Review Paper On Near Far Problem and Their Solution

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Abstract: In this review paper, we are focused on the different technologies that are used to remove the near-far problem in wireless communication. Near-far problem effects the communication in the cell or outside the cell because the single can’t reach properly to the receiver or sender. There is different kind of method that is used to remove the near far problem. Guard zone is created in the network to overcome the near far problem. Exclusion zone is also used with guard zone to remove the effect of the near far problem. Many users observed that near far can be overcome by the 2 way one is too used the MAC protocol and other is the power control of the signal. MAC protocol is used in different ways by different users. And power control is also done in many ways like open loop, close loop, by defining the Hybrid access point for all the users in the cell. The near-far problem will be solving by adjusting dynamic output power at the transmitter end. Sequential Interference Cancellation (SIC) Algorithm is also used to use to remove the near far problem.

Keywords: Near Far, CDMA, Zone, communication, channel.

I. INTRODUCTION

There is a large difference between the transmission power and the receiver power of the signal. That reason is near the transmission pseudolite their stronger magnitude than the satellite signal power so the satellite signal detection is difficult that call the near problem. And when the receiver are moving away from the transmission pseudolite then the signal power and signal strength are decreasing because there are a lot of interference between transmission pseudolite and receiver pseudolite. So we are facing the problem in signal detection that called the far problem.

In the near-far problem the receiver is capable to detect the strong signal so the weak single is not detected properly by the receiver. Near-far problem is more difficult in the CDMA[3] where the frequency and time both are shared between no. of the user .The receiver can detect the weak signal in the presence of strong signal, but their limited dynamic range in which you can detect the signal weak signal that is most important long term issue in single receiving. The near-far problem can refer to a specific case in which ADC resolution limits a range that can be in that direct sequence spread spectrum (DSSS) of CDMA .At the receiver end ADC reduce its gain to prevent the ADC saturation because of these saturation the weak signal are fall in the noise of ADC.

II. NETWORK

The demand of wireless networks [4] are increase day by day .CDMA is the most effective network access method after the TDMA, FDMA. CDMA is used by the USSR in 1935. But it is in used in 1957 for the military purpose by Leonid Kupriyanovich .CDMA can be used in two way one synchronous and asynchronous[3].
In the synchronous CDMA the user data are modulated the signal with the help of XOR. In the synchronous these signal at sender end and receiver end both area belonging to same phase. But in both are belonging to different phase.

DS (Direct sequence) CDMA[3] systems, at the transmitter end users multiplied his own signal with the common carrier signal the user signal are called them spreading signal. In a DS CDMA system all the users transmit data simultaneously by using the same carrier frequency. Each user has its own data (spreading signal), which is approximately different to the data (spreading signals) of all other users. Receivers performs demodulation operation to detect the own data in the carrier signal. The data from other users behave like the noise due to demodulation. At the receiver end the sender data is must required to demodulate massage from the modulated signal. Each user done his work independently without know the other users data.

III. METHODS

1) Guard Zone & Exclusion Zone

Guard zone [5][6] issued to remove the near far problem in the ad hoc network with the help of DS-CDMA. guard zone are present around the mobiles and it prevent the other mobile to present in the range of other zone. In these paper we used the nakagami fading for the signal. Fading basically define the how much signal can be fad and what it present after fading at long distance. The fading is set in such a way that the signal is reach at the long distance. In the exclusion zone there are not any physically mobile areas present.

Outage probability of the function will be defined with fading, without fading, guard zone without guard zone versus the signal to noise ration. The outage probability is low with guard and without fading. the transmission capacity[7] of the signal are increase when it is used with guard zone and fading and spreading in exclusion zone. No of mobile are constant in the exclusion zone guard zone is most useful with unspreading network.

2) MAC Protocol

Ad hoc network most required to give the high throughput at low power consuming. The MAC [8] protocol compete with distributed coordination function (DCF) mode of the IEEE 802.11 standards [9]. MAC protocol achieve at target. In 802.11 only one transmission can take place at one time. Code reuses [10] are done in the large network but all the neighbors are used the different code in CDMA [11]. This protocol area can be used as receiver based approach which has its own disadvantage uncast of massages that are received in broadcasting. Primary collisions are also in transmission. Protocol is used transmitter based collision are not possible. In that case the receiver side is very complex and expensive.
In the 802.11 the throughput of the network are less than the CA-CDMA. But the energy required to generate the packet is required much more high in 802.11 than the CA-CDMA.

3) Power Control
Capacity limitation of the analog cellule stared in the 1987.when the power are no control two problem are mainly facing that are signal to noise ration and bit error rate after power control both are decrease. There are two main objective of power control [12] one is to send the signal to all users with same capacity and second one is the receiver signal strength is not depended not the fading and shadow effect of the transmitted signal. Power control can be done with help of the open loop power control [13] and closed loop power control. Power in open loop is adjust at the transmission end because they’re not any feedback are required. After signal sending it response very quick and in analog nature of signal it dynamic range is 80db.The receiver and sender both are in depend with each other in power control. Close loop [12] power control feedback must required. It is sort of ‘fine tuning ‘on the open loop. Close loop work with fast fading.

Forward link power control is used to control the interface outside the cell. It minimized the power consuming for better performance. It finds the frame error rate.

4) Channel Estimation
When extra White Gaussian Noise are added in the signal the performance are measure on the bases of the Mean Square Error (MSE) and Symbol Error Rate (SER) [14].channel estimation based on the time domain and in slow fading the general model are used. These can be done with the help of the two methods. LS (Least Square estimator) and MMSE (Minimum Mean Square Error estimator).These methods are working in the asynchronous DS-CDMA.

Michael Meyer [15] takes the risk and compares the various result of the simulation for channel estimation. There are some problem facing in the channel estimation due to the high and low frequency level of the different users. Moving average (MA) FIR filter as the Channel Estimation Filter (CEF) used for the channel estimation [14] [16].
LS are very simple because it done not required correlation function calculation and matrix inversion. But MMSE required the both for calculation that by it complex.

5) Maximum Throughput
To achieved the maximum throughput [17] in the network. We must required the power control of the signal with the help of the Hybrid access point we can provided the constant power supply to each and every user. Hybrid access point firstly send the downlink to all the mobile broadcast equal energy. And after receiving the signal all the user send the independent response to the Hybrid accesses point by Time Division Multiple Access.

We find the far distance required less energy than the near distance so needs to balance it by finding the common throughput for the entire user. And send the message to the entire user with equal energy power.

6) Cell Breathing
In a single cell there are a single access point that providing the frequency to the entire user in cell. The same thing applies on the other cell but there are near far problem in the communication. When the frequency of the different cells [19] are overlap to each other that are create the problem of interfacing between cells. We define the frequency range of the cells.
According to the need of the user the cell is shrank and spread. The solid boundary of the AP1 show the shrinking of the cell and in AP2 it shoes the spreading of the cell. But it doesn’t solve the near far problem properly. How many no of users in the cell it don’t depend on the breathing of the cell. In the small cell large no of user are available and in a large cell some no of user are available. So those create the problem.

Large no of user are available in the small area and in large area small no of user area available. It means high no user are sharing the small frequency and small no of user are sharing the high frequency. So there are no of problem that are high packet loss rate, Low throughput, transmission delay for packets, increased retransmissions, increased Collisions loss .To overcame these problem we must required the frequency reuse and frequency sharing. And the frequency adjustment can be done properly and in effective manners.

IV. CONCLUSION

In these paper we are discuses the various technology that are used to overcome the near far problem in different way.

Maximum methods try to control the power in the cell and frequency of the cell. In some cases with the help of the frequency control interaction between the cell can be over

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