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Differential modulation in cooperative communications

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Internet of things (IOT) is emerging as the next technology supporting communication among things like machines, animals and human beings. By connecting billions of objects, a communication infrastructure that has low power consumption and low hardware complexity is required. Wireless sensor network is a network consisting of large number of sensors that can sense the environment and control physical phenomena. By using WSN with simple, inexpensive and low powered sensors, the IOT can be brought to very small objects. Differential modulation is a simple scheme that eliminates the need of channel state information (CSI) between the connecting objects. The basic idea of differential modulation is based on decoding the information by comparing the phase of a symbol with that of the previous symbol. Due to the absence of channel estimation procedure, the hardware complexity of the receiver is reduced and consequently the power efficiency is increased. The simplicity and efficiency of differential modulation has made it an attractive practical solution, with many standard technologies having adopted it, e.g., IEEE 802.11 and Bluetooth. In this talk, we will review the differential modulation and its potential in various applications. Further we will discuss the recent investigations and analyses on the performance of differential modulation in different communication scenarios and especially in cooperative communication scenario. Also, the effect of different channel fading models and object mobility on differential modulation will be discussed.

Biography

Sara AlMaeeni is a Research Associate and a Doctoral student in Communications Engineering in Khalifa University of Science, Technology and Research (KUSTAR). Her doctoral work is investigating non-coherent system in cooperative wireless communications. She received her Bachelor's degree in Communications Engineering from United Arab Emirates University in 2008 and her MSc degree from KUSTAR in 2012. Her most research interests include cooperative communications, OFDM, error correction codes, MIMO communications, vehicle-to-vehicle communications and space-time coding. She received the "Young Emirati Postgraduate Research Students Mobility Award" in 2014 and "Young Emirati Researchers Prize" in 2013 from National Research Foundation (NRF).

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