WORKSHOP ON SMART SCAN 2023:

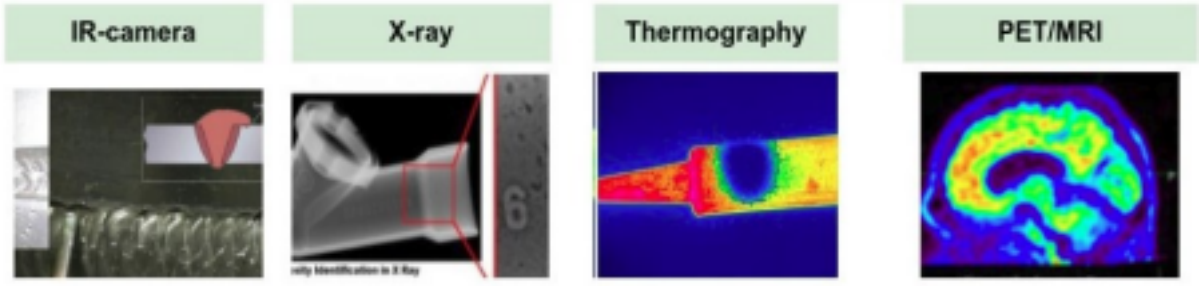
EMERGING TECHNOLOGIES AND TRENDS

Date: 31-Aug-2023, 9am – 4pm

Location: Room-UA3220, Ontario Tech University, 2000 Simcoe Street North, Oshawa, ON L1G 0C5 (map below) Hybrid Event (Zoom link is below)

Contact: Dr. Hossam Gaber, Professor, Ontario Tech University, Email: hossam.gaber@ontariotechu.ca

Ontario Tech University will host the 1st workshop **SS'23** featuring topics relevant to the future vision-based systems community on the latest research, engineering, standards, and business issues. This workshop will present and discuss state-of-the art research in both academia and industry on advanced technologies such as artificial intelligence (AI), the Internet of Things (IoT), and data analytics, to enhance anomaly detection in various industries. The workshop will have two main sessions on smart vision-based systems applied in **non-destructive testing** (NDT) and **medical diagnosis** systems using scanning technologies such as X-ray, CT, MRI, PET, ultrasound, infrared, and light cameras.



Workshop topics:

Industrial Technology	● Recent advancements in NDT inspection technology, potential applications ● New problem definition and challenges: efficiency, cost, green technology ● Novel guidelines for inspection practices and production system regulations ● Open-source datasets and platforms for smart

	inspection research
Academic Research	• Robust machine learning for anomaly detection, and characterization, • Unsupervised, and supervised anomaly detection using limited data • Continual learning and real-time deployment of the deep learning models • Defect simulation for data generation techniques for small/tiny damages • Data management system: data collection, cleaning, labelling, quality

Agenda

9:00	Hossam A.Gabbar, Ontario Tech University, Canada	Opening Remarks
9:15	Simon Zabler, TH Deggendorf, and Fraunhofer Research Institute, Germany	High Throughput Industrial Tomography https://hossamgaber.com/wp-content/uploads/2023/09/ICT_Zabler.pdf
10:00	Hossam A.Gabbar	CT-Based Integrity Control for Nuclear Power Plant Applications
	Abderrazak Chahid	Hybrid Defect Detection and Incremental Learning based Algorithms for X-ray CT Data Inspection
	Jason Manarroo	Interactive User Interface Demo for CT-Based Inspection Solution
10:30	Break	
10:45	Yassine Hariri, CMC Microsystems	Advancements and Opportunities in Edge AI: Insights from CMC Microsystems https://hossamgaber.com/wp-content/uploads/2023/09/CMCsmartscan2023.pdf
11:30	Hossam A.Gabbar, Abderrazak Chahid, Jason Manarroo	Tooth.AI with Incremental Learning from X-Ray Images for Effective Dental Diagnosis
11:45	John Gaber, Jing Ren, Hossam A.Gabbar, Ontario Tech University, Canada	EEG-Based Brain Scanning and Analysis for Effective and Safe Operation in Nuclear Power Plants
12:00	Muhammad Idrees, Hossam A.Gabbar	Automated Surface Scanning for Industrial Applications

12:15	Hossam A.Gabbar, Roman Stetsiuk, Abderrazak Chahid, Awais Zafar, Manir Isham	Drone-based Inspection for Industrial and Commercial Facilities
12:30	Closing	

Speaker: Hossam A.Gabbar

Dr. Gabbar is a full Professor in the Faculty of Engineering and Applied Science, at Ontario Tech University (UOIT). He is the recipient of the Senior Research Excellence Aware for 2016, UOIT. He is recognized among the top 2% of worldwide scientists with high citation in the area of smart energy. He is a Distinguished Lecturer of IEEE NPSS. He is leading national and international research in the areas of smart energy grids, applied AI and machine learning. Dr. Gabbar obtained his B.Sc. degree in 1988 with first class of honor from the Faculty of Engineering, Alexandria University (Egypt). In 2001, he obtained his Ph.D. degree from Okayama University (Japan). From 2001 till 2004, he joined Tokyo Institute of Technology (Japan), as a research associate. From 2004 till 2008, he joined Okayama University (Japan) as an Associate Professor, in the Division of Industrial Innovation Sciences. From 2007 till 2008, he was a Visiting Professor at the University of Toronto. Dr. Gabbar has more than 230 publications, including patents, books / chapters, journal, and conference papers. Some of his recent funded projects on Intelligent, Interconnected Infrastructures, Automated and Autonomous Inspection Systems; Intelligent Experience Retention System (IERS); Demonstration of Smart Water Systems for Sustainable Cities; Intelligent Query and Learning System (IQLS); and Automated CT Data Analysis for Nuclear Reactor Maintenance.

Speaker: Yassine Hariri, PhD

Senior Staff Scientist – AI/ML and Embedded Systems
CMC Microsystems, Ottawa, ON, Canada
www.CMC.ca

Advancements and Opportunities in Edge AI: Insights from CMC Microsystems

Abstract

The deployment of AI at the edge offers notable advantages in terms of latency, bandwidth efficiency, data privacy, and reliability. This presentation explores the rapid progress in AI and the challenges related to migrating compute-intensive AI workloads to the edge. It examines the potential for innovation in conventional computing, such as specialized neural processors and intricate memory hierarchies. Additionally, it showcases Canada's strong AI software ecosystem and the importance of addressing the gap in advanced AI hardware, especially at the edge. The presentation concludes by emphasizing the significant network of partnerships between CMC Microsystems and Canadian companies and start-ups through the Virtual Incubator Environment (VIE). This collaboration enables industry professionals to leverage cutting-edge AI/ML infrastructure and ecosystem, empowering them to tackle complex problems effectively.

Biography

Over 15 years of experience in advanced computing systems from the cloud to the very edge, with a focus on artificial intelligence, computer vision, video, image and sensor fusion workloads acceleration, FPGA based prototyping, software stack, and domain-specific hardware

architectures. Currently leading projects related to the specification, development, implementation, deployment, and support of the next generation of advanced computing infrastructure mainly FPGAs, GPUs, and Custom Hardware for AI applications. Dr. Hariri earned his B.A.Sc. in Computer Engineering from Ecole Marocaine des Sciences de l'ingénieur, Casablanca, Morocco, in 1998, and the M.S. and Ph.D.

degrees from Ecole de Technologie Supérieure (ETS), Montreal, QC, Canada, in 2002 and 2008, respectively, all in electrical engineering.

Attendees List:

Hossam Gaber, Ontario Tech
Yassine Hariri, CMC
Tushar Patel, SNC Lavalin
Fahimeh Rajabiyazdi, SNC Lavalin
Hai Chen, SNC Lavalin
Josh Weisbrod, SNC Lavalin
Talha Ahmad, SNC Lavalin
Muhammad Ahmad, Ontario Tech
Jason Manarroo, Ontario Tech
Elena Villalobos Herra, Ontario Tech
Muhammad Idrees, Ontario Tech
Roman Steciuk, Ontario Tech/Ukraine
Manir Isham, Ontario Tech
Rushirajsinh Rathod, Ontario Tech
Farhan Maghrabi, Ontario Tech

Virtual Attendees:

Jing Ren, Ontario Tech
Simon Zabler, Fraunhofer, Germany
Abderrazak Chahid, Ontario Tech
Ahmed Mohamed, Ontario Tech
Neal Betts, Ontario Tech
John Gaber, York University

OntarioTech UNIVERSITY

ZOOM Link

Hossam Gaber is inviting you to a scheduled Zoom meeting.

Join Zoom Meeting
https://ontariotechu.zoom.us/j/9953259403?pwd=QStZUWNPY1hUaXQvR1duUENYcUgrQT09

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