



Deep Learning in Radiocommunication Systems and Networks

Krzysztof K. Cwalina

Faculty of Electronics, Telecommunications and Informatics,
Gdańsk University of Technology, Gdańsk, Poland

1 Abstract

The use and utilization of the Artificial Intelligence, especially the Deep Learning approach in wireless communication is one of the current worldwide research trends. It can provide many solutions both on future research challenges as well as on already known problems in almost all radiocommunication systems, networks and signal processing areas, e.g. for optimizing resource allocation for users; in power, spectrum and beam control management; in radiolocation - determining position, detecting propagation conditions; for classification and prediction of user behavior or location etc.

The aim of this tutorial is to present the deep learning approach in the mentioned applications of radiocommunication systems and networks in practical applications. The scope of the tutorial include explanation of concepts, architectures and methodologies for designing deep networks, brief description of current state of the art, presentation of the results of ongoing research and practical applications, identification attempt of future works that can be conducted in the field of signal processing for the needs of radiocommunication systems and networks.