of Hong Kong)

Demo Abstract: Underground Potato Root Tuber Sensing via a Wireless Network
Tao Wang, Yang Zhao, Jie Liu, Yujie Zhuang (Harbin Institute of Technology)

Demo Abstract: A Battery-free Wireless Keyboard
Xinyuan Chuai, Yaoyi Li, Xin Li, Daxing Zhang (Xidian University), Guobiao Hu (HKUST(Guangzhou)), Wei-Hsin Liao (CUHK)

Demo Abstract: Embodied Aerial Agent for Visual Language Navigation in City Environment
Weichen Zhang, Yuxuan Liu, Xuzhe Wang, Xuecheng Chen (Tsinghua University), Xinlei Chen, Chen Gao (Tsinghua-Berkeley Shenzhen Institute, Shenzhen International Graduate School, Tsinghua University)

Demo Abstract: Range-SLAM: UWB based Realtime Indoor Location and Mapping
Zhuozhu Jian, Junbo Tan, Houde Liu (Tsinghua University), Yi Liu (Shandong University), Lunfei Liang (Harbin Institute of Technology), Xinlei Chen (Tsinghua-Berkeley Shenzhen Institute, Shenzhen International Graduate School, Tsinghua University)
Demo Abstract: PixelGen: Rethinking Embedded Camera Systems for Mixed-Reality
Kunjun Li, Manoj Gulati, Dhairya Shah, Steven Waskito (National University of Singapore), Shantanu Chakrabarty (NCS Group), Ambuj Varshney (National University of Singapore)
Demo Abstract: An Interpretable and Trainable CTC Framework
Haoyu Wang, Xin Lv, Demin Gao (Nanjing Forestry University), Jiazhao Wang, Wenchao Jiang (Singapore University of Technology and Design)
Demo Abstract: MARS: An mmWave-based Multi-user Activity Tracking Solution
Argha Sen, Anirban Das, Sandip Chakraborty (Indian Institute of Technology Kharagpur), Swadhin Pradhan (Cisco Systems, United States of America)

Demo Abstract: Bio-inspired Tactile Sensing for MAV Landing with Extreme Low-cost Sensors
Chenyu Zhao, Ciyu Ruan, Shengbo Wang, Jirong Zha, Haoyang Wang, Jiaqi Li, Xuzhe Wang,Xinlei Chen (Shenzhen International Graduate School, Tsinghua University)
Demo Abstract: AD-CLIP: Privacy-Preserving, Low-Cost Synthetic Human Action Dataset for Alzheimer's Patients via CLIP-based Models
Heming Fu, Hongkai Chen, Guoliang Xing (The Chinese University of Hong Kong)
Demo Abstract: Sprinkler-UAV Cooperative Active Scheduling System
Zijian Xiao, Ji Luo, Yuhan Cheng, Haoyang Wang, Xinlei Chen (Shenzhen International Graduate School, Tsinghua University)

Poster Abstract: Enabling Non-contact, Low-Power Sensing using Tunnel Diodes
Yuvraj Singh Bhadauria, Lim Chang Quan Thaddeus, C. Rajashekar Reddy, Manoj Gulati, Dhairya Shah, Ambuj Varshney (National University of Singapore)
Poster Abstract: CARL: Collaborative Altitude-Adaptive Reinforcement Learning for Active Search with UAV Swarms
Chen-Chun Hsia, Yanggang Xu, Jiyuan Ren, Xinlei Chen (Shenzhen International Graduate School, Tsinghua University)
Generative Modeling of Post-Disaster POI Visits Recovery
Han Li, Yan Zhuo, chenlong wang, Huandong Wang, Xinlei Chen (Tsinghua University)
UarLogger: Logging Measurements from UWB and AR Sensors on iOS Devices
Yuyang Zhang, Xu Weng (Nanyang Technological University), KV Ling (Nanyang Technological University)
Xpi: Real-Time Progressive Inference Serving with Explainable AI in Edge-Cloud Systems
Changyao Lin (Harbin Institute of Technology), Zhenming Chen (China Construction Steel Structure Engineering Corp., LTD), Jie Liu (Harbin Institute of Technology)
Extending Schedule-Abstraction Graph for Event-Triggered Response-Time Analysis
Ruide Cao (Southern University of Science and Technology), Qinyang He (Nankai University), Yi Wang (Southern University of Science and Technology)
Enabling Concurrent Random Access in Underwater Acoustic Networks
Enqi Zhang, Lei Liang (Xiamen University), Lizhao You (Xiamen University), Zhaorui Wang (The Chinese University of Hong Kong, Shenzhen)

Posters:

Poster Abstract: Towards a Predictive Model for Improved Placement of Solar-Powered Urban Sensing Nodes
Alex Cabral, Jim Waldo (Harvard University), Amy V. Mueller (Northeastern University)

Demos:

Demo Abstract: TinyssimoRadar: In-Ear Hand Gesture Recognition with Ultra-Low Power mmWave Radars
Andrea Ronco, Philipp Schilk, Michele Magno (ETH Zurich)
Demo Abstract: EdgeCam: A Distributed Camera Operating System for Inference Scheduling and Continuous Learning
Yuqi Dong, Guanyu Gao (Nanjing University of Science and Technology)
Demo Abstract: PriviFy: Designing Tangible Interfaces for IoT Privacy Configuration
Bayan Al Muhander, Omer Rana, Charity Perera (Cardiff University)
Demo Abstract: ImmunoPlane - Middleware for Providing Adaptivity to Distributed Internet-of-Things Applications
Kumseok Jung, Gargi Mitra, Sathish Gopalakrishnan, Karthik Pattabiraman (The University of British Columbia)
Demo Abstract: PRINCE: Device Energy Estimation with a Single Photo
Farooq Dar, Mohan Liyanage, Mayowa Olapade, Zhigang Yin, Abdul-Rasheed Ottun, Adeyinka Akintola, Francisco Airton Silva (Federal University of Piauí), Huber Flores (University of Tartu, Estonia)
Demo Abstract: A Prototype for Machine Learning with Batteryless Sensors
Geffen Cooper, Tianda Huang, Radu Marculescu (The University of Texas at Austin)
Demo Abstract: Blades: A Unified Benchmark Suite for Byzantine-Resilient in Federated Learning
Shenghui Li, Edith C.-H. Ngai, Fanghua Ye, Li Ju, Tianru Zhang, Thiemo Voigt (Uppsala University, Department of Electrical Engineering)

Demo Abstract: Intermittent Edge Computing for Green Agricultural Automation

Hui-Xin Shih, Yu-An Lin, Hsu-Huai Tsai, Yuan Lin-Huang (National Taiwan University & Academia Sinica), Chih-Yu Wang (Academia Sinica)

Demo Abstract: Online Training and Inference for On-Device Monocular Depth Estimation

Allen-Jasmin Farcas, Geffen Cooper, Hyun Joon Song, Afnan Mir, Vincent Liew, Chloe Tang, Prithvi Senthilkumar, Tiani Chen-Troester, Radu Marculescu (The University of Texas at Austin)

Spatiotemporal Tubes for Reach-Avoid-Stay Specifications (Poster presentation)

Ratnangshu Das and Pushpak Jagtap, PRESENTER: Ratnangshu Das

IMPaCT: A Parallelized Software Tool for IMDP Construction and Controller Synthesis with Convergence Guarantees (Poster presentation)

Ben Wooding and Abolfazl Lavaei, PRESENTER: Abolfazl Lavaei

Temporal Behavior Trees -- Segmentation (Poster presentation)

Sebastian Schirmer, Jasdeep Singh, Emily Jensen, Johann Dauer, Bernd Finkbeiner, and Sriram Sankaranarayanan, PRESENTER: Sebastian Schirmer

Physics-Informed Neural Networks for Stability Analysis and Control with Formal Guarantees (Poster presentation)

Jun Liu, Yiming Meng, Maxwell Fitzsimmons, and Ruikun Zhou, PRESENTER: Jun Liu

MULTIGAIN 2.0: MDP Controller Synthesis for Multiple Mean-Payoff, LTL and Steady-State Constraints (Poster presentation)

Severin Sais, Alexandros Evangelidis, Jan Kretinsky, and Jakob Waibel, PRESENTER: Jakob Waibel

Safety Certificates of Stochastic Cyber-Physical Systems with Wireless Communication Networks (Poster presentation)

Omid Akbarzadeh and Abolfazl Lavaei, PRESENTER: Abolfazl Lavaei

Poster:

Achieving Real-time Visual Tracking with Low-Cost Edge AI
Van Minh Do (Nanyang Technological University), Meiqing Wu (Nanyang Technological University), Siew-Kei Lam (Nanyang Technological University), Thambipillai Srikanthan (Nanyang Technological University)

Landing-Type Aware Multi-Drone Route Generation for Last-Mile Delivery Service
Jihyun Kwon (DGIST), Baekgyu Kim (DGIST), Yi-Ying Chen (National Taiwan University), Chung-Wei Lin (National Taiwan University)

Multi-Agent System for Optimizing Victim Tagging in Human/Autonomous Responder Teams
Maria A. Cardei (University of Virginia), Afsaneh Doryab (University of Virginia)

Digital-twin-based Decision Support During Personalized Robotic Rehabilitation
Yilun Chen (ShanghaiTech University), Zhuo Jian (ZD Medtech), Yixi Wang (ZD Medtech), Zhihao Jiang (ShanghaiTech University)

Neural Architecture Sizing for Autonomous Systems
Shengjie Xu (The University of North Carolina at Chapel Hill), Clara Hobbs (The University of North Carolina at Chapel Hill), Yukai Song (University of Pittsburgh), Bineet Ghosh (The University of Alabama), Sharmin Aktar (The University of North Carolina at Chapel Hill), Lei Yang (George Mason University), Yi Sheng (George Mason University), Weiwen Jiang (George Mason University), Jingtong Hu (University of Pittsburgh), Parasara Sridhar Duggirala (The University of North Carolina at Chapel Hill), Samarjit Chakraborty (The University of North Carolina at Chapel Hill)

Adaptive Protection of Power Grids against Stealthy Load Alterations
Anjana Balabhaskara (Indian Institute of Technology Kharagpur), Sunandan Adhikary (Indian Institute of Technology Kharagpur), Ipsita Koley (Indian Institute of Technology Kharagpur), Soumyajit Dey (Indian Institute of Technology Kharagpur), Ashish R. Hota (Indian Institute of Technology Kharagpur)

Assuring LLM-Enabled Cyber-Physical Systems
Weizhe Xu (University of Notre Dame), Mengyu Liu (University of Notre Dame), Steven Drager (US Air Force), Matthew Anderson (US Air Force), Fanxin Kong (University of Notre Dame)

Signal Temporal Logic Compliant Motion Planning using Reinforcement Learning
Vaishnavi J (Indian Institute of Science), Tushar Dilip Kurne (Indian Institute of Science), Manas Sashank Juvvi (Indian Institute of Science), Pushpak Jagtap (Indian Institute of Science)

Demo:

Iterative Model Checking for Safety-Critical Problems in Cyber-Physical Systems
Guangyao Chen (ShanghaiTech University), Zhihao Jiang (ShanghaiTech University)

Playground, A Safe Building Operating System
Xiaohan Fu (University of California San Diego), Yihao Liu (Nanyang Technology University), Jason Koh (Mapped), Dezhi Hong (Amazon), Rajesh Gupta (University of California San Diego), Gabe Fierro (Colorado School of Mines)

Work in Progress: Predictable Execution of Isolated Real-Time Tasks on Multicore Systems Using the LET Paradigm
K. Dudzik, M. Kirschner, V. Betancourt, J. Becker

Work in Progress: Early Timing Prediction of Real-time Tasks in Continuous Integration Environments
P. Huang, B. Maag, T. Sivanthi, C. Xing

Work in Progress: Guaranteeing weakly-hard timing constraints in server-based real-time systems
N. Samimi, M. Nasri, T. Basten, M. Geilen

Journal-first: Edge Generation Scheduling for DAG Tasks Using Deep Reinforcement Learning
B. Sun, M. Theile, Z. Qin, D. Bernardini, D. Roy, A. Bastoni, M. Caccamo

Work in Progress: Emerging From Shadows: Optimal Hidden Actuator Attack to Cyber-Physical Systems
M. Miji, M. Liu, F. Akowuah, F. Kong

Journal First: Impact of Priority Assignment on Schedule-Based Attacks in Real-Time Embedded Systems
S. Karin, H. Aydin, D. Zhu, S. Drager, M. Anderson

Brief Industry Paper: Delay-Aware Control in Networked Systems Using Smart Actuators
P. Pazzaglia, C. Mark, B. Pourmohseni, F. Smirnov, K. Schmidt, L. Beermann

Demo: Vulnerability Analysis for STL-Guided Safe Reinforcement Learning in Cyber-Physical Systems
S. Jiang, M. Liu, F. Kong

Programs of Workshop Day & Competitions

Workshop Day Program Overview

Monday | May 13, 2024

Venue/Time	8:00am-8:30am	8:30am-9:45am	9:45am–10:15am	10:15am-11:45pm	11:45pm–1:30pm	1:30pm-3:00pm	3:00pm-3:30pm	3:30pm-5:30pm
	Breakfast (Grand Hall, 1/F, Building 12W)	Paper Session	Coffee Break	Paper Session	Lunch	Paper Session	Coffee Break	Paper Session
Grand Hall A, 1/F, 12W		ACM SIGBED China workshop on next-generation Internet of Things: from Embedded to General AI (NIoT 2024)						
Grand Hall B, 1/F, 12W		International Workshop on Foundation Models for Cyber-Physical Systems & Internet of Things (FMSys)						
Function Hall, 1/F, 12W		Coupling of Sensing & Computing in AIoT Systems (CSCAIoTSys)				The 3rd Workshop on Machine Learning on Edge in Sensor Systems (SenSys-ML 2024)		
Conference Hall 04, 2/F, 10W		Competition: The 3rd Student Design Competition on Networked Computing on the Edge				Tutorial: Rapid Prototyping Using Tock In Cyber-Physical Systems (RUSTIC)		
Conference Hall 05, 2/F, 10W		The 3rd international workshop on Real-time And intelliGent Edge computing (RAGE)						
Conference Hall 06, 2/F, 10W		The 4th Workshop on Computation-Aware Algorithmic Design for Cyber-Physical Systems (CAADCPS)						
Conference Hall 07, 2/F, 10W		Tutotial: Enhancing CPS Data Reproducibility						
Pre-Function Hall, 1/F, 10W		Competition: F1TENTH Autonomous Grand Prix						
Multi-Function Room 1, 2/F, INNO2, 17W		The 6th Workshop on Design Automation for CPS and IoT (DESTION)						
Multi-Function Room2+3, 2/F, INNO2, 17W		The Workshop on Crystal-Free/-Less Radio and System-based Research for IoT (CrystalFreeIoT)						
Studio, 2/F, INNO2, 17W						IPSN PhD Forum		

***Coffee break &lunch will be provided outside each conference room.**

Detailed Programs of Workshops, Tutorials, Competitions and IPSN PhD-Forum

The 3rd international workshop on Real-time And intelliGent Edge computing (RAGE)

The printed version is provided for your reference only. To access the most up-to-date program, please scan the QR code or visit the official website.

- **RAGE's conference venue or coffee break venue is Conference Hall 05, 2/F, Building 10W if not indicated specifically.**
- **Lunch on May 13th is provided outside each conference room.**

8:00am - 8:30am Breakfast

8:30am - 8:45am Welcome message from the organizers

8:45am - 9:15am Invited Talk:

Ensuring Cyber-Physical System Stability in the Presence of Deadline Misses

Prof. Martina Maggio, Saarland University, Germany

9:15am-9:45am Invited Talk:

When AI Meets Real-Time: Real-Time Scheduling Framework for Multi-DNN Inference

Prof. Hoon Sung Chwa, Daegu Gyeongbuk Institute of Science and Technology, South Korea

9:45am - 10:15am Coffee Break

10:15am - 10:45am Session 1: Edge-based Perception

10:15am - 10:30am

3D Point Cloud Object Detection on Edge Devices for Split Computing

Taisuke Noguchi, Takuya Azumi

Towards a Real-Time and Energy-Efficient Edge AI Camera Architecture in Mega Warehouse Environment

Yusuke Asai, Yuki Mori, Keisuke Higashiura, Kodai Yokoyama, Shin Katayama, Kenta Urano, Takuro Yonezawa, Nobuo Kawaguchi

11:15am - 11:45am Invited Talk:

Understanding and Mitigating Hardware Interference Channels on Heterogeneous Multicore

Prof. Heechul Yun, University of Kansas, KS, USA

11:45am - 13:30 am Lunch

1:30pm - 2:00pm Session 2: Model-based and Virtualized Edge Computing

1:30pm - 1:45pm

Energy Consumption Prediction Framework in Model-based Development for Edge Devices

Yue Hou, Takuya Azumi

1:45pm - 2:00pm

Period Estimation for Linux-based Edge Computing Virtualization with Strong Temporal Isolation

Luca Abeni, Tommaso Cucinotta, Daniel Casini

2:00pm-2:30pm Invited Talk:

Towards Zero-Trust Hardware Architectures in Safety and Security Critical System-on-Chips

Dr. Francesco Restuccia, University of California San Diego, CA, USA

2:30pm - 3:00pm Invited Talk:

Building a Cyber-Physical Edge Cloud Continuum
Dr. Dirk Ziegenbein, Bosch Corporate Research, Germany

3:00pm - 3:30pm Coffee Break

3:30pm - 4:00pm Session 3: Learning at the Edge

3:30pm - 3:45pm

Federated Learning Platform on Embedded Many-core Processor with Flower

Masahiro Hasumi, Takuya Azumi

3:45pm - 4:00pm

Evaluating the Energy Efficiency of Few-Shot Learning for Object Detection in Industrial Settings
Georgios Tsoumplekas, Vladislav Li, Ilias Siniosoglou, Vasileios Argyriou, Sotirios Goudos, Ioannis Moscholios, Panagiotis Radoglou-Grammatikis, Panagiotis Sarigiannidis

4:00pm - 4:30pm Invited Talk:

5G-enabled Next Generation Internet of Things

Prof. Panagiotis Sarigiannidis, University of Western Macedonia, Greece

4:30pm - 5:00pm Invited Talk:

Challenges on the Automotive Edge

Jörg Seitter, Infineon Technologies, Germany

5:00pm - 5:30pm Open Discussion

5:30pm - 5:45pm Closing Remarks

6:00pm - 8:00pm Reception

International Workshop on Foundation Models for Cyber-Physical Systems & Internet of Things (FMSys)

The printed version is provided for your reference only. To access the most up-to-date program, please scan the QR code or visit the official website.

- **FMSys's conference venue or coffee break venue is Grand Hall B, 1/F, Building 12W if not indicated specifically.**
- **Lunch on May 13th is provided outside each conference room.**

8:50am - 9:00am Introduction to FMSys

9:00am - 10:00am Keynote

9:45am–10:15am Coffee Break

10:30am - 12pm Paper Session 1:

Multimodal Foundation Models for CPS-IoT Applications

CoRAST: Towards Foundation Model-Powered Correlated Data Analysis in Resource-Constrained CPS and IoT
Yi Hu (CMU), Jinhang Zuo (California Institute of Technology & University of Massachusetts Amherst), Alanis Zhao (CMU), Bob Iannucci (Google), Carlee Joe-Wong (CMU)

On the Efficiency and Robustness of Vibration-based Foundation Models for IoT Sensing: A Case Study
Tomoyoshi Kimura, Jinyang Li, Tianshi Wang, Denizhan Kara, Yizhuo Chen, Yigong Hu, Ruijie Wang (UIUC, Maggie Wigness (US Army Research Labs), Shengzhong Liu (Shanghai Jiao Tong Univeristy). Mani Srivastava, Suhas Diggavi (UCLA), Tarek Abdelzaher (UIUC)

Sensor2Scene: Foundation Model-driven Interactive Realities
Yunqi Guo(CUHK), Kaiyuan Hou (Columbia University), Zhenyu Yan, Hongkai Chen, Guoliang Xing (CUHK), Xiaofan Jiang (Columbia University)

NetBench: A Large-Scale and Comprehensive Network Traffic Benchmark Dataset for Foundation Models
Chen Qian, Xiaochang Li (William & Mary), Qineng Wang (Zhejiang University), Gang Zhou, Huajie Shao (William & Mary)

11:45pm–1:30pm Lunch

1:30pm - 3pm Paper Session 2:

LLM for Human-centric applications

An LLM-Based Digital Twin for Optimizing Human-in-the Loop Systems

Hanqing Yang (CMU), Marie Siew (SUTD), Carlee Joe-Wong (CMU)

VIAssist: Adapting Visual Large Language Models for Visual Impairment

Bufang Yang, Lixing He, Kaiwei Liu, Zhenyu Yan (The Chinese University of Hong Kong)

HARGPT: Are LLMs Zero-Shot Human Activity Recognizers?

Xinzhe Zheng, Sijie Ji, Chenshu Wu (The University of Hong Kong)

Exploring Foundation Models in Detecting Concerning Daily Functioning in Psychotherapeutic Context based on Images from Smart Home Devices

Yuang Fan, Jingping Nie (Columbia University), Xinghua Sun (University of Washington), Xiaofan Jiang (Columbia University)

3:00pm - 3:30pm Coffee break

3:30pm - 4:30pm Panel Discussion

4:30pm - 5:10pm Paper Session 3:

Survey and BenchMark

LLM-enabled Cyber-Physical Systems: Survey, Research Opportunities, and Challenges

Weizhe Xu, Mengyu Liu, Fanxin Kong (University of Notre Dame), Oleg Sokolsky, Insup Lee (University of Pennsylvania)

The Rise of Large Language Models in the Medical Field: A Bibliometric Analysis

Wenhao Qi, Shihua Cao, Bin Wang, Danni He, Xiaohong Zhu, Chaoqun Dong, Bingsheng Wang, Yankai Shi, Yanfei Chen (Hangzhou Normal University)

6:00 pm - 8:00pm Reception

The 3rd Workshop on Machine Learning on Edge in Sensor Systems (SenSys-ML 2024)

The printed version is provided for your reference only. To access the most up-to-date program, please scan the QR code or visit the official website.

- **SenSys-ML 2024's conference venue or coffee break venue is Function Hall, 1/F, Building 12W if not indicated specifically.**
- **Lunch on May 13th is provided outside each conference room.**

11:45am – 1:30pm Lunch

1:30pm -1:35 pm Introduction to Sensys-ML

1:35pm - 2:30 pm

Tutorial: Towards Robust and Heterogeneous Federated Learning

Dr Edith C.H. Ngai (The University of Hong Kong)

2:35pm - 3:00pm

LLMSense: Harnessing LLMs for High-level Reasoning Over Spatiotemporal Sensor Traces

Xiaomin Ouyang (University of California, Los Angeles),

Mani Srivastava (University of California, Los Angeles & Amazon AWS AI Labs),

3:00pm -3:30pm Coffee Break

3:30pm - 4:00pm

FACC: A Flexible and Asynchronous Updating Strategy for Cooperative Edge Caching

Zeming Gao (Beijing University of Posts and Telecommunications),

Ye Tian (Beijing University of Posts and Telecommunications),

Mengyu Yang (Beijing University of Posts and Telecommunications),

Edith C.H. Ngai (The University of Hong Kong),

Lanshan Zhang (Beijing University of Posts and Telecommunications),

Wendong Wang (Beijing University of Posts and Telecommunications, P.R. China),

4:05pm - 4:30pm

Resource-Aware Split Federated Learning for Edge Intelligence

Amna Arouj (Queen Mary University of London),

Ahmed M. Abdelmoniem (Queen Mary University of London),

Ahmad Alhilal (The Hong Kong University of Science and Technology),

Linlin You (Sun Yat-Sen University),

Chen Wang (Huazhong University of Science and Technology),

4:35pm - 5:00pm

Advancements in Machine Learning in Sensor Systems: Insights from Sensys-ML and TinyML Communities

Poonam Yadav (University of York)

5:00pm - 5:30 pm Invited talk / Closing remark

The Workshop on Crystal-Free/-Less Radio and System-based Research for IoT (CrystalFreeIoT)

The printed version is provided for your reference only. To access the most up-to-date program, please scan the QR code or visit the official website.

- **CrystalFreeIoT's conference venue or coffee break venue is Multi-Function Room 2+3, 2/F, INNO2, Building 17W if not indicated specifically.**
- **Lunch on May 13th is provided outside each conference room.**

8.30 – 8.45am Opening remarks (Tengfei Chang)

Session 1: Calibration in Crystal-Free IoT systems

8.45am – 9.45am (Lead: Tengfei Chang/David Burnett)

A Tutorial on Frequency Stability Fundamentals.

Haziq Rohail and David Burnett

Electromagnetic Side Channel Leakage Improvements Using Free-Running Oscillator Clock Reference

Jacob Louie, Sara Faour and David Burnett

9.45am – 10.15am Coffee break

10.15am – 11.45am

Inter-Cal: Inter-Oscillator Calibration for Crystal-free Mote-on-Chip

Yuanming Luo, Jie He, David Burnett, Filip Maksimovic, Thomas Watteyne, Kristofer Sj Pister and Tengfei Chang

SCμM-V23: Towards A Crystal-Free System-On-Chip For IoT In 16nm

Daniel Lovell, Titan Yuan, Yu-Chi Lin, Maithili Bapat, Rami Hijab, Julian Maravilla, Neelesh Ramachandran, Elisa Krause, Nagesh Patle, Stephen Chung, Yun-Chieh Lee, Yuqi He, Awani Khodkumbhe, Matthew Tran, Jero Wang, Daniel Endraws, Qiutong Jin, Kevin Lu, Shrey Aeron, Dang Le, Tarik Fawal, Rigoberto Gonzalez-Serrano, Borivoje Nikolić, Ali M. Niknejad and Kristofer S.J. Pister.

Demo: Simultaneous Localization and Clock Calibration for Crystal-Free Mote

Cheng Wang, Tengfei Chang, Said Alvarado-Marin, David Burnett, Filip Maksimovic, Thomas Watteyne and Kristofer Pister.

11.45am – 1.30pm Lunch

Session 2: Security, Networking and Applications of IoT

1.30pm – 3.00 pm (Lead: Thomas Watteyne/Filip Maksimovic)

Single-Chip Motes and SRAM PUF: Feasibility Study

Sara Faour, Blaz Korecic, Malisa Vucinic, Filip Maksimovic, David Burnett, Paul Muhlethaler and Thomas Watteyne.

ABL: Leveraging Millimeter Wave Pulses for Low Latency IoT Networking

Bingwu Fang, Jonathan Oostvogels, Xinlei Liu, Sam Michiels, Danny Hughes, Jeroen Famaey and Andrey Belogaev.

RobOTAP: Over-the-Air Programming of Robotic Swarms

Alexandre Abadie, Said Alvarado-Marin, Filip Maksimovic, Mališa Vučinić and Thomas Watteyne.

3.00 pm – 3.30 pm Coffee Break

Session 3: Open Discussion

3.30pm – 5.30pm (Lead: Everyone)

The future research ideas, potential collabrations….

CPS-IoT Week Reception

6.00pm – 7.00pm CrystalFreeIoT Dinner

7.00pm – 9.00pm Dinner

Coupling of Sensing & Computing in AIoT Systems (CSCAIoTSys)

The printed version is provided for your reference only. To access the most up-to-date program, please scan the QR code or visit the official website.

- **CSCAIoTSys's conference venue or coffee break venue is Function Hall, 1/F, Building 12W if not indicated specifically.**
- **Lunch on May 13th is provided Outside each conference room.**

CPS-IoT Week 2024 Workshop on Coupling of Sensing & Computing in AIoT Systems

			Chair
8:30-8:35	**Opening Speech**	Bin Guo	
8:35-9:15	**Keynote 1**	Chenren Xu	Sicong Liu
9:15-9:55	**Keynote 2**	Song Han	Sicong Liu
9:55-10:45	**Panel: Embedded AI for Science**	Lei Yang Mengdi Han Jiajie Peng Chenshu Wu Zhenyu Yan	Zimu Zhou
10:45-11:05	**Accepted Paper Session I** ***1. EarDA: Towards Accurate and Data-Efficient Earable Activity Sensing*** *Shengzhe Lyu, Yongliang Chen, Di Duan, Renqi Jia, Weitao Xu (Department of Computer Science, City University of Hong Kong, Hong Kong, China)* ***2. AdaFlow: Non-blocking Inference with Heterogeneous Multi-modal Mobile Sensor Data*** *fengmin wu, sicong liu, bin guo, xiaochen li, yuan gao, zhiwen yu (Northwestern Polytechnical University)* ***3. Accelerating Distributed Tracing in Serverless Computing Using Differential Tracing*** *Yuhan Yang, Xingda Wei (Shanghai Jiao Tong University)* ***4. Are You Being Tracked? Discover the Power of Zero-Shot Trajectory Tracing with LLMs!*** *Huanqi Yang (City University of Hong Kong); Sijie Ji (The University of Hong Kong); Rucheng Wu, Weitao Xu (City University of Hong Kong)*		Xingda Wei
11:05-11:25	**Accepted Paper Session II** ***5. Low-latency MLLM Inference with Spatiotemporal Heterogeneous Distributed Multimodal Data*** *Xiangrui Xu, Sicong Liu (Northwestern Polytechnical University); Zhiwen Yu (Northwestern Polytechnical University and Harbin Engineering University); Lehao Wang, Bin Guo (Northwestern Polytechnical University)* ***6. Poster:Research on multi-feature fusion false review detection based on DistilBERT-BiLSTM-CNN*** *Huang Ke* ***7. Poster: Enabling Environment-Aware And Task-Oriented Communication for Low-Latency Edge SLAM*** *Yao Zhang (Northwestern Polytechnical University)*		Zhidan Liu

The 4th Workshop on Computation-Aware Algorithmic Design for Cyber-Physical Systems (CAADCPS)

The printed version is provided for your reference only. To access the most up-to-date program, please scan the QR code or visit the official website.

- **CAADCPS's conference venue or coffee break venue is Conference Hall 06, 2/F, Building 10W if not indicated specifically.**
- **Lunch on May 13th is provided outside each conference room.**

8:00am-8:30am	Breakfast
9:00am – 9:15am	Welcome
9:15am – 10:00am	Lars Lindemann, University of Southern California, USATitle: **Safe Control of Learning-Enabled Autonomous Systems using Conformal Prediction**
10am –10:30am	Coffee break
10:30am – 11:15am	Yasser Shoukry, University of California, Irvine, USATitle: **Assured Perception and Control of Autonomous Systems Using Formal Verification of Neural Networks**
11:15am – 12:00pm	Martina Maggio, Saarland University, USATitle: **Towards the Verification of Cyber-Physical Systems under Timing Anomalies**
11:45pm – 1:30pm	Lunch
1:30pm-2:15pm	Lothar Thiele, ETH Zurich, SwitzerlandTitle: **Computation-Aware Resilience: From Predictability to the Era of Machine Learning**
2:15am – 3:00pm	Indranil Saha, Indian Institute of Technology Kanpur, IndiaTitle: **Model-free and specification-driven synthesis of feedback controllers using reinforcement learning**
3pm – 3:30pm	Coffee break
3:30pm-4:15pm	Oleg Sokolsky, University of Pennsylvania, USATitle: **Complementary design-time and run-time guarantees for safe CPS**
4:15pm-5:00pm	Sriram Sankaranarayanan, University of Colorado Boulder, USATitle: **Computation-Aware Synthesis of Control Lyapunov and Barrier Functions**
5:00pm-5:45pm	Samarjit Chakraborty, The University of North Carolina at Chapel Hill, USATitle: **Probabilistic Methods for Synthesizing Safe CPS Implementations**
5:45pm-6:00m	Closing Remark
6pm - 8pm	Reception

The 6th Workshop on Design Automation for CPS and IoT (DESTION)

The printed version is provided for your reference only. To access the most up-to-date program, please scan the QR code or visit the official website.

- **DESTION's conference venue or coffee break venue is Multi-Function Room 1, 2/F INNO2, Building 17W if not indicated specifically.**
- **Lunch on May 13th is provided outside each conference room.**

Time	Title
8:00am – 8:30am	Breakfast
8:30am – 8:45am	Welcome Remarks Dr. Himanshu Neema [Vanderbilt University, USA, Chair, DESTION 2024]
8:45am – 9:45am	Invited Talk: Human+AI Collaboration in Design: A Tool, A Teammate, A Coach Dr. Christopher McComb [Associate Professor, Carnegie Mellon University, USA]
9:45am –10:15am	Coffee Break
10:15am – 10:45am	Invited Talk: Towards Trustworthy Cyber-Physical System using Automation and Neuro-Symbolic AI Dr. Rickard Ewetz [Associate Professor, University of Central Florida, USA]
10:45am – 11:05am	Fusion of ML with Numerical Simulation for Optimized Propeller Design Authors: *Harsh Vardhan, Neha Kumari, Peter Volgyesi, and Janos Sztipanovits* Presenter: Dr. Harsh Vardhan [Vanderbilt University, USA]
11:05am – 11:25am	RAMPART: Reinforcement Against Malicious Penetration by Adversaries in Realistic Topologies Authors: *Himanshu Neema, Daniel Balasubramanian, Harsh Vardhan, Harmon Nine, and Sandeep Neema* Presenter: Dr. Daniel A. Balasubramanian [Vanderbilt University, USA]
11:25am – 11:45am	Libpanda Apps: Managing the Deployment and Reuse of a Cyber-Physical System Authors: *Matt Bunting, Matt Nice, Alex Richardson, Jonathan Sprinkle, and Dan Work* Presenter: Dr. Matt Bunting [Vanderbilt University, USA]
11:45pm – 1:30pm	Lunch

The 6th Workshop on Design Automation for CPS and IoT (DESTION)

1:30pm – 2:00pm	Invited Talk: (Executable) Digital Twins: The Innovation Backbone of the Future Dr. Dirk Hartmann [Siemens Technical Fellow, Siemens Digital Industries Software, Munich, Germany]
2:00pm – 2:20pm	Scalable HLA Co-Simulations of Connected and Automated Vehicles using Aggregation of Virtual Federates Authors: *Himanshu Neema, Harmon Nine, Thomas Roth, and Wenqi Guo* Presenter: Dr. Thomas Roth [National Institute of Standards and Technology (NIST), USA]
2:20pm – 2:40pm	Anvil: An integration of artificial intelligence and sampling techniques with combined CAD-CFD tool Authors: *Harsh Vardhan, Umesh Timalsina, Michael Sandborn, David Hyde, Peter Volgyesi, and Janos Sztipanovits* Presenter: Dr. Harsh Vardhan [Vanderbilt University, USA]
2:40pm – 3:00pm	Demo: Realistic and Lightweight Cyber Agent Training Environment using Network Emulation in Mininet Authors: *Chih-Ting Yeh, Himanshu Neema, and Daniel Balasubramanian* Presenter: Chih-Ting Yeh [Vanderbilt University, USA]
3:00pm – 3:30pm	Coffee Break
3:30pm – 4:00pm	Invited Talk: Injecting Traffic Rules in AI-Powered Autonomous Vehicles Dr. Sushant Veer [Research Scientist, NVIDIA, USA]
4:00pm – 4:30pm	Invited Talk: Disentangling Perception and Decision Uncertainty for Visual Planning with Multimodal Foundation Models Dr. Ufuk Topcu [Professor, University of Texas at Austin, USA]
4:30pm – 4:50pm	Model-based Design Tool for Cyber-physical Power Systems using SystemC-AMS Authors: *Rahul Bhadani, Satyaki Banik, Hao Tu, Srdjan Lukic and Gabor Karsai* Presenter: Dr. Rahul Bhadani [University of Alabama, Huntsville, USA]
4:50pm – 5:00pm	Short Break
5:00pm – 5:20pm	A Signal Injection Attack Against Zero Involvement Pairing and Authentication for the Internet of Things Authors: *Isaac Ahlgren, Jack West, Kyuin Lee, George Thiruvathukal, and Neil Klingensmith* Presenter: Isaac Ahlgren [Loyola University, Chicago, USA]
5:20pm – 5:40pm	Towards Fairness-aware Crowd Management System and Surge Prevention in Smart Cities Authors: *Yixin Zhang, Tianyu Zhao and Salma Elmalaki* Presenter: Tianyu Zhao [University of California, Irvine, USA]
5:40pm – 5:55pm	Short Paper: A Position Paper on Transforming Embedded Real-Time Systems to the Cloud: Challenges and New Research Directions Authors: *Mitra Nasri and Jeroen Voeten* Presenter: Dr. Mitra Nasri [Eindhoven University of Technology (TU/e), Netherlands]
5:55pm – 6:00pm	Closing Remarks
6:00pm – 8:00pm	Reception

ACM SIGBED China workshop on next-generation Internet of Things: from Embedded to General AI (NIoT 2024)

The printed version is provided for your reference only. To access the most up-to-date program, please scan the QR code or visit the official website.

- **ACM SIGBED China workshop's conference venue or coffee break venue is Grand Hall A, 1/F, Building 12W if not indicated specifically.**
- **Lunch on May 13th is provided Outside each conference room.**

8:30-8:35 AM Opening: Jie Liu

8:35-8:40 AM Annoucement: Guoliang Xing

8:40-9:30 AM Keynote 1: Tarek Abdelzaher (host: Jie Liu)

Title: *Towards Foundation Models for Intelligent Embedded Sensing*

Abstract: As embedded computing increases its reliance on AI, a key challenge in building modern embedded applications becomes in the high cost of acquiring labeled training data. To reduce this cost, this talk discusses advances in exploiting unlabeled training data instead. The exploitation of unlabeled data at scale for AI training has been very successful in other contexts, such as pre-training of Large Language Models (e.g., ChatGPT) and Visual Language Models. However, the pretraining infrastructure for models in the natural language and vision domains is not necessarily best-suited for data modalities common to embedded Edge AI applications, such as numeric time-series data. Similarly, the tasks executed by embedded Edge AI applications often differ from those expected of Large Language Models. The talk discuses recent work on adapting self-supervised pre-training solutions originating from the language and vision domains to the needs of intelligent embedded applications, as well as initial evaluation of the efficacy and robustness of such adapted solutions at executing CPS/IoT tasks. We show how new foundation models can be developed for the CPS/IoT space that improve the efficacy and robustness of Edge AI, while minimizing the need for labeled data. Talk concludes with further opportunities and challenges in developing foundation models for intelligent embedded sensing.

9:30-10:20 AM Keynote 2

10:20-11:20 AM Panel 1: "Foundation Model for Wireless Sensing"

Panelist: Jiannong Cao, Rong Zheng, Wen Hu, Nan Guan, Xiaofan Jiang, George C. Polyzos

11:20-11:40 AM Invited speech 1: Dongyao Chen

Title: Revealing Fine-grained Information with Magnetic Sensing

11:40-12:00 AM Invited speech 2: Xianjin Xia

Title: LoRa for Massive IoT Connections: Are We There Yet?

12:00 AM – 2:00 PM Lunch break

2:00-2:50 PM Keynote 3: Naijun Zhan

2:50-3:40 PM Keynote 4: Lili Qiu

Title: *The Future of Healthcare Powered by AI & Wireless Sensing*

Abstract: The multifaceted nature of individual health can be captured using an array of physiological and behavioral indicators, including but not limited to respiratory patterns, cardiac rhythms, neural activity as evidenced by brain waves, articulation and linguistic nuances, kinesthetic dynamics, and the intricate details captured in medical imaging. This talk will present innovative wireless sensing and advanced machine learning technologies, which have the potential to transform daily health monitoring and revolutionize the accuracy and efficiency of disease diagnosis. Furthermore, the talk will share the valuable lessons we have learned through our collaboration with leading hospitals.

3:40-4:40 PM

Panel 2: "大模型时代的嵌入式智能"(Embedded AI in the era of LLM)

Chair: Bin Guo

Panelist: Jie Liu, Xiangyang Li, Mo Li，Yanyong Zhang, Chenren Xu, Qian Zhang, Wenbo He

4:50-5:10 PM Invited speech 3: Chenshu Wu

Title: In-Cabin Automotive AI via Statistical Acoustic Sensing

5:10-5:30 PM Invited speech 4: Sicong Liu

Title: Enabling Resource-efficient mobile and embedded System with cross-level optimization

F1/10TH AUTONOMOUS RACE COMPETITION PROGRAM

The printed version is provided for your reference only. To access the most up-to-date program, please scan the QR code or visit the official website.

- **F1/10TH's venue is Pre-Function Hall, 1/F, 10W if not indicated specifically.**

DATE	IN-PERSON COMPETITION
May 13th	Track Setup
May 14th	Test Day
May 15th	Qualification Session
May 16th	Race day Award Ceremony

---------- Specific Participating Teams and Schedule ----------

14 May – **Test Day**

Morning of 14 May	
Mobinets (UESTC)	10:00–10:20
CDSL_UOS (University of Seoul)	10:20–10:40
FSM Speed (CityU)	10:40–11:00
AART (SDSU)	11:00–11:20
deepSpeed NTU (NTU)	11:20–11:40
HIT-AIOT (HIT)	11:40–12:00
KU-CSL (KU)	12:00–12:20
AGV_IITKGP (Indian Institute of Technology Kharagpur)	12:20–12:40
Afternoon of 14 May	
Mobinets (UESTC)	13:00-13:40
CDSL_UOS (University of Seoul)	13:40-14:20
FSM Speed (CityU)	14:20-15:00
AART (SDSU)	15:00-15:40
deepSpeed NTU (NTU)	15:40-16:20
HIT-AIOT (HIT)	16:20-17:00
KU-CSL (KU)	17:00-17:40
AGV_IITKGP (Indian Institute of Technology Kharagpur)	17:40-18:20

F1/10TH AUTONOMOUS RACE COMPETITION PROGRAM

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- **F1/10TH's venue is Pre-Function Hall, 1/F, 10W if not indicated specifically.**

15 May - **Time Trial**

Morning of 15 May	
Mobinets (UESTC)	10:00–10:10
CDSL_UOS (University of Seoul)	10:10–10:20
FSM Speed (CityU)	10:20–10:30
AART (SDSU)	10:30–10:40
deepSpeed NTU (NTU)	10:40–10:50
HIT-AIOT (HIT)	10:50–11:00
KU-CSL (KU)	11:00–11:10
AGV_IITKGP (Indian Institute of Technology Kharagpur)	11:10–11:20
Afternoon of 15 May	
Mobinets (UESTC)	15:00-15:10
CDSL_UOS (University of Seoul)	15:10-15:20
FSM Speed (CityU)	15:20-15:30
AART (SDSU)	15:30-15:40
deepSpeed NTU (NTU)	15:40-15:50
HIT-AIOT (HIT)	15:50-16:00
KU-CSL (KU)	16:00-16:10
AGV_IITKGP (Indian Institute of Technology Kharagpur)	16:10-16:20

16 May – **Head to head race**

Morning of 16 May		
The first round	R1: #1 vs. #8	10:00–10:20
	R2: #2 vs. #7	10:20–10:40
	R3: #3 vs. #6	10:40–11:00
	R4: #4 vs. #5	11:00–11:20
The second round	R5: R1(W) vs. R4(W)	11:30–11:50
	R6: R2(W) vs. R3(W)	11:50–12:10
Birth of the Third Place	R7: R5(L) vs. R6(L)	12:20–12:40
Birth of the Champion & Runner Up	R8: R5(W) vs. R6(W)	12:40–13:00
Award ceremony	13:00–13:10	

The 3rd Student Design Competition on Networked Computing on the Edge

The printed version is provided for your reference only. To access the most up-to-date program, please scan the QR code or visit the official website.

- **The venue is Conference Hall 04, 2/F, 10W if not indicated specifically.**

08:45~09:00: Opening Remarks

09:00~09:15:

A Distributed RGB-D Camera Aided Dynamic Object Filter for 2D LiDAR SLAM

- Team Members: Vishwaak Thamaraiselvan, Suyog Neupane

- Advisor: Jiajian Chang

- Affiliation: University of Texas at Arlington

09:15~09:30: Integration of Intelligent Mobile Robot and Robotic Arm for Urban and Residential Deliveries

- Team Members: He Yang, Hongsen Chen, Yibo Wang

- Advisors: Chenyuan He, Zhouyu Zhang

- Affiliation: Jiangsu University

09:30~09:45: A System for the Deployment of Applications to Remote Robotic Testbeds

- Team Members: Justin Lee, Nicholas Palmer, Drake Essick

- Affiliation: San Diego State University

CPS-IoT 2024 Tock Tutorial

The printed version is provided for your reference only. To access the most up-to-date program, please scan the QR code or visit the official website.

- **The venue is Conference Hall 04, 2/F, 10W if not indicated specifically.**

13:30-14:30 Introduction to Tock

14:30-15:30 Tock Thread Network Application

15:00-15:30 Coffee Break

15:30-16:30 Tock Thread Network Cont.

16:30-17:00 Tock Multi-tenancy and Robustness

17:00-17:30 Next Steps and Future Directions with Tock

Tutotial:
Enhancing CPS Data Reproducibility

The printed version is provided for your reference only. To access the most up-to-date program, please scan the QR code or visit the official website.

- **The venue is Conference Hall 07, 2/F, 10W if not indicated specifically.**

Morning Session:

Data Publication

0900 - 0930

Introductions, Types of Data Archiving in the CPS-VO

0930 - 1000

Demonstration of posting archived static data set and reproducibility instructions

0945 - 1015

Coffee Break

1030 - 1100

Local archiving of static data sets by tutorial participants

1100 - 1200

Posting static data sets to the CPS-VO by tutorial participants

1145 - 1330 Lunch

Afternoon Session:

Automating Public Data Reproducibility

13:30-14:30 Introduction to Tock

14:30-15:30 Tock Thread Network Application

15:00-15:30 Coffee Break

15:30-16:30 Tock Thread Network Cont.

16:30-17:00 Tock Multi-tenancy and Robustness

17:00-17:30 Next Steps and Future Directions with Tock

Travel tips:

Hong Kong has a very convenient railway transportation system. Simply get an Octopus top-up card at any railway station (or Apple Wallet) or use your Visa contactless payment card to pay for the fare.

- **Victoria Peak & Madame Tussauds Hong Kong**

  Scan the QR code for more informaon:

- **Madame Tussauds Hong Kong**

  (This attraction is right at the Victoria Peak.)

Intro: This is the most famous and breathtaking night scene in Hong Kong, and it is a must-visit place for anyone who comes to Hong Kong.

📍 港島綫 荃灣綫 : Island Line (MTR)、Tsuen Wan Line (MTR) Central Station (J2)

Transportaon:

Public:

⌚ **1.2 Hours**

27B › 東鐵綫 › 港島綫 荃灣綫

Route:27B——MTR University Station Bus Terminus—東鐵綫 Tiu Keng Lean

➡Admiralty Station——港島綫 荃灣綫

●Hong Kong Avenue of Stars

Intro: The Hong Kong Avenue of Stars is a public waterfront garden, about 1 km long, with the handprints of many Hong Kong superstars, such as Jackie Chan, Tony Leung, Maggie Cheung, etc At night, you can also enjoy the night view of Victoria

荃灣線 **Tsuen Wan Line (MTR） Tsim Sha Tsui Station（J2）**

Ngong Ping 360

Intro: In addition to the drunken forest city scenery in Hong Kong, there are many places with beautiful natural scenery, such as Ngong Ping 360, which is most famous for its fully transparent crystal cable car and beautiful sunsets. Ngong Ping 360 in Hong Kong is acclaimed as one of the top ten best cable car experiences in the world.

東涌綫 Tung Chung LineChung Station (A)

1.5 Hour

●The Big Buddha of Heaven

Intro: The Big Buddha is a statue of Shakyamuni Buddha located on Muk Yue Peak in front of Po Lin Monastery on Lantau Island, Hong Kong, at an altitude of 520 meters above sea level in Ngong Ping. The Buddha statue sits on 268 stone steps, composed of 202 pieces of copper (160 pieces of Buddha body, 36 pieces of lotus flowers, 6 pieces of cloud heads), 26.4 meters high, with a total height of about 34 meters and a base of about 34 meters, weighing 250 metric tons, sitting on a three-story altar, costing more than 60 million Hong Kong dollars, is the world's second largest outdoor bronze Buddha.

📍 東涌綫 **Tung Chung LineChung Station (A)**

⏱ **1.5 Hours**

Transportaon：
Public：

27B › 東鐵綫 › 屯馬綫 › 東涌綫 ›

27B——MTR University Station Bus Terminus—東鐵綫 Tiu Keng Lean ➡ Hung Hom 屯馬綫 Nanchang Station 東涌綫 › ➡ Tung Chung Station （B）

➡ cable car（Double-ride ticket：270 HKD）

●Hong Kong Palace Museum

Intro： Many of the artifacts from the Forbidden City in Beijing are on public display for the first time, and some of the collections have never been exhibited to the public

東涌綫

1 Hour

Transportaon：
Public： 27B › 東鐵綫 › 屯馬綫 › 東涌綫 ›

27B——MTR University Station Bus Terminus— 東鐵綫 Tiu Keng Lean➡Hung Hom Station 屯馬綫

➡Nanchang Station——東涌綫 › ➡

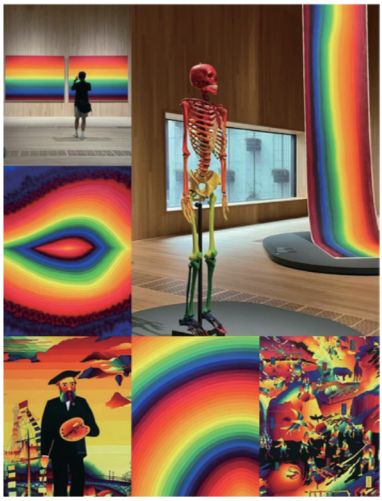
Kowloon Station (B)—— walk for 14 minutes (Google Maps: Hong Kong Palace Museum)

●West Kowloon Cultural District

The West Kowloon Cultural District is a comprehensive area integrating culture, arts, entertainment and commerce

東涌綫 **Tung Chung Line： Kowloon Station（B）**

●M+： Museum



The M+ Museum is located in the West Kowloon Arts District

東涌綫 **Tung Chung Line： Kowloon Station（B）**

Acknowledgment

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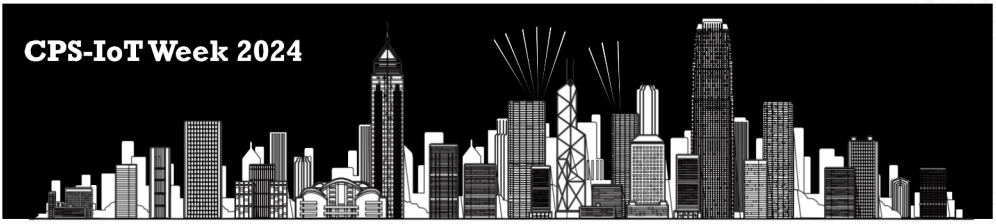

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