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Energy Efficiency Optimization for Multiple Input Single output in Wireless Communication

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ABSTRACT

Rapid growth in mobile computing and other wireless multimedia services is inspiring many research and development activities on high speed wireless communication systems. Main challenges in this area include the development of efficient coding and modulation signal processing techniques to improve the quality and spectral efficiency of wireless systems. In this paper we present the new scheme with using the optimization process for the channel selection for multiple input single output channels to improve the energy efficiency in the wireless network.

Keywords:- Optimization, Multiple input single output, Energy, Signal to noise ratio, OFDM, Bit error rate.

INTRODUCTION

Wireless Mesh Networks (WMNs) have become the focus of much research since they allow for increased coverage while retaining the attractive features of low cost and easy deployment. WMNs have been identified as key technology to enhance and complement existing network installations as well as provide access where traditional technology is not available or too costly in install [1]. A WMN is made up of mesh routers (MRs), which have limited or no mobility, and mesh clients (MCs) which are often fully mobile. The mesh routers form the backbone of the network allowing the clients to have access to the network through the backbone. We propose an algorithm for fair scheduling in WMNs with multiple gateways. We also propose another algorithm for scheduling which places more emphasis on throughput while retaining a basic level of throughput called mixed-bias. This technique biases against characteristics of the network which are detrimental to performance, fairness, or both.

A typical communication system consists of a transmitter, a channel, and a receiver. Space-time coding involves use of multiple transmit and receive antennas, Bits entering the space-time encoder serially are distributed to parallel sub-streams. Within each sub-stream, bits are mapped to signal waveforms, which are then emitted from the antenna corresponding to that sub-stream. The scheme used to map bits to signals is the called a space-time code. Signals transmitted simultaneously over each antenna interfere with each other as they propagate through the wireless channel. Meanwhile, the fading channel also distorts the signal waveforms. At the receiver, the distorted and superimposed waveforms detected by each receive antenna are used to estimate the original data bits.

Multiple-input multiple-output (MIMO) technology, through the use of multiple antennas at the transmitter and receiver sides, has been an area of intense research for its promise of increased

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spectral efficiency and reliability. Through the application of multiplexing and diversity techniques, MIMO technology exploits the spatial components of the wireless channel to provide capacity gain and increased link robustness. Multiple-input multiple-output (MIMO) systems that utilize multiple antennas at transmitters and receivers can considerably increase link capacity as well as link reliability compared to conventional single-input single-output (SISO) systems. The advantages originate from the multiple spatial channels, which are provided by the multiple antennas together with the scattering environment surrounding the transmitters and the receivers. A general block diagram of MIMO systems is illustrated in below Figure, where MIMO encoder and MIMO decoder accommodate various MIMO coding/decoding schemes, such as singular value decomposition (SVD) and orthogonal space-time block coding (OSTBC). By applying different coding/decoding schemes, the self-interfering MIMO channel can be converted into a set of parallel sub-channels, over which separate data streams are transmitted.

In wireless communications, fading is deviation of the attenuation affecting a signal over certain propagation media. The fading may vary with time, geographical position or radio frequency, and is often modeled as a random process. A fading channel is a communication channel comprising fading. In wireless systems fading may either be due to multipath propagation, referred to as multipath induced fading, or due to shadowing from obstacles affecting the wave propagation, sometimes referred to as shadow fading. The presence of reflectors in the environment surrounding a transmitter and receiver create multiple paths that a transmitted signal can traverse. As a result, the receiver sees the superposition of multiple copies of the transmitted signal, each traversing a different path. Each signal copy will experience differences in attenuation, delay and phase shift while travelling from the source to the receiver.

The rest of this paper is organized as follows in the first section we describe an introduction of about the mobile ad-hoc network and their application. In section II we discuss about the various routing mechanism specially trade off network, In section III we discuss about the proposed work and experimental solutions for the route discovery in vehicular ad-hoc network, finally in section IV we conclude the about our paper.

II OFDM (ORTHOGONAL FREQUENCY DIVISION MULTIPLEXING)

The OFDM (orthogonal frequency division multiplexing) system is one of the MC (multi-carrier) systems which divides one high speed data stream into several low speed data stream in parallel and transmits them by many sub-carriers at the same time. So the symbol duration of each low speed data stream is lengthened. Modulation and demodulation of OFDM system can be made in the FFT (fast Fourier transform) processor so that the transceiver of OFDM can be effectively implemented in the digital domain. It also has an advantage that can avoid the interference among subcarriers by inserting the guard interval longer than delay spread of channel.

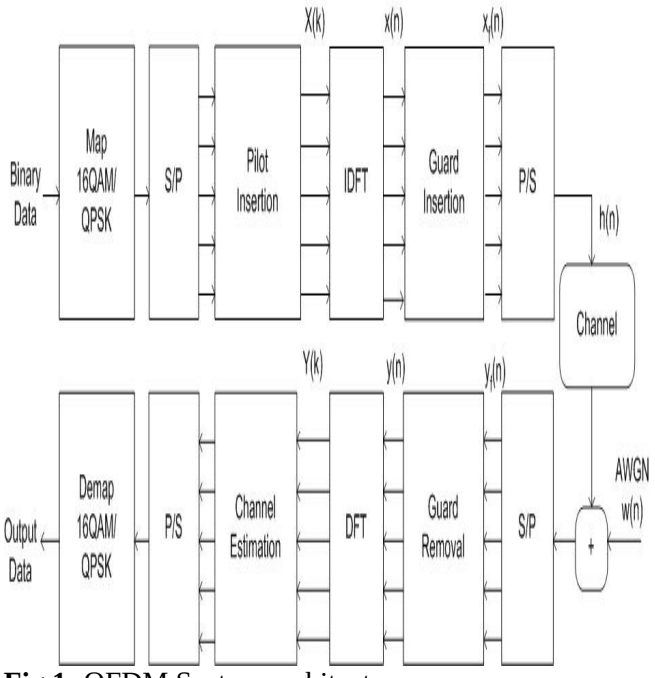

Fig 1: OFDM System architecture.

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OFDM is a digital modulation scheme in which a wideband signal is split into a number of narrowband signals. Because the symbol duration of a narrowband signal will be larger than that of a wideband signal, the amount of time dispersion caused by multipath delay spread is reduced. OFDM is a special case of multicarrier modulation (MCM) in which multiple user symbols are transmitted in parallel using different subcarriers with overlapping frequency bands that are mutually orthogonal. The overlapping multicarrier technique implements the same number of channels as conventional FDM, but with a much reduced bandwidth requirement.

III PROPOSED WORK AND RESULT

For an energy-constrained wireless network, energy harvesting (EH) is a promising technology to prolong the network life. In this work, we propose a WPC network consisting of one H-AP and *K* wireless nodes where EH among nodes is also performed. At the same time, we propose two EH schemes for this WPC network. In serial EH (SEH) scheme, the *k*th node only harvests energy from the previous *k*-1 transmitting nodes and goes to sleep after data transmission. In circular EH (CEH) scheme, the *k*th node not only harvests energy from the previous *k*-1 transmitting nodes, but also from the following *K*-*k* nodes. Although CEH can always achieve better performance, it is more complicated than SHE and requires the energy harvester to be turned on all the time without sleeping. Therefore, the proposed schemes can offer different tradeoffs between performance and complexity, and can be applied to different scenarios.

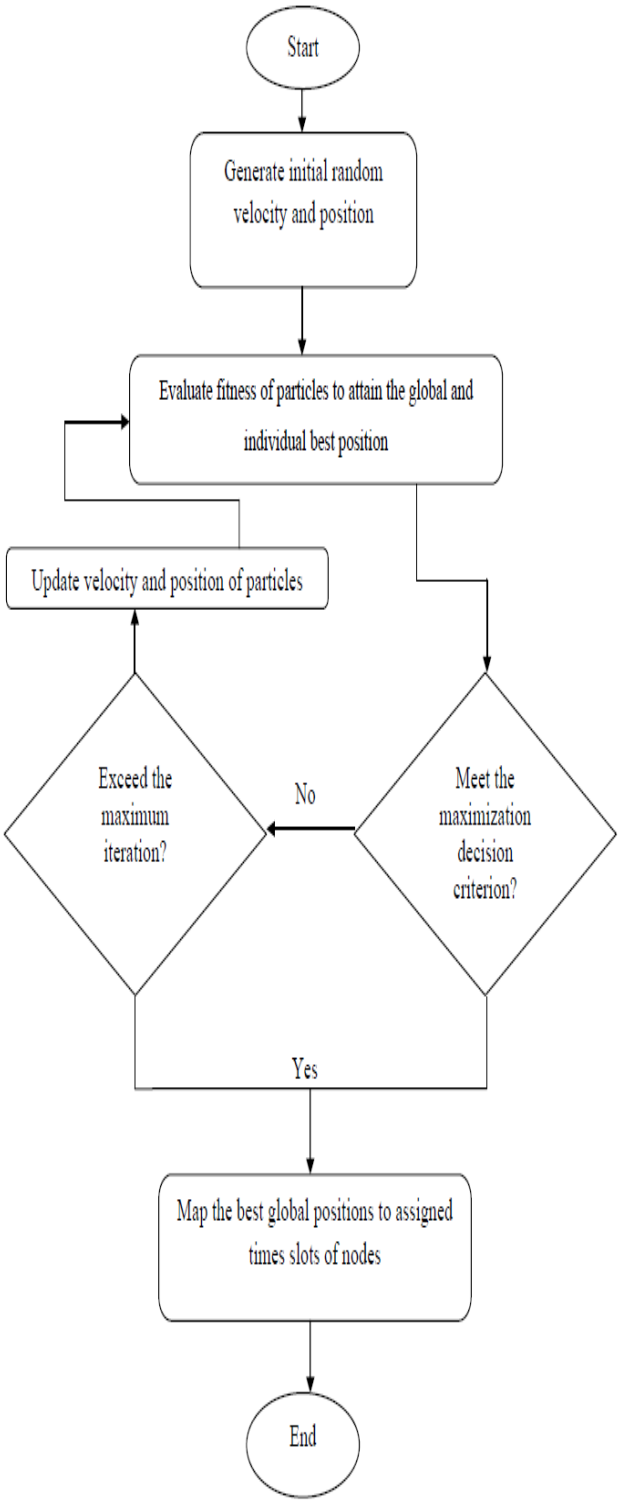

Fig 2: Proposed scheme model.

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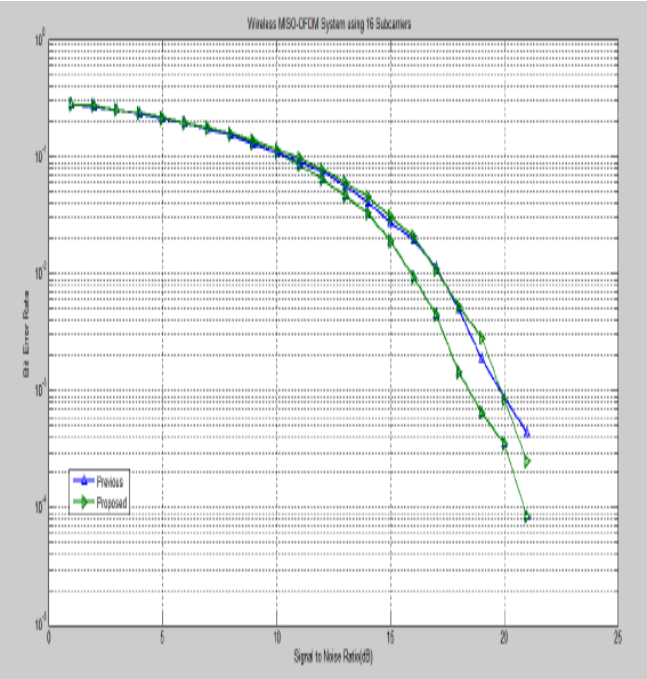

Fig 3: Show the result for Wireless MISO-OFDM.

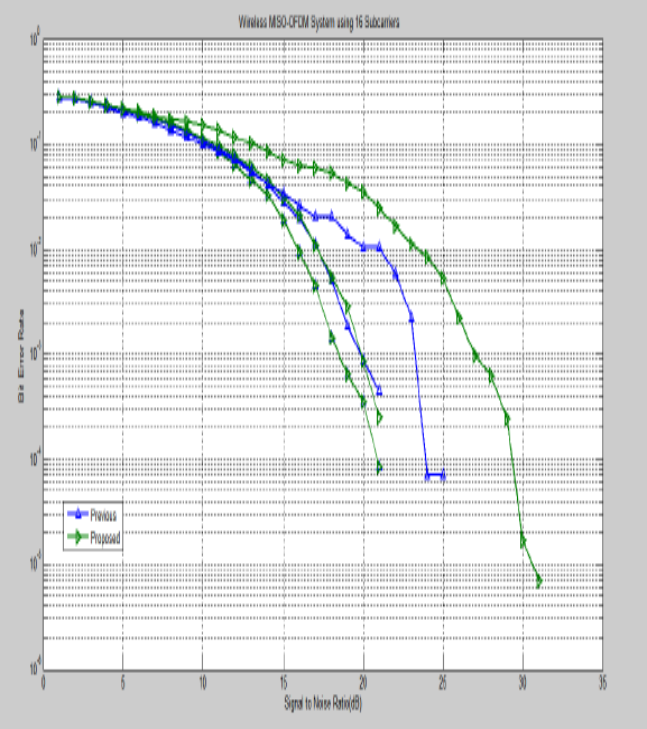

Fig 4: Show the result for Wireless MISO-OFDM.

IV CONCLUSIONS

Wireless energy transfer (WET), where receivers harvest energy from radio frequency (RF) signals, is considered to be a promising solution for prolonging the lifetime of wireless devices. The explosive growth of high-data-rate applications and services has triggered a dramatic increase in the energy consumption of wireless communications. In this paper we present the optimization method for the channel selection in wireless network and improve the rate of energy efficiency for the multiple input single output.

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