Opportunistic Scheduling and Spectrum Reuse in Cellular Networks Based on a Diversity of Relay

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ABSTRACT:
Due to the increasing need for high-rate service and maintain the quality of service in wireless networks, wireless telecommunications world is now moving into the fourth generation of the third generation. Contacts fourth-generation wireless communication system requires a maximum of efficiency. In order to develop strategies to increase the efficiency of payment that requires analysis of opportunistic scheduling and spectrum reuse in cellular networks based on a diversity of relay. One of the devastating effects of wireless communication systems is fading. To address the problem of diversity uses. Fade the diversity of ways of coping with adverse effects and improve the performance of the system. In line with the diversity and multi-system planning and optimize spectrum reuse in relay-based cellular networks has been tried that in this paper analyzes the spectral efficiency performance in a multi-channel to be dealt The results stated that the procedure was done very good performance even with a small number of users in the Fade is Riley. Orthogonality between sub-channels in frequency relays operate based on the frequency of the source and relay.

KEYWORDS: Reuse of the frequency spectrum, opportunistic scheduling, radio resource management

1. INTRODUCTION

The use of a diversity of wireless communication networks will improve performance. Therefore, a user on the network in addition to the signals that are sent directly to the recipient indirectly through one or more other users of the cooperative are also sent to the user the collaboration between users takes place in many ways. It also increases the number of users in terms of spectrum reuse techniques using physical channel, which will lead to increased productivity. Cooperate between users is the need to manage resources. Due to factors such as increased Mzlaty error, Fade, a small number of users, the users are concentrated in discrete regions of the cell, etc that there is no relay in cellular networks requires analysis of common challenges such as load balancing, routing, cellular and cellular interactions. The results stated that the procedure was done very good performance even with a small number of users in the Fade is Riley. Orthogonality between sub-channels in frequency relays operate based on the frequency of the source and relay. Focus on resource allocation in OFDMA frequency multiplexing is done in order to improve spectral efficiency. By dividing the multiple sub-carrier OFDMA techniques symbols and send them simultaneously, a way to cope with the adverse effects of propagation is very robust and efficient. [1], [2]

2. NETWORK ARCHITECTURE

Rapid deployment of broadband wireless access networks with cellular coverage area is great work. In the context of a cellular network can be a springboard to leverage the capacity, coverage and reliability is better. For example, a cellular network architecture is shown in Figure 1. There is an important role for the Sakhthayy such as wireless terminal relays data between users and systems that contribute to quality enhancement half-way between the users [3].

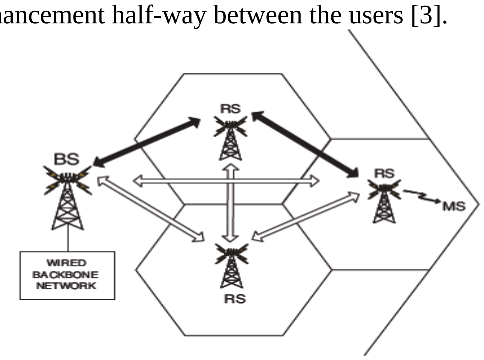

Fig. 1. Model Chndprshy relay in mobile wireless networks

3. DEFAULT PROTOCOL

Start of relays in multi-player mode, focused on the single-cell model systems MBC (with a BS, a constant and U + V RS users who receive information from the BS) are considered in a separate communication is shown in Figure 1. Members are divided into two categories:

U far users and V near users are shown and are selected for high-quality connections. The upgrade RS to point link quality to the users in terms of capacity, coverage and reliability of routing techniques are used. RS also makes the BS to communicate in more than one way to move users away. The two jump processes, BS sends the data to the RS, the RS, while the capacity of the wireless connection has begun to decode. RS data back to the data source and the possible presence of a second springboard BS transmits to remote users. (Eg, decoding data and moving forward based relaying protocols is assumed.) Meanwhile, users of the data directly to the BS with the RS may receive the same bandwidth. As a springboard into the routing protocols because most terminals cannot transmit and receive simultaneously relay restrictions should be considered. As a springboard to a broadcast channel MBC Channel Relay is a special case will be discussed. [4], [5]

4. CHANNEL MODEL ASSUMPTIONS

The channel model is assumed that the additive Gaussian white noise connections than by MBC (AWGN) are destroyed. Furthermore, the connection between the BS and the users of these frequencies are assumed to be a multiple of the users has been fading. [6]

5. SPECTRUM REUSE POLICIES

Considering the problem of resource allocation and time allocation to users, and users MBC close the fact that we received for more than one slot bandwidth is shared. Transfer problem involving three types of connection: Wireless connection between RS and BS, RS and connection between the users and the connection between the BS and the users. How to re-use time allocation policy is shown in Figure 2. [7]

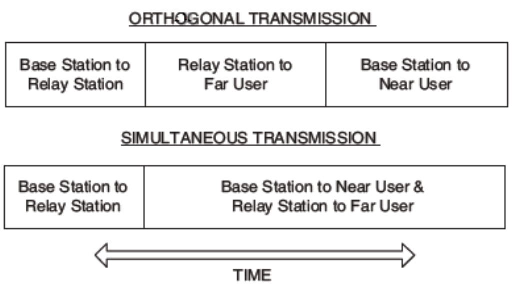

Fig. 2. Time allocation policies for multiple transport protocols simultaneously jumping on and Orthogonal

6. TRANSMISSION OF ORTHOGONAL

The orthogonal transmission (no re-use of spectrum) when connections are active links to various resources and are sharing the same time. Community input and output of discrete-time signals to users, the following equation is obtained.

$$y_{F,u} = \sqrt{SNR_F^{(r)}}\, g_{F,u} s^{(r)} + z_{F,u} \quad (1)$$

The signal received by the users, the following equation is obtained. [8].

$$y_{N,v} = \sqrt{SNR_N^{(b)}}\, h_{N,v} s^{(b)} + z_{N,v} \quad (2)$$

7. SIMULTANEOUS TRANSMISSION

The simultaneous transmission (Reusing range) above the active connection, a fraction of the time. While connections are simultaneously active over time. Received signal for the remote user in the discrete-time input and output of the band is derived from the following equation.

$$y_{F,u} = \sqrt{SNR_F^{(r)}}\, g_{F,u} s^{(r)} + \sqrt{SNR_F^{(b)}}\, h_{F,u} s^{(b)} + z_{F,u} \quad (3)$$

The following equation is obtained for the downstream user.

$$y_{N,v} = \sqrt{SNR_N^{(b)}}\, h_{N,v} s^{(b)} + \sqrt{SNR_N^{(r)}}\, g_{N,v} s^{(r)} + z_{N,v} \quad (4)$$

Figure 3 is a model of relay-based cellular relay networks. [9]

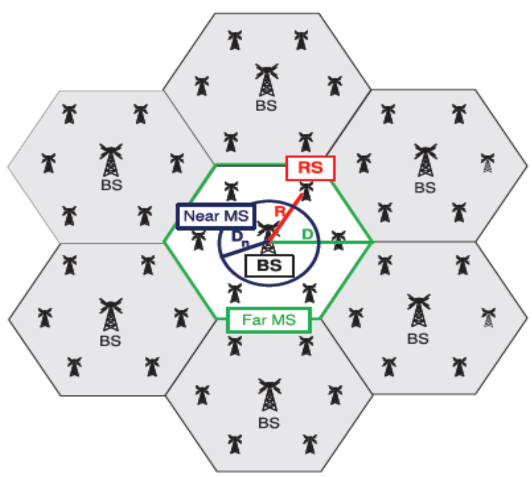

Fig. 3. Relay network model based on a multi-cellular

8. RESULTS OF THE SIMULATION

In this episode of the 7-cell network in Figure 3 will come out. The values of M = 6 and D = 1.6 km and R = 1.2 km and a maximum range of 600 meters near the user (Dn = 600m). Time-sharing coefficients are constant in all cells.

As seen in Figure 3 by the users BS in primary cells using a single transport protocol service are jumping. While users are on the edge of the main cell by using two selected RS Jumping transfer protocols are put in service. Orthogonal transmission and the transfer is done with varying degrees of BS and RS. Performance characteristic spectral efficiency and reuse in OFDMA multi-cell environment is the presence of opportunistic planning policies.

The connection log normal shadowing path loss and frequency selective fading Fade makes a special power and is characterized by delayed. OFDMA-based signaling is also done. Over the channel where K = 16 is presented below.

Log-normal shadowing with standard deviation of 4 to connect the RS-BS and BS-MS and RS-MS links 8 is considered. The fading frequency selective fading are also considered in connection with four independent paths (L = 4) with Gaussian distribution characteristic of complexity is exponential delays.

In Figures 4, 5 and 6 and the spectral efficiency of orthogonal transmission protocol and the transmission as a function of the users near and far will be compared.

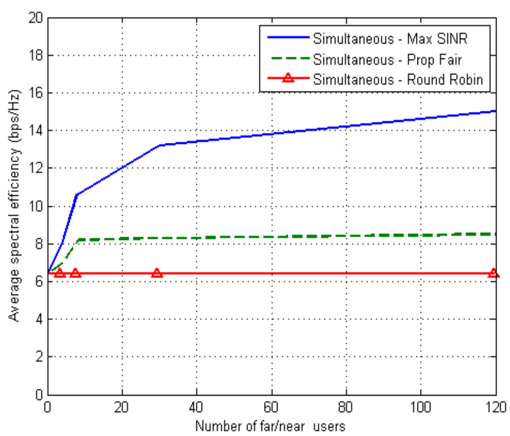

Fig. 4. Compares the spectral efficiency of the transmission protocols, in terms of re-use of spectrum

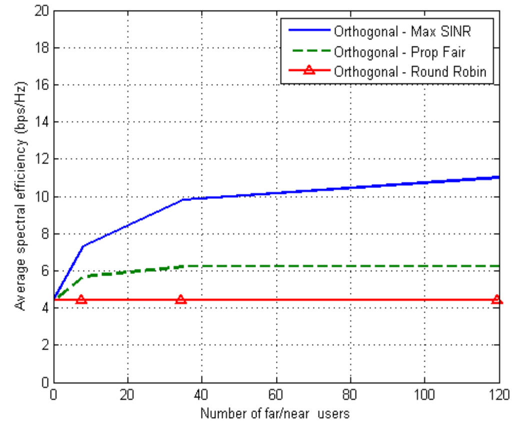

Fig. 5. Comparison of spectral efficiency under the orthogonal transmission protocol, re-use of spectrum

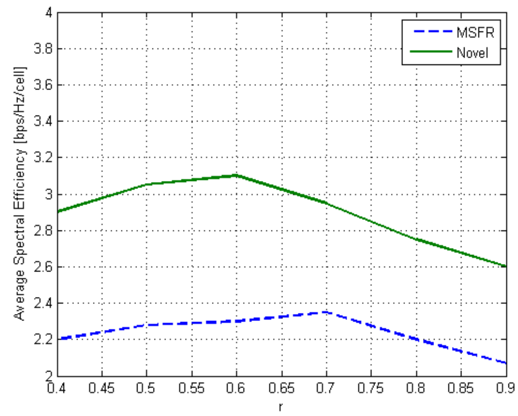

Fig. 6. The average spectral efficiency of the design spectrum reuse and conditions of use

Simulation results clearly show that in addition to the benefits of multi-spectral capacity in cellular networks with reuse between BS and RS is made fully compatible with the analytical results. In particular, the perceived value of design reuse and the transmission range of the relay is BS and RS have led to efficiency and spectral efficiency that are appropriate orthogonal transformation efficiency is over 40%. Furthermore, it is shown that the spectral efficiency and reduces the sensitivity to the number of users on a variety of actions.

The reuse of spectrum for relay service users, leading to improved performance.

9. CONCLUSION

This paper analyzes the spectral efficiency performance was studied using opportunistic scheduling and spectrum reuse techniques in planning for relay based cellular networks.

An analytical framework on MBC Network Interfaces with any other network and will review the Fade and it

was concluded that the model is accurate even for a small number of users. The framework for a multi-cell system with a network in the presence of frequency selective Fade OFDMA method using the method.
The study was carried out in a special performance routing and policy reuse Chndprshy spectrum shows the presence of multiplicity. It also identifies a number of key design consideration in resource allocation and management of resources was a relay-based cellular networks.

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