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Intelligent Cognitive Sensing System for Block Chain Technology

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Abstract :*Cognitive radio plays an important role in today's world, for an effective spectrum sharing and sensing mechanism. since block chain technology needs an secured and smart spectrum for data transfer. we developed the intelligent theory based on machine learning concept for the secured data transfer.we have developed and designed the machine learning based cognitive radio which works on the principle of quadfier architecture . The cognitive prototype has been developed using node MCU and zigbee transceiver.*
Keywords -*cognitive radio, block chain, machine learning, quadfier,zigbee and MCU*

I. Introduction

Blockchain is a growing list of records, called blocks, which are linked using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data. By design, a blockchain is resistant to modification of the data.Where as block chain technique has been used for the security transaction for the users. Here Intelligent Cognitive Systems Group focuses on developing machine learning and user experience technologies, and scalable solutions for smart systems, with realisation platforms ranging from embedded system to distributed cloud environments. Advanced sensor-based natural user interface is key to an effective solution the team strives to develop solutions that are user-friendly and can be operated intuitively.Blockchain technology provides new opportunities for redesigning the reputation system. Blockchain systems are very effective in preventing objective information fraud, such as loan application fraud, where fraudulent information is fact-based. However, their effectiveness is limited in subjective information fraud, such as rating fraud.

II. Literature Survey

In the fast-growing information technology, where people can exchange information, conduct business, and connect with others from all over the world. For example, Amazon had more than 285 million active users . With the availability of unprecedented amounts of information, the Internet provides convenience to its users. Additionally, it produces challenges for users in processing information. Consequently, intelligent systems are widely applied to assist users in decision-making.With built-in artificial intelligence in different knowledge domains, intelligent systems are capable of gathering information, processing problems, drawing inferences, and generating solutions. input information and different built-in algorithms, intelligent systems can be applied to support decision making in various domains, such as finance, transactions. Regardless of the problem domain, the decision made by the intelligent system depends on users' inputs. Therefore, decision accuracy is vulnerable to fraudulent users' input, which is termed as information fraud.

In this paper spectrum pricing and allocation problem, based on hierarchical game theory framework, is studied for cognitive block chain technology. The spectrum pricing and allocation are subject to constraints in the required transmission rate for heterogeneous constant bit rate and variable bit rate services. A hierarchical game theory framework is designed based on a Stackelberg game. In the two-level game framework, primary network operators are leaders and determine the spectrum price, while cognitive mobile terminals (MTs) are followers and allocate the spectrum resource. Then, the spectrum allocation among secondary MTs is solved by a Bargaining game, and the spectrum price is set by a Bertrand game. 1This is an important work for cognitive radio networks. In cognitive radio networks, the spectrum resources are scarcity and it is difficult to meet the QoS of secondary MT's requiremen1This is an important work for cognitive radio networks. In cognitive radio networks, the spectrum resources are scarcity and it is difficult to meet the QoS of secondary MT's requiremen1This is an important work for cognitive radio networks. In cognitive radio networks, the spectrum resources are scarcity and it is difficult to meet the QoS of secondary MT's requirements.Consequently, we adopt the Stackelberg game to solve it. In this paper, the spectrum pricing and allocation problem in cognitive heterogeneous wireless networks is studied based on the hierarchical game theory framework, in which MTs are assumed to have multi-homing capabilities. Specially, we summarize the contributions as follows The joint spectrum pricing and allocation problem, for constant bit rate (CBR) and variable bit rate (VBR) services, is formulated for primary network operators and secondary MTs. A hierarchical game theory framework is

proposed to maximize the payoff for primary network operators and the product-utility for secondary MTs. the spectrum allocation based on the cooperative Bargaining game is analyzed for secondary MTs, and the spectrum prices for primary network operators is set by the non-cooperative Bertrand game. A joint spectrum pricing and allocation (JSPA) scheme is presented. Simulation results demonstrate that the proposed JSPA not only improves the QoS for secondary MTs.

III. Existing system

Radio spectrum allocationin cognitive wireless network which utilizes the vacant spectrum to support the required bandwidth.Jointsepctrumand power allocationnot only deals with how to guarante the qos for secondary MTs,but also controls the interference power.spectrum allocation and pricing does not consider the cognitive characteristics.It only adopts the bargaining game.

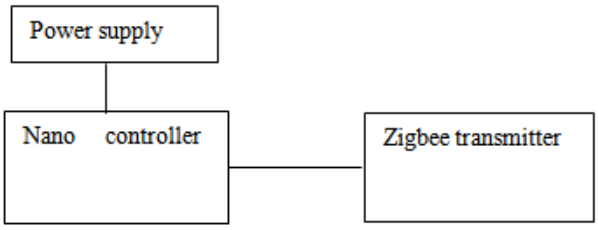
Limitations:

Block chain technology is not used in the exisitingsystem.there is no safety for the users
No intelligent algorithm is used.

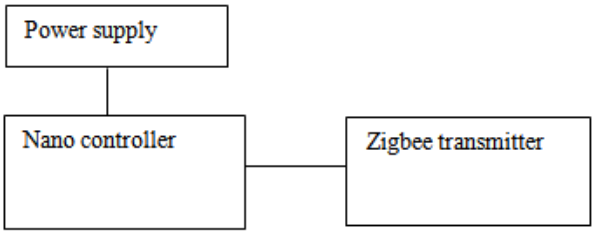
IV. proposed system

In this work, an intelligent technique has been used for the security of users.proposed system of this method should be on the fast transactios.avoidance of delay during transaction.this should applied for the certain distance.this method can be used to avoid the hacking by the hackers easily.here we are using the secured and smart spectrum for the data transfer.using of machine language in work.it should be based on the spectrum sensing.using this technology provides safety for users from the risk of fraud.

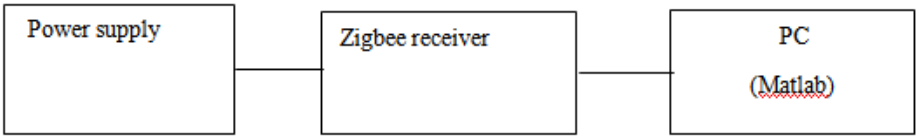
Transmitter 1:



Transmitter 2:



Receiver:



Description:

It consists of two electrodes with ZigBee transmitter that transmits the signal to the receiver through ZigBee.here we are using two transmiters for transmiting the signal. 9v dc power supply is applied to the transmitter .The delay should be received in the receiver side.here we are connecting the receiver by using the UART to USB cable .The output should be displayed in the system by using the Matlab software.

- **ZigBee transmitter:**

ZigBee is the ideal choice of protocol for automation and smart energy, because different ZigBee devices can be connected. As more ZigBee devices are linked, communication paths between devices multiply, eliminating the risk of single-point signal failure. ZigBee is an open, global standard for wireless communication between IoT devices. With ZigBee, IoT devices can easily be connected to other IoT devices. The ZigBee protocol is secure and stable, which is one of the reasons why it has become one of the world's most widely adopted protocols.

- **4.4 .ZigBee Receiver:**

The ZigBee standard is a standard built on top of IEEE 802.15.4 which provides the upper layers for control and sensor applications. It has been designed to be very robust so that it can operate reliably in harsh radio environments, providing security and flexibility. The distances that can be achieved transmitting from one station to the next extend up to about 70 metres, although very much greater distances may be reached by relaying data from one node to the next in a network.

The standard supports 64 bit IEEE addresses as well as 16 bit short addresses. The 64 bit addresses uniquely identify every device in the same way that devices have a unique IP address. Once a network is set up, the short addresses can be used and this enables over 65000 nodes to be supported.

Working:

In our project, we are going to detect the available vacant spectrum and use it efficiently for the fast transmission of data without any delay.Here, zigbee transmitter and receiver is used to acquire the signal and transmit it effectively.ZigBee transceiver is controlled by the node MCU microcontroller.

- **Nano MCU:**

The All new Node MCU ESP8266 V3 Lua CH340 Wi fi Dev. Board is a fast leading edge low-cost Wi Fi technology. Modern high-level mature LUA based technology. It is an integrated unit with all available resources on board. It is super simple to complement your existing Arduino projects or any development board that has I/O pins available .Modern Internet development tools such as Node.js can take advantage the Node MCU with the built-in API to put your idea on the fast track immediately.

Figure 4.Node MCU

Node MCU is built based on the mature ESP8266 technology to take advantage of the abundant resources available on the web**.** Node MCU has ESP-12 based serial Wi Fi integrated on board to provide GPIO,

PWM, ADC, I2C and 1-WIRE resources at your fingertips, built-in USB-TTL serial with super reliable industrial strength CH340 for superior stability on all supported platforms. This module is one of the cheapest available wi Fi-modules in the market. V3 or Version3 is the latest version of this module and it is a 32bit microcontroller.

- **Display:**

The output displayed in the matlabsoftware.The delay time should be displayed in the system.

Matlab:

MATLAB is widely used in all areas.This makes the software particularly useful for linear algebra but MATLAB is also a great tool for solving algebraic and differential equations and for numerical integration. MATLAB has powerful graphic tools and can produce nice pictures in both 2D and 3D. It is also a programming language, and is one of the easiest programming languages for writing mathematical programs. MATLAB also has some tool boxes useful for signal processing, image processing, optimization, etc.

- **Hardware used:**

Zigbee is an IEEE 802.15.4-based specification for a suite of high-level communication protocols used to create personal area networks with small, low-power digital radios, such as for home automation, medical device data collection, and other low-power low-bandwidth needs, designed for small scale projects.

Advantages:

For making bussiness benefits.
Grseatertransparancy.
Enchanced security traceability.
Increased efficiency.
Speed of transaction.
Reduced cost.
Inmutability(They cannot be altered or deleted)
Empowered uses(user are in control of theinformation and transaction

V. Result and Discussion

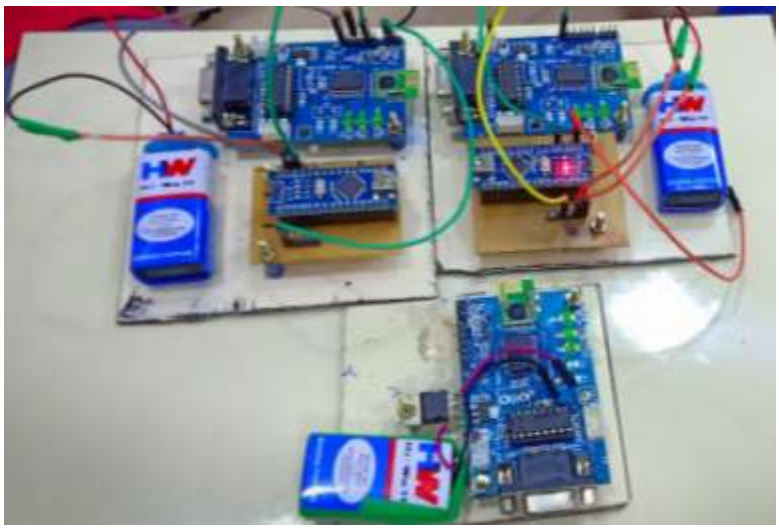


Fig. Overall hardware kit

Using this three Zigbee transceivers, data is transmitted and used for the data acknowledgement. From one packet to another packet it is transmitted easily.

VI. Conclusion

In this paper, we investigate the spectrum pricing and allocation problem with heterogeneous services for cognitive heterogeneous wireless networks. Each primary network operator adjusts spectrum price based on the spectrum consumption by secondary MTs, so as to maximize the payoff, while secondary MTs adjust

spectrum allocation based on the spectrum prices. In order to solve the above problem, we model the spectrum pricing and allocation problem as a two-level Stackelberg game theory, i.e., spectrum price competition among primary.

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