NOVEMBER 14, 2022
1:00 PM – 2:00 PM EST

SPEAKER:

DR. BERK CANBERK

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Environment, Edinburgh Napier
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HOST: Dr. Burak Kantarci
Smart Connected Vehicles Innovation Centre, Univ. of Ottawa

LOCATION:
In-Person for Ottawa/Kanata-based researchers: SCVIC, 535 Legget Drive, Kanata, ON
Virtual: *Link will be provided for attendees that are not in Kanata/Ottawa*

REGISTRATION: Please register by 11 November 5pm EST. Click to register.

Smart Connected Vehicles
Innovation Centre

Digital Twin Networks in 6G Era: The Real-Time Connected Intelligence

Abstract

With the tremendous advances in the upcoming 6G era, the world enters an age of connected intelligence. This will enable real-time Digital Twin deployments with specific integrated features such as seamless automation and control, augmented reality/virtual reality, visualization, and more connected devices per square kilometer. This new knowledge-based era of the 6G vision needs seamless control systems, fully automated management, artificial-intelligence enabled communication, well-bred computing methodologies, self-organizing behaviors, and high-end connectivity. Here, the importance of Digital Twins Network (DTN) based systems has become vital. Digital Twin Network (DTN) is the virtual representation of a Cyber-Physical System's network elements and dynamics. The use of DTN provides undue advantages such as resiliency, sustainability, real-time monitoring, control-tower-based management, thorough what-if analyses, an extremely high-performance simulation model for research, testing, and optimization. With these in mind, in this talk, first, a short recap of the ai-enabled digital twin concept and its potential market size in Industry 4.0 will be introduced. The technology behind DTN, such as the high precision virtual network modeling and edge intelligence for ultra-low latency, will then be described. The reliability, latency, capacity, and connectivity issues in DTN will be discussed. Moreover, several application areas of DTN will also be underlined in terms of demand forecasting, warehouse automation, predictive maintenance, anomaly detection, risk assessment, intelligent scheduling, and control tower. Some important implementation areas of DTN such as Supply Chain Management, Smart Manufacturing, Sustainable Product Line Management, Healthcare, and Smart Cities will also be covered.

Dr. Berk Canberk is a Professor in the School of Computing, Engineering and The Built Environment at Edinburgh Napier University (UK), and also a Professor in the Dept. of Artificial Intelligence and Data Engineering at Istanbul Tech. University (ITU). He received his PhD in Computer Science in ITU in 2011, his MSc in Telecommunications Engineering from the Chalmers University of Technology Sweden in 2005, and his BSc in Electrical Engineering from ITU in 2003. He was a Post-Doctoral researcher at Georgia Institute of Technology (U.S) between 2011-13. He's been an Adjunct Professor in the Department of Electrical and Computer Engineering at Northeastern University USA since 2017. His research areas are AI-enabled Digital Twins, IoT Communication, and Smart Wireless Networks. In his research group named Broadband Communication and Network Automation Research Group (BCRG) in ITU, he leads the research activities in these highly interdisciplinary fields, supervising 8 PhD and 4 MSc students. So far, he has supervised 16 MSc students; and 4 PhD students who are now all tenure-track professors. He has published 54 journal papers (37 in Q1 quartile, 6 in Q2 quartile, and 11 are Q3+Q4 quartiles), 53 conference papers, 2 books, 4 book chapters, and 2 approved US patents. He is an IEEE Senior Member, and he acts as an Associate Editor for IEEE Transactions on Vehicular Technology (Q1), Elsevier Computer Networks Journal (Q1), and Elsevier Communication Networks Journal (Q1). He's actively involved in several prestigious conferences as TPC chair and member, including IEEE INFOCOM, IEEE ICC, and IEEE GLOBECOM, and in organizing committees of many other conferences.

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