

AP-S Distinguished Lecturer Seminar

Flexible, Wearable, and Disposable Wireless Communication and Sensing Systems Through Additive Manufacturing

Prof. Atif SHAMIM, KAUST, Saudi Arabia



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Time: 15:00

Location: onsite in Room 1L,
Dipartimento di Ingegneria Civile,
Ambientale e Meccanica, Via
Mesiano 77, Trento; and online at



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With the advent of wearable sensors and the Internet of Things (IoT), there is a growing focus on electronics that can be bent, stretched, and conformally integrated onto the human body or mounted on non-planar objects. Given the massive scale of deployment—often reaching billions of devices—there is a critical need for extremely low-cost solutions, to the extent that such devices can become disposable. The flexible and low-cost requirements can be effectively addressed through additive manufacturing technologies such as inkjet and screen printing. This talk introduces additive manufacturing as an emerging technique to realize low-cost, flexible, and wearable wireless communication and sensing systems. The ability to print electronics on unconventional substrates such as plastics, paper, and textiles has opened up a wide range of new applications. Various innovative antenna and sensor designs realized through additive manufacturing will be presented. A multilayer printing process will be discussed, where dielectrics are printed in addition to metallic layers, demonstrating fully printed components. Several new functional inks and their use in tunable and reconfigurable components will also be shown, followed by system-level examples of wireless sensing applications.

Beyond fundamental research, this talk will highlight how innovations in printed electronics can transition into real-world products, illustrated through the example of a successful company that emerged from academic research to deliver scalable industrial sensing solutions—demonstrating a clear pathway from laboratory concepts to commercial impact. The promising results of these designs indicate that the day when electronics can be printed like newspapers and magazines through roll-to-roll manufacturing is not far away.

Atif Shamim received his MS and PhD degrees in electrical engineering from Carleton University, Canada in 2004 and 2009 respectively. He was an NSERC Alexander Graham Bell Graduate scholar at Carleton University from 2007 till 2009 and an NSERC postdoctoral Fellow in 2009-2010 at Royal Military College Canada and KAUST. In August 2010, he joined the Electrical and Computer Engineering Program at KAUST, where he is currently a Full Professor and Principal Investigator of IMPACT Lab. He was an invited researcher at the VTT Micro-Modules Research Center (Oulu, Finland) in 2006. His research work has won best paper awards in IEEE IMAS 2025, IEEE ICMAC 2025 and 2021, IEEE IMS 2016, IEEE MECAP 2016, IEEE EuWIT 2008, first prize in IEEE IMS 2019 3MT competition, IEEE AP-S Design Competition 2022 and IEEE MTT-S Design Competition 2024, finalist/honorable mention prizes in IEEE APS 2023, IEEE AP-S Design Competition 2020, IEEE IMS 2017 (3MT competition), IEEE IMS 2014, IEEE APS 2005 and R. W. P. King prize for journal papers in IEEE TAP 2017 and 2020. He has served as the Distinguished Lecturer for IEEE AP-S (2022-2024). He has won the Kings Prize for the best innovation of the year (2018) for his work on sensors for the oil industry. He was given the Ottawa Centre of Research Innovation (OCRI) Researcher of the Year Award in 2008 in Canada. His work on Wireless Dosimeter won the ITAC SMC Award at Canadian Microelectronics Corporation TEXPO in 2007. Prof. Shamim also won numerous business-related awards, including 1st prize in Canada's national business plan competition and was awarded OCRI Entrepreneur of the year award in 2010. He is an author/co-author of 1 book, 3 book chapters and 400 international publications, an inventor on 40 patents and has given over 130 invited talks at various international forums. His research interests are in innovative antenna designs and their integration strategies with circuits and sensors for flexible and wearable wireless sensing systems through a combination of CMOS and additive manufacturing technologies. He is a Fellow of IEEE, founded the first IEEE AP/MTT chapter in Saudi Arabia (2013) and is currently serving as the Editor-in-Chief of IEEE Journal of Electromagnetics, RF and Microwaves in Medicine and Biology (J-ERM). He has previously served on the editorial board of IEEE Transactions on Antennas and Propagation (2013-2019), IEEE J-ERM (2020-2024), and as a Guest Editor for IEEE AWPL Special Issue (2019). He served as IEEE AP-S AdCom member in 2025, and is currently serving as the Founding Chair of IEEE AP-S TC-8 (wireless Communication), Vice Chair of IEEE APS MGA Committee, member of IEEE APS Fellows committees and leads the student travel grants committee. He has previously served on IEEE TC on Antenna Measurements (AP-S), Microwave Controls (MTT-S 13), and Additive Manufacturing (CRFID). Find out more details at <https://impacts.kaust.edu.sa/>