INTERNATIONAL JOURNAL OF PURE AND APPLIED RESEARCH IN ENGINEERING AND TECHNOLOGY

A PATH FOR HORIZING YOUR INNOVATIVE WORK

WIRELESS AND MOBILE COMPUTING

S .BHURA, EKTA CHOUDHARY

1. Assistant Professor, Department of CSE, BNCOE, Pusad (India).

2. ME Student, Department of CSE, BNCOE, Pusad (India).

Abstract

Technology has developed rapidly over a last twenty years. This development has still not given the user the freedom to access data anywhere or anytime he wants because of the limitations like the change in location resulted in either routing problems or connection breaks. The advent of Mobile Computing has given birth to hopes of overcoming the above limitations these mobile networks have facilitated communication anywhere in the world at any time. The word Mobile Itself. Illustrated what it does. These mobile networks provide communication even when the source and destination are constantly changing their location. Here we present the different basic and advance technologies of mobile computing. It includes

TECHNOLOGIES

CDMA – OFDM – MC – CDMA – PRINCIPLES – MERITS –DEMERITS. PROBLEMS IN UPLINK TRANSMISSION AND TO OVER COME THIS PROBLEM BY USING TDDMC – CDMA TECHNOLOGIES. Blue Tooth-WI-FI (Wireless Fidelity)

INTRODUCTION

MOBILE COMPUTING address those applications and technical issues that arise when persons more around within a region or country or travel between thecountries and continents. Over the past several years there has been increased interest in wireless communication systems that use code division multiple accesses (CDMA). The systems such as IS – 95 (Direct Sequence CDMA, DS-CDMA) and UMPTS (Wide band CDMA, W- CDMA) already use CDMA based techniques. On the other hand thanks to excellent multi carrier (MC) modulationproperties in the frequency selective fading ratio channels, MC techniques gained a lot of popularity lately. The orthogonal frequency division multiplexing (OFDM) as the most common MC technique has been chosen as the European standard fordigital audio broadcasting (DAB) and as the digital terrestrial video standard (DVB-T) (OFDM in DAB and DVB-T). Following this, a lot of researchwas devoted to the usage of hybrid schemes that use the benefits of both CDMA and MC. This led to the development MC-CDMA, MC – DS- CDMA and similar techniques that are suited for applications in future mobile communications. The MC – CDMA proved to be a suitable technique for the down link transmission. Uplink transmission, due to the more complex propagation conditions, introduces additional problems which results in harder applicability of MC – CDMA in uplink. The goal of this work is to explain the problems involvedin uplink transmission and to offer some solutions which enable us to use modified MC – CDMA as an uplink transmission technique. To overcome these problems in uplink transmission we use TTD – CDMA and compared to above techniques widely used present technologies is Blue – Tooth and Wi-Fi approach the remaining port of the paper is organized as follows. In Section -II the basic principles of CDMA, MC and hybrid techniques will be reviewed. In Section

- III main problems that occur in the uplink transmission are discussed andintroduces TDD MC – CDMA that uses pre – compensation algorithm in order toovercome some of the problems that occur in uplink transmission.In Section IV introduces a Blue Tooth and Wi-Fi

technology which provides short range wireless connectivity between common devices.

II. **Basic Techniques**

Basic Principles of CDMA, MC and hybrid techniques.

The above figure shoes the structure of DS – CDMA transmitter and receiver. InDS – CDMA each user is assigned a unique code sequence. Information signalsfor every user are added together and modulated by a RF carrier for transmission. Upon reception, the received signal is first demodulated and then multiplied by the unique code signal again and finally passed through a low pass filter to recover theoriginal data.


Direct sequence multiple access principle.
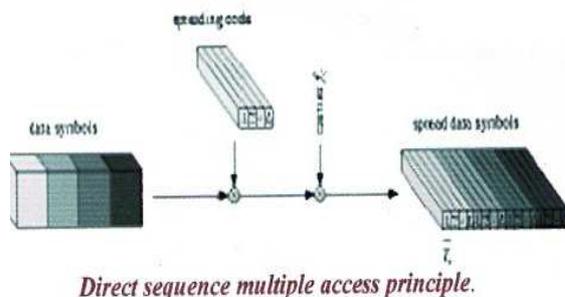
Disadvantage:-

It requires an exponentially complex algorithm which prohibits its use if thenumber of CDMA users is larger than about ten.

OFDM (ORTHOGONAL FREQUENCY DIVISION MULTIPLEXING)

It is included in high performance wireless local area network. There are however two disadvantages with using OFDM. Firstly the large number of carriers increases the peak to average power ratio of the signal, causing problems when amplified by a non linear amplifier. Secondly by having the carriers much closer together, the system becomes more sensitive to frequency, estimation errors.


Multi carrier modulation principle.
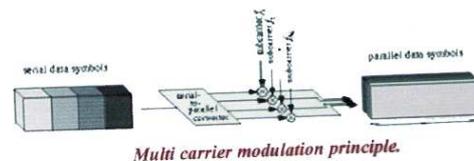
MC- CDMA

MC – CDMA is a combination of CDMA and OFDM techniques, its concept and stracture are somewhat similar to DS – CDMA mitigates the effect of ISI.

However unlike DS – CDMA whose ISI rejection is determined by autocorrelation properties of code sequence, this is achieved by increasing the code symbol length (in time domain) an modulating each code symbol using different sub – carries to keep the same data rate. This results in flat

feeding over each sub– carrier. The main advantage of doing this is when the multiple access inter foreface becomes a problem, the resulting linear detectors are much simpler to implement, as only a single tap equaliset is required for watch channel. Rake reception canalso be employed to exploit the channel diversity by channel matching in thefrequency domain allowing optimal reception for a single user.

In the uplink another advantage of MC – CDMA can be exploited. If thesignals can be synchronized within a small fraction of the symbol time (e.g.indoor, or very small cell environment) then this a synchronism can be overcome by cyclicly – extending the signal further allowing synchronous reception of all signals, with no ISI from other users.
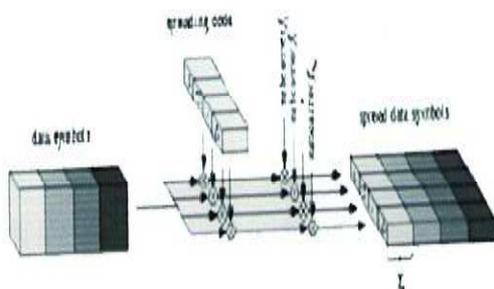
Multi carrier code division multiple access principle.

PRESENT TECHNOLOGIES
BLUE TOOTH

Blue tooth is the name of new technology that is now becoming commercially available. It promises to change significantly the way we use machines. Blue tooth essentially aims to fix this, it is a casle replacement technology. It is a wireless technology which provides shortage. Wireless connectivity between common devices. Bluetooth devices in the house are always communicating with one another as long as they are powered on. Each device sends out a signal, received by the other devices that are sending out their own signals. The devices scan all signals to see if any are addressing it. In this way, Bluetooth creates a personal-area network (PAN) in the home and the user is not required to do anything special to get the devices to speak to one another. They operate in a perpetual interactive mode by default.

For example, let's assume you are using your cell phone and headset while youcopy a DVD from your entertainment center to your desktop -- meanwhile your digital camera is offloading its contents to your laptop. The Bluetooth devices that have

business with one another will initiate their own separate PAN (also called a piconet) and synchronize a random hopping scheme to create interference-free communications. Known as spread-spectrum frequencyhopping, the devices will jump among 79 random frequencies within a specifiedrange, changing about 1,600 times per second in perfect unison. The likelihoodthat a device in another PAN will be using the same frequency at the same time is minute. Hence several individual PANs or piconets can operate in the housewithout interfering with one another. Each piconet can have 1 master and up to 7 slave devices. Future versions may allow linked piconets called scatternets.

Though other gadgets in the home might utilize the 2.45 GHz range,Bluetooth separates itself from these by using a very weak signal that "fliesunder the radar." Conversely these other products rarely cause interferencewith Bluetooth because frequency hopping keeps potential interference brief. The maximum bandwidth for any single channel or frequency is 1 megabyte per second

(1Mbps), while individual packets range up to 2,745 bits. There are currently three flavors or classifications of Bluetooth devices, relative to transmitting range.

 FUNCTIONS OF BLUE TOOTH.

1. **Advance Head set phone**

 Profile enables users to use a Bluetooth enabled head phoneto listen high quality stereo music played in computer.

2. **Basic Imaging**

 Basic Imaging using to receive pictures from a Blue ToothDevice such as digital camera, Mobile phone. It also enables remote control of shooting display and other imagingfunctions.

3. **Blue tooth Synchronization.**

 Synchronization profile enables users to Synchronize BlueTooth object on their computers with that of other BlueTooth enabled computer as well as Bluetooth EnabledMobile phones, PDA and other devices.

4. **Dial Up Networks .**

 Enables users to wireless dial up to internet through a BlueTooth or a mobile phone that support to the Own file. It onlyworks with certain GPRS Phones.

5. **Fax**

🗆 The Blue Tooth fax profile enables users to send fax from acomputer via a Blue Tooth enables mobile phone or modem.

6. File Transfer

🗆 File transfer enables users to transfer files and Car foldersbetween Blue Tooth enabled devices etc.,

7. Head Set

🗆 Head Set profile enables to use a Blue Tooth headset aswireless car plug or microphone.

8. Human interface device

🗆 Blue Tooth Human Interface Device profile enables users touses Blue Tooth Enabled Human Interface Device such as keyboard mice to control our computer.

9. LAN Access

🗆 Blue Tooth LAN access profile allows users to access OLANvia Blue Tooth enabled LAN access point.

10. Object Push

🗆 The Blue Tooth object push profile enables users to send andreceive personal information management (PIM) dataobject to and from a blue tooth enabled PDA or mobilephone.

11. Printer

🗆 The Blue Tooth printer profile enables your computer toconnect to a blue tooth enabled printer.

12. Serial Port

🗆 Blue Tooth Serial port profile (SPP) provides DCs Laptops,PDA's Graphics receiver, card less phones other enableddevices with a virtual serial port enabling them to connectwith each other wire lessly via Blue Tooth instead of a serialcable.

Advantages

Fast wireless data Transfers.Ability to communicate with devices that are not in a direct line ofsite.

Disadvantages

Because the technology new, it is expensive Security risks.

WI FI (Wireless Fiedlity)

What is WI Fi wireless LAN technology?

When I first transferred to George Mason University, I had no idea about using internet connections other than going through a phone line using AOL. At the Johnson center I noticed that many students had their laptops with them and most of them had some sort of blinking card attached to it. I alsonoticed that the

students were connected to the internet without using an Ethernet connection. I never quite understood what the blinking card wasuntil I took It103. Apparently these laptops have Wi Fi wireless LANtechnology. Wi Fi wireless LAN technology basically allows you to connect to the internet without the use of any wires. Anywhere within a base station, Wi Fi enabled computers can send and receives data indoors and out. The Johnson center is a base station; therefore any student who has a laptop with Wi Fi and is inside the building can access the internet. So can anyone use Wi Fi? Shockingly everyone can use Wi-Fi, of any computer skill level and almost everywhere in the world with the proper equipment. Many people use

home Wi-Fi networks which can connect multiple computers to each other, toperipherals such as printers, and to the Internet. Families can use a Wi-Finetwork to connect their computers together to share hardware and software resources. Therefore everyone in the family can share stored files, photos and documents and print them out on a single printer attached to one desktop computer, without any

wires at all. Small businesses are also taking advantage of Wi Fi networks. Businesses can connect between mobile salespeople, in store staff, and office workers who do the finance and accounting of the business. Wi-Fi networks also work well for small Businesses, providing connectivity between mobile salespeople, floor staffand behind-the-scenes finance and accounting departments. Because smallbusinesses are dynamic, the built-in flexibility of a Wi-Fi network makes iteasy and affordable for them to change and grow. Many hotels, restaurants,airports, and schools are now or soon will be providing Wi Fi access sopeople can use their computers in their facilities. Wi Fi is one of the fastestinternet connections possible.

This is a George Mason student using WI FI technology to access the internet.

How Does WI Fi Work?

The wide use of notebook and other portable computers has driven advances in wireless networks. The most conmen use for a wireless network is to connect a single notebook computer to a broadband internet connection. Wireless networks use either infrared or radio-frequency

transmissions to link these mobile computers to networks. Wi Fi networks use radio technologiescalled IEEE 802.11b or 802.11a to provide a secure, fast, and reliable wireless connection. IEEE stands for Institute of Electrical and Electronics Engineers, New York, which is a membership organization that includes engineers, scientists and students in electronics and allied fields. It has more than 300,000 members and is involved with setting standards for computers and communications. The international standard for wireless networking uses afrequency of 24-2.4835GHz. These frequencies are common in microwaves,and cord less phones. Wi Fi functions through a transmitting antenna which isusually linked to a DSL or high-speed land-based Internet connection anduses radio waves to beam signals. Another antenna, which is in the laptop or PC, catches the signal. The signal, usually l, has a range of about 300 feet for most home connections. The farther the user is from the signal, the slower the connection speed. Wireless LANS have capacity speeds from less than 1

Mbps to 8 Mbps. Wi-Fi can easilybe expanded in the home or business with the simple step of plugging in acard or a USB connection to the new computer or other Wi-Fi certifiedproduct. No cords or cables, or wires are necessary. With the spread of this new technology the future will provide faster Wi-Fi Protected Access (WPA) offers confidence and privacy to authorized users. WPA is a level of security that greatly increases the authentication and encryption of your wireless system. The system works by using an access point to block LANaccess until the user can be identified by entering a pass code. Once thecorrect pass code is entered the user can then begin surfing the net. This process willkeepunauthorized users from accessing the authorized users account and keep alldata safe and secured. Wi Fi telephones are also on the rise and soon will be widely available. According to The Wireless Ethernet Compatibility Alliance(WECA), 138 awards have been awarded to over 70 certified Wi-Fi LANproducts since March of 2000. With the continuation of this progress moreand more internet users will feel confident enough to upgrade from the outdated dial

up connection to the powerful Wi-Fi network. With these highquality performance products, the future will only become more functional foreveryone, everywhere.

There may also be potential problems that could occur in the future withWI Fi. With more people connected to WI Fi, the signals sent canbecome weaker causing a slow connection. Analysts are worried that the growing population of WI Fi users could possibly slow down the signalsmaking WI Fi inconvenient. Bibliography**.**

CONCLUSION

We conclude that the technology like TDD CDMA and blue tooth iswidely used in every sector like LAN's FAX etc., compare to these, theupcoming future is in the hands of Wi-Fi certified product the transaction only takes seconds compared to calling other sectors andwaiting for that person to research and call back with an answer. Thistechnology is great for fast customer service that everyone relay on.The process will connect buildings together with fast and new spreadingLAN technology it is convenient to access on-line information.

Wi-Fi LAN technology will one day be networked all over majorhighways, metro stations and every buses. Whatever the case may bewe will be able to access on-line service anywhere you go day ornight.

BIBILOGRAPHY

1. WIRELESS BROADBAND NETWORKS HAND BOOK-- JOHN R.VACCA.

2. WIRELESS NETWORKS – KAVEH PAHLAVAN –PRASHANTKRISHNAMURTHY IT TECHNOLOGY – MAGAZINE

3. WWW. MOBILE INFOR.COM

4. WWW. WI-FI PRESENTATIONS.COM