

# Title: Deep and Reinforcement Learning in 5G and 6G

**Abstract:** The next generation of wireless networks, also known as Beyond 5G and 6G, will need a very high level of automation. This is both because of the increased complexity and thanks to the availability of more data, advanced Machine Learning (ML) algorithms, and robust processing capabilities. When it comes to the automation of networks, intelligent control algorithms that allow turning the knobs and optimizing system parameters become essential. Reinforcement learning and deep reinforcement learning algorithms have shown great success in other areas in AI and ML. In this talk, we will provide an overview of the state-of-art reinforcement and deep reinforcement learning algorithms and their applications to wireless networks, as well as new architectures such as O-RAN, in addition to their challenges and the open issues in terms of their applicability to various functions of future wireless networks.

**Bio:** Melike Erol-Kantarci is Chief Cloud RAN AI\ML Data Scientist at Ericsson and Canada Research Chair in AI-enabled Next-Generation Wireless Networks and Associate Professor at the School of Electrical Engineering and Computer Science at the University of Ottawa. She is the founding director of the Networked Systems and Communications Research (NETCORE) laboratory. She is also a Faculty Affiliate at the Vector Institute, Toronto. She has over 150 peer-reviewed publications, which have been cited over 6000 times, and she has an h-index of 40. She has received numerous awards and recognitions. Recently, she received the 2020 Distinguished Service Award of the IEEE ComSoc Technical Committee on Green Communications and Computing, and she was named N2Women Stars in Computer Networking and Communications in 2019. Dr. Erol-Kantarci has delivered 70+ keynotes, tutorials, and panels around the globe and has acted as the general chair and technical program chair for many international conferences and workshops. Her main research interests are AI-enabled wireless networks, 5G and 6G wireless communications, smart grid, and IoT. She is an IEEE ComSoc Distinguished Lecturer, IEEE Senior Member, and ACM Senior Member.