



**YEDITEPE UNIVERSITY**  
**Faculty of Engineering**  
**Electrical and Electronics Engineering Seminars**

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**A WIRELESS NETWORKS FLEXIBLE ADAPTIVE MODULATION and CODING TECHNIQUE in ADVANCED 4G LTE**

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**Abstract:**

As the need for mobile services continues to explode, mobile wireless networks must expand greatly their capacities. The capacity of 4G cellular wireless networks like LTE-A (Long Term Evolution Advanced ) can be increased by larger bandwidth, higher number of antennas for more spatial multiplexing, reuse of radio cells and in general optimisation of the network configuration. Methods of capacity expansion divide into three general categories: the deployment of more radio spectrum, more intensive geographic reuse of spectrum and increasing the throughput capacity of each MHz of spectrum within a given geographic area. The topic describes these several basic methods to intensify mobile wireless capacity. The potentially higher capacity will be achieved only if the whole wireless network can be more flexible to the existing real environment at any time. Appropriate linear or nonlinear flexible AMC (adaptive modulation and coding) techniques which are able to identify these changes are described for wideband linear power amplifier, multiple input multiple output antenna systems, heterogeneous networks and self-organising networks including the corresponding realisation and performance aspects. Different adaptive techniques have been presented for different layers of a cellular wireless network based on the LTE-Advanced standard. These techniques are working on top of each other and have to cover a large time scale in order to react appropriately to the different environmental changes, e.g., in the radio channel and in the user traffic. 5G (5th generation mobile networks) denotes the next major phase of mobile telecommunications standards beyond the current 4G Advanced standards. 5G has speeds beyond what the current 4G can offer. The Next Generation Mobile Networks Alliance defines the following requirements for 5G networks: Data rates of tens of megabits per second should be supported for tens of thousands of users, 1 gigabit per second to be offered simultaneously to many workers on the same office floor, several hundreds of thousands of simultaneous connections to be supported for massive sensor deployments, Spectral efficiency should be significantly enhanced compared to 4G, Coverage should be improved, signalling efficiency should be enhanced, Latency should be reduced significantly compared to LTE. The Next Generation Mobile Networks Alliance feels that 5G should be rolled out by 2020 to meet business and consumer demands. In addition to providing simply faster speeds, they predict that 5G networks also will need to meet the needs of new use cases, such as the Internet of Things (network equipment in buildings or vehicles for web access) as well as broadcast-like services and lifeline communication in times of natural disaster.

**Biography:**

I am currently employed as Asst. Prof. in College of Computing and Informatics, Saudi Electronic University, Kingdom of Saudi Arabia (KSA), since August 2015. I was awarded Ph.D. (CE/IT-2013) by the School of Computer Engineering/Information Technology, Shobhit University, India. My thesis was entitled "A Novel Strategy for High Throughput in Wireless Ad-hoc Network". M. Tech. (IT-Wireless Communication and Computing, 2005) awarded by Indian Institute of Information Technology (IIIT), Allahabad, India. B.E. (ECE-2002) awarded by Dr. B.R. Ambedkar University, Agra, India. I have experience teaching all-level students in a variety of settings. It is my goal to combine my range of experience with my ability to be a compassionate, enthusiastic teacher who will make a positive contribution to academic and research organization and larger community.

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**Date: 24th July 2020 Friday**

**Time: 15:30**

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