

2024 IEEE Smart World Congress

Panel 1: Riding the Wave: Towards Smarter Digital Twins

In the increasingly connected world with the growing capabilities of sensing, mobility, networking and computational power, the seamless integration and collaboration of people, machines, and organizations in both physical and digital realms have become a prominent and pressing topic. At the heart of this dynamic transformation and transition, digital twin plays a crucial role in representing and manipulating physical entities in virtual world. These technologies continue to rapidly evolve as industries increasingly recognize their potential. Digital twin serves as a bridge, linking the physical and digital worlds, offering a potent toolset for comprehending, managing, and enhancing intricate systems and processes, involving people, machinery, and organizations. Meanwhile, the Intelligent Internet of Things (IIoT) stands as a transformative force across a multitude of industries and applications. It injects intelligence into interconnected everyday objects and systems, revolutionizing operations with increased efficiency, automation, and innovation. This revolution has led to notable improvements in resource management, cost-effectiveness, and elevated user experiences. The fusion of digital twin and IIoT technologies generates robust solutions that enable real-time monitoring, analysis, and control of physical assets and systems. This fusion holds particular significance in dynamic and complex environments like manufacturing, healthcare, transportation, agriculture, and the development of smart cities.

This panel discussion serves as a dynamic platform for the exchange of ideas, knowledge dissemination, critical analysis, and collaboration within the academic community. It plays a pivotal role in advancing scholarship, nurturing intellectual growth, and addressing critical societal challenges. It is expected that the interactions and debates will ignite intellectual stimulation, inspire innovation and encourage interdisciplinary thinking, ultimately advancing the research frontier.



Chair:

Professor Liming Chen

Dalian University of Technology, China

Liming Chen is Chair Professor in the School of Computer Science and Technology at Dalian University of Technology, China. He is a Fellow of IET, has served as the chief scientist of European Horizon 2020 Excellence Research MSCA project and the Research Director for the School of Computing, Ulster University, UK. His current research interests include data analytics, artificial intelligence, pervasive computing, user-centred smart cyber-physical systems and their applications in smart healthcare and IoT cybersecurity. Dr Chen has over 300

publications in internationally recognised journals, book series and conferences. He was the General Chair for IEEE Digital Twin 2024/2023, IEEE WoWMoM2022, IEEE Smart World Congress 2019, IEEE UIC2017, IEEE HealthCom2017, and an associate or guest editor for IEEE THMS and Computer, Elsevier PMC and IJDSN and Springer PUC and AIHC. His research has been funded by external grants from the UK research councils, European Research Programmes such as FP7, AAL and Horizon 2020, and industrial collaborators like SAP, British Telecommunication and PwC. Dr Chen has delivered over 40 keynotes, invited talks and seminars in various forums, conferences, industry and academic events. He has served as an expert for research funding assessment for UKRI, EU Horizon2020, Canada, Chile, Netherlands and Denmark.

Panelists:



Professor Bin Hu

Beijing Institute of Technology, China

Title: Emotion Understanding Technologies in Digital Twins.

Bin Hu is a (Full) Professor and the Dean of the School of Medical Technology at Beijing Institute of Technology, China. He is a National Distinguished Expert, Chief Scientist of 973 as well as National Advanced Worker in 2020. He is a Fellow of IEEE/IET/AAIA and IET Fellow Assessor & Fellowship Advisor. He serves as the Editor-in-Chief for the IEEE Transactions on Computational Social Systems and an Associate Editor for IEEE Transactions on Affective Computing. He is one of Clarivate Highly Cited Researchers and World's Top 2% Scientists. He is a Member of the Steering Council of the ACM China Council and the Vice-Chair of the China Committee of the International Society for Social Neuroscience. He is also the TC Co-Chair of computational psychophysiology in the IEEE Systems, Man, and Cybernetics Society (SMC). He is a Member of the Steering Committee of Computer Science at the Chinese Ministry of Education, Science and Technology Commission at the Chinese Ministry of Education.



Dr Everton Cavalcante

Federal University of Rio Grande do Norte, Brazil

Title: How Far Are We: From the Current Wave to Autonomic and Cooperative Digital Twins

Everton Cavalcante is an Assistant Professor in Computer Science and Software Engineering at Federal University of Rio Grande do Norte, Natal, Northeastern Brazil. He received PhD diplomas in Computer Science from Federal University of Rio Grande do Norte, Brazil, and in

Information and Communication Technologies and Sciences from Université Bretagne Sud, France. He was also a visiting researcher at Durham University, United Kingdom (2023-2024) and Télécom SudParis, France (2018). His current research interests are focused on digital twins, systems-of-systems, Internet of Things, middleware, software architectures, and smart city applications.



Professor Zheng Yan

Xidian University, China

Title: Digital Twin Positioning

Zheng Yan is Distinguished Professor at Xidian University, an IEEE Fellow, IET Fellow, AAIA Fellow, and AIIA Fellow. She is a Stanford World top 2% scientist, and a highly cited researcher by Elsevier in China. Her research interests are in trust management, information and network security, privacy protection, and data analysis. She has published more than 400 papers in prestigious journals and conferences worldwide, including IEEE SP, IEEE TIFS, IEEE TDSC, INFOCOM, and ICSE, with over 270 as first or corresponding author. She has authored two English books, used for teaching for nearly a decade. She holds 110+ international and domestic patents, including 50 PCT patents, with more than 150 patents adopted by industry, most of them are solely invented by her. Some of these patents have entered international standards or are widely used. Her U.S. patents are tracked by over 60 Fortune Global 500 companies. She has received numerous awards, including the Nokia Distinguished Inventor Award, three EU awards, N²Women Star in Computer Networking and Communications, IEEE TCSC Award for Excellence in Scalable Computing, IEEE TEMS Distinguished Leadership Award, 18 times of IEEE Outstanding Leadership and Service Awards, AALTO ELEC Impact Award, IEEE ComSoc Big Data Technical Committee Best Journal Paper, IEEE TrustCom Outstanding Paper, Shaanxi Natural Science Award, and Outstanding Doctoral Dissertation Supervisor by the Electronic Association of China. She founded the first IEEE Blockchain International Conference and serves as a Steering Committee Co-chair. She serves as an Executive Editor-in-Chief of Information Sciences and Area Editor/Associate Editor/Editor Board Member for over 60 journals, including ACM Computing Surveys, Information Fusion, IEEE IoT Journal, IEEE Network Magazine, etc. She has served as a General Chair or Program Committee Chair for over 40 international conferences and has delivered over 30 keynotes and invited talks at international conferences and renowned enterprises.