

IEEE Distinguished Lecture

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Title: AI is more than Machine Learning - Alternative Computational Methods for Future Networks

June 17, 2024: 11:00 am @ Imperial College, London

Abstract: The growing complexity of wireless networks has sparked an upsurge in the use of AI within the telecommunication industry in recent years. AI has been associated – in the communication engineering community and beyond that – mainly with Machine Learning, in fact more often with Deep Learning, a subset of Machine Learning. In my research team, we advocate that the breadth and possibilities offered by the AI field are such that many other aspects, tools and theories from this rich area can bear fruit in the analysis and design of future networks. A couple of examples of such alternative AI techniques that we use in my lab, are Explainable AI (XAI) and Agent Based Modelling (ABM). As a first example of the above, using real-world data to develop an AI model for Short-Term Resource Reservation and Robust Network Intrusion Detection, we demonstrate how our XAI methodology can be used to explain the real-time decisions of the model, to reveal trends about the model's general behaviour, as well as aid in the diagnosis of potential faults during the model's development. As a second example, we consider ABM as a bottom-up modelling approach, which we use model the communication aspects of a road traffic management system as an example of a Cyber Physical System. We model, analyse, and compare various Medium Access Control layer protocols for uncoordinated and coordinated road intersection scenarios.

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Venue: Gabor Seminar Room (EEE 611), Dept. of Electrical and Electronic Engg., Imperial College London,

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