MW AND MM WAVE TECHNOLOGIES FOR SMART APPLICATIONS WORKSHOP

IEEE MTT-S Egypt Section Chapter Workshop

Abstract

A workshop by the IEEE MTT-S Egypt Section Chapter will be held on 12&13 May 2025 as a parallel activity to the inaugural conference of IEEE ICEENG2025. The workshop is the second of the MW/RF Technologies for Humanities Workshop Series launched by the IEEE MTT-S Egypt Section Chapter. All professionals, industry members and students interested in this field are encouraged to attend.

Organizers: MTC, IEEE-MTT-S Egypt Chapter & ICEENG

Prof.Ayman.Eltager@ieee.org

MTT-S IEEE MICROWAVE THEORY & TECHNOLOGY SOCIETY EGYPT CHAPTER

IEEE Egypt Section

IEEE SIGHT Special Interest Group on Humanitarian Technology

MW AND MM WAVE TECHNOLOGIES FOR SMART APPLICATIONS WORKSHOP

IEEE ICEENG 2025, 12-13 May 2025, MTC, Cairo, Egypt

(Organizers: MTC, IEEE-MTT-S Egypt Chapter & ICEENG)

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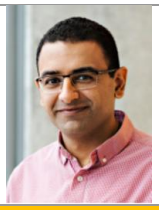
			Monday 12 May (Room 1)
9:00AM-2:30PM			Workshop Registration
2:30-2:35PM	**Chairs: Prof. A. Sebak, Prof. Tamer Abuelfadl**		**WORKSHOP OPENNING/WELCOME MESSAGE (IEEE EGYPT SECTION CHAPTER, MTT17, CH08937)** ***Prof. Ayman M. EL-Tager,*** IEEE Senior Member, Chair and Founder of IEEE-MTT Egypt Section Chapter, Scientific Council Chair of the Electronic Eng. Dept., MTC Cairo, Egypt.
2:35-3:10PM			**LOCAL SOLUTIONS, GLOBAL IMPACT: LEVERAGING THE IEEE HTB / SIGHT'S GLOBAL NETWORK FOR SOCIETAL CHALLENGE** ***Prof. Mohammad Essaaidi*** 2025 IEEE SIGHT Committee Chair, IEEE Global Cities Alliance, MEA Chair, IEEE Humanitarian Technologies Programs Committee Chair, EMSI Director, Rabat, Morocco.
3:10-3:45PM			**GLOBAL BEST PRACTICES IN DEVELOPING RESILIENT AND SUSTAINABLE SMART CITIES** ***Prof. Mohammad Essaaidi,*** EMSI Director, Rabat, Morocco.
3:45-4:30PM			**RADARS, DIGITAL TWINS, AND THE FUTURE: THE UNSEEN HEROES OF TOMORROW'S TECHNOLOGY** ***Prof. George Shaker*** University of Waterloo, Canada
9:00-11:00			**Tuesday 13 May (Abdelaziz Seif Hall)**
9:00-9:45	**Chairs: Prof. E. Abdalla, Prof. A Eltager**		**GREEN COMMUNICATIONS IN EGYPT** ***Senior Engineer: Adel Elsherif,*** Head of Data Center at e&, Cairo, Egypt.
9:45-10:45			**ENGINEERED SURFACES FOR MM WAVE ANTENNAS AND RADAR SCATTERING CONTROL** ***Prof. Abdelrazik Sebak,*** Ph.D., P.Eng., IEEE Fellow, EIC Fellow Dr Abdel Razik Sebak is a Tier I Concordia University Research Chair
10:45-11:00			**Closing Ceremony (Workshop Chair & IEEE MTT-S Egypt Chapter)** Prof. Esmat Abdalla, IEEE Senior Member, Full Research Professor at ERI, Former President of the ERI, Cairo, Egypt
11:00-11:30			**Coffee Break**

Prof. Mohamed Essaaidi is CEO of the Moroccan School of Engineering Science (EMSI) Group, (Since January 2023), Chief of Party of Interactive Digital Center Morocco at UM6P (since November 2020) and a Professor and past Dean of ENSIAS school of Computer Science, Mohammed V University, Rabat, Morocco (2011-2023), Past Director of International Cooperation at the Ministry of General Affairs & Governance, Morocco (2019), and past faculty member of the of Abdelmalek Essaadi University, Tetuan, Morocco (1993-2011).

He is the 2025 IEEE SIGHT Committee Chair, IEEE Global Cities Alliance, MEA Chair, and the IEEE Humanitarian Technologies Programs Committee Chair.

He was the IEEE Global Cities Alliance, Middle East & Africa Chairman (2020-2022), and he has been the IEEE Humanitarian Technologies Board Programs Committee Chair and IEEE Special Interest Group on Humanitarian Technologies Global Chair since January 2023, IEEE EAB Teaching Excellence Editorial Hub, Member (2021-2022), and IEEE Public Safety Technology, Education Chair (2021-22). He is also the founder and past Chairman of the IEEE Morocco Section (2005-2016), co-founder and chair of several IEEE Organizational Units in Morocco during the last two decades.

He has authored and co-authored 10 books and more than 200 papers in international refereed journals and conferences in the field of Electrical and Computer engineering and its diverse applications. In addition, he is the founder and the General Chair / co-chair of several IEEE technically sponsored international conferences such as Information and Communication Technologies International Symposium (2005, 2007), NATO Advance Research Workshop on Information Security Assurance (2005), International Conference of Multimedia Computing and Systems series (2009-2016). He also co-organized and co-chaired IEEE Smart Cities Summit in May 2020, the US National Academies 5th Arab American Science, Engineering and Medicine Frontiers Symposium in November 2017, Rabat, Morocco and US NSF sponsored workshop on Smart Cities in January 2016 in Rabat, Morocco. He has also served in the Organizing committees and TPC and presented keynote talks at many other international conferences worldwide.

Furthermore, Prof. Essaaidi served as an international expert on Digital Transformation and Smart Cities for several international organizations such as UN, ITU, UNESCO, EU, ICESCO and UCLG Africa, and he is a member of the Oversight Committee of US National Academies of Science Engineering & Medicine US -Arab and US-Africa Frontiers of Science Engineering & Medicine Symposia (Since 2020).

Moreover, in the framework of his position as the Director of International Cooperation in the Ministry of General Affairs and Governance (Morocco), he was involved in the coordination of the World Bank Group Morocco Country Partnership Framework (2019-2024) and OECD Morocco Country Program (2019-2024) among other international cooperation programs.

Prof. Essaaidi is the recipient of the 2023 IEEE MGA Larry K. Wilson Transnational Award For “exemplary leadership, significant contributions, and sustained excellence in leading IEEE Technical Activities and Humanitarian programs globally”.

Title:

Local Solutions, Global Impact: Leveraging The IEEE HTB / SIGHT's Global Network for Societal Challenge

Abstract:

This talk will explore the transformative potential of the IEEE Humanitarian Technology Board (HTB) and Special Interest Group on Humanitarian Technology (SIGHT)'s global network in addressing pressing societal challenges, demonstrating how local solutions can achieve significant global impact. By showcasing successful initiatives supported by this expansive network, the presentation will highlight opportunities for individuals to contribute their skills and expertise to impactful humanitarian projects worldwide. Learn how the HTB/SIGHT facilitates collaboration, provides resources, and amplifies the reach of grassroots efforts in areas ranging from disaster relief to sustainable development. Discover how you can become a member and join a vibrant global community of volunteers and experts using technology for good.

Prof. Mohamed Essaaidi is CEO of the Moroccan School of Engineering Science (EMSI) Group, (Since January 2023), Chief of Party of Interactive Digital Center Morocco at UM6P (since November 2020) and a Professor and past Dean of ENSIAS school of Computer Science, Mohammed V University, Rabat, Morocco (2011-2023), Past Director of International Cooperation at the Ministry of General Affairs & Governance, Morocco (2019), and past faculty member of the of Abdelmalek Essaadi University, Tetuan, Morocco (1993-2011).
He is the 2025 IEEE SIGHT Committee Chair, IEEE Global Cities Alliance, MEA Chair, and the IEEE Humanitarian Technologies Programs Committee Chair.

Title:

Global Best Practices in Developing Resilient and Sustainable Smart Cities

Abstract:

The global movement towards resilient and sustainable smart cities is generating a wealth of knowledge and the emergence of de facto best practices. This presentation will explore international best practices and standards including successful approaches that are shaping the future of urban development. This talk will analyze how leading cities are benchmarking their progress against established sustainability targets and resilience metrics. Through a comparative study of diverse case studies, it will extract valuable lessons learned and highlight replicable best practices in areas like smart energy management, circular economy initiatives, climate adaptation strategies, and citizen engagement. It will also emphasize the role of standardization in facilitating knowledge sharing, promoting interoperability, and accelerating the adoption of effective solutions for building smart cities and communities that are both environmentally sound and robust in the face of evolving risks.

Dr. George Shaker is an internationally recognized expert in wireless sensing technologies, specializing in radar-based systems for healthcare, automotive, and industrial applications. With a PhD from the University of Waterloo, and a research visit to Georgia Tech (United States), along with over 200publications and 35+ patents, George has led groundbreaking projects with leading global multinationals and fortune 500 companies. He has spearheaded innovative technologies ranging from in-cabin automotive radars to non-invasive healthcare monitoring systems using AI-powered radar sensors.

As the Director of the Wireless Sensors and Devices Laboratory at the University of Waterloo, George led multi-disciplinary teams in the development of next-generation sensors and IoT solutions. His work has earned numerous awards, including multiple IEEE Best Paper Awards, placing him at the forefront of advancements in radar, IoT antenna architectures, and wireless sensor technologies.

George's visionary leadership extends beyond academia into industry, where he has led/supported the launch of products in consumer wearables and electronics, health monitoring, agricultural quality control, and AI-enabled robotics. His contributions have helped revolutionize several sectors including autonomous vehicles, robotic connectivity, remote health monitoring, and smart cities.

Dr. Shaker is an IEEE Sensors Council Distinguished Lecturer, an IEEE AP-S Distinguished Industry Speaker, the Chair of the IEEE AP-S Technical Committee on Environment and Societal Impacts, the Vice-Chair of the IEEE AP-S Membership & Benefits Committee, and the Vice-Chair of the IEEE MTT-S Technical Committee on Autonomous Systems.

Title:

Radars, Digital Twins, and the Future: The Unseen Heroes of Tomorrow's Technology

Abstract:

In this talk, we delve into the cutting-edge integration of radar sensors and digital twins, a convergence driving transformative advancements across various industries. Radar technology, with its unparalleled capabilities in real-time monitoring and decision-making, is rapidly becoming a cornerstone of the wireless IoT ecosystem. We will explore how these technologies are revolutionizing consumer electronics and autonomous systems, and leading to groundbreaking healthcare applications—from non-invasive glucose sensing to the seamless integration of radar sensors into everyday environments.

Through an intro to radar systems, integrated antenna designs, the fusion of radar with AI, and the creation of digital twins, this talk will attempt to offer a glimpse into the current trends and future potential of these technologies.

Eng. Adel Elsherif is the Head of Data Center at e&, where he leads critical initiatives in the design, development, and management of advanced data center infrastructures. A certified ATD (Accredited Tier Designer) professional, Adel brings extensive expertise in designing high-performance, resilient data centers.
Throughout his career, he has made significant contributions to the successful design and construction of numerous data centers, both within e& and during his tenure at the Ministry of Communications and Information Technology.
In addition to his design expertise, Adel has a strong background in implementing energy-saving techniques and sustainable practices, optimizing operational efficiency and reducing environmental impact. His technical proficiency, strategic vision, and commitment to excellence continue to drive innovation and operational excellence in the evolving world of data center technologies.

Title:

GREEN COMMUNICATIONS IN EGYPT

Abstract:

Green communications have been proposed as an emerging strategy to reduce the Carbon foot print produced by Mobile networks.

This reduction can be achieved either by supplying the network from green energy Source and/or applying various software features allowing to minimize the energy consumption during low utilization times, were we will highlight on the main techniques used at the radio layer, However at the core layer this can be achieved through virtualization/Telco Cloud which provides efficient use for the hardware resources, some other software features used with new hardware that allows minimizing energy consumptions slightly.

Dr Abdel Razik Sebak is a Tier I Concordia University Research Chair. Before joining Concordia University, he was a professor at the University of Manitoba. He was also with Cairo University and worked with the Canadian Marconi Company on the design of microstrip phased array antennas.

Dr Sebak's recent research activities cover two streams: Antenna Engineering, and Analytical and Computational Electromagnetics. Applied and sponsored projects include high gain mm-wave antennas, advanced composite materials for aerospace shielding and antenna applications, microwave sensing and imaging, ultra-wideband antennas, and microwave beamforming. Dr. Sebak's original research contributions and technical leadership have been extensive and resulted in over 600 publications in prestigious refereed journals (250) and international conference proceedings (h-index 52). He is among the world top 2% scientists Scopus Citation according to Science-wide author databases of standardized citation indicators.

Dr Sebak was inducted as a Fellow of the Institute of Electrical and Electronics Engineers in 2009. He is also a Fellow of the Engineering Institute of Canada. Dr. Sebak is a member of Concordia University Provost's Circle of Distinction for his career achievements. For his joint efforts in establishing one of the most advanced electromagnetic computational and antennas labs at the University of Manitoba, Dr. Sebak received the Rh Award for Outstanding Contributions to Scholarship and Research. Dr. Sebak received the 1992 and 2000 University of Manitoba Merit Award for outstanding Teaching and Research. In 1996 Dr. Sebak received the Faculty of Engineering Superior Academic Performance. Dr Sebak has also received the IEEE Antennas and Propagation Society Best Chapter Award.

Dr. Sebak is the General Chair of the IEEE ITC-EGYPT2025, the IEEE-ANTEM2016 Symposium and Co-Chair of the IEEE ICUWB2015. He has served as Chair for the IEEE APS Ad-Hoc Award Committee (2022-2024). Dr. Sebak has also served as Chair for the IEEE Canada Awards and Recognition Committee (2002-2004), IEEE Canada Conference Committee (2000-2002) and as the Technical Program Chair for the 2002 IEEE CCECE Conference and the 2006 URSI-ANTEM Symposium. He has also served as a member (2002-2004) of the IEEE RAB Awards and Recognition Committee. Dr. Sebak has served as Associate Editor, Journal of Applied Computational Electromagnetic Society, Associate Editor, International Journal of Antennas and Propagation. Associate Editor, J. Engineering Research. He is a member of the Canadian National Committee of International Union of Radio Science (URSI) Commission B.

Title:

Engineered Surfaces for mm Wave Antennas and Radar Scattering Control

Abstract:

In this talk we present efficient design of engineered surfaces for enhancement of antenna performance and Radar Cross Section (RCS) control. Our objective is to design engineered surface within a broad bandwidth and wide oblique incidence stability in addition to the lowest possible RCS reduction in all directions. Frequency selective surface (FSS) technology is employed to enhance the performance of radiation and scattering properties of antennas used in different sectors such as aerospace, medical, and microwave industry. Therefore, it is appropriate and attractive to propose the use of FSS technology to design practical and efficient antennas. In addition, we utilize efficient guiding structure such as Printed Ridge Gap Waveguide (PRGW) as an essential implementation technique for mmWave systems.