Enhanced Network Speed Channel Allocation for Spectrum Schemes Sharing in 5G Network

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Abstract

In 5G network has n number of user. The user can be separate from primary User and secondary User. A primary user is a license person. A secondary user has unlicensed person. A primary user to allocate the data for secondary user. A primary user is to allocate the spectrum of data to secondary User. The spectrum sharing method is easily convert data from one base station to another base station through the air medium. In data transfer some kind of interference created between primary and secondary user. In primary user update the details about how much of data are consuming secondary user and how much amount of data are lost that information storing in main server. The waste of 50MB data are storing in main server that data can be send to data needed person after When I reach a In this project fully focused on to recover the waste of data to be very efficient manner and to be concrete without loss of data. This is project compensate the amount of data. The lost of data transferring from one secondary user to another secondary user by using air medium.

1.INTRODUCTION

Thus, the demand of spectrum resources is expected to increase significantly in 5G networks. This requires wireless system designers to propose efficient spectrum management schemes of the data research directions to fifth generation (5G) networks [2]. 5G networks are intended to provide significantly high data rate access and guaranteed quality-of- service (QoS). Thus, the demand of spectrum resources is expected to increase significantly in 5G networks. This requires wireless system designers to propose efficient spectrum management schemes.

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The 5G heterogeneous networks will mainly consist of network densification, i.e., densification over space and frequency. The dense deployment of small cells is called the densification over space whereas utilizing radio spectrum in diverse bands is called densification over frequency. Network densification can meet the demand of high capacity in 5G networks. However, opportunistic spectrum sharing is important in order to achieve stringent goals of 5G in heterogeneous environment. Spectrum sharing ensures the coverage of 5G heterogeneous networks everywhere and all the time. It can support a large number connected devices and diverse applications. In addition, it is spectrum efficient as it can use all non-contiguous spectrum, can achieve The last decade has seen the dramatic increase in the demand of mobile data due to the increase in mobile devices versatile applications. It is forecast that the better system capacity, reduce energy consumption, and increase cell throughput. Dynamic spectrum access (DSA) has emerged as key for spectrum sharing in an opportunistic way signal. A radio network employing DSA to coexist with a licensed network (primary network) is known as a cognitive radio network (CRN) .

2.PROBLEM FORMULATION

We consider a 5G heterogeneous network which is composed of N primary networks, where each primary network can have any number of subscribed users (PUs). Each primary network has maximum number of channels denoted by pm, however, the number of channels available for SU communication depends on the PU spectrum. For consider a 5G heterogeneous network which is composed of N primary networks, where each primary network can have any number of subscribed users (PUs). Each primary network has maximum number of channels denoted by pm, however, the number of channels available for SU communication depends on the PU behavior. For each Spectrum sharing ensures the coverage of 5G heterogeneous networks everywhere and all the time channel condition in network m. The sharing ensures the coverage of 5G heterogeneous networks.

The energy consumption, and increase cell throughput. Dynamic spectrum access (DSA) has emerged as key for spectrum sharing in an opportunistic way . A radio network employing DSA to coexist with a licensed network (primary network) is known as a cognitive radio network (CRN) .The optimization problem is formulated to minimize the price incurred by the SUs and solved using the particle swarm optimization (PSO).An operated by a wireless service provider which leases a licensed spectrum band.

The possible rate of accounting mechanism. When j^{th} SU enters the system, it specifies its minimum data rate requirement and the maximum price j^{th}at it is willing to pay to the CNO. Let U = fu1; u2; :::; uM denote the set of M SUs contending for access Therefore, it is required to study network selection problem in order to enhance the previous work. The concept of SDN is used to propose a pre- estimation technique. Thus, the objective function for the optimization is

The 5G heterogeneous networks. The algorithm includes several features, such as associating a particle position into the different primary networks and channels computing fitness value of a particle. Another process, called mutation is performed. Mutation is applied to the child the Chromosomes, altering a binary bit of 0 to1.

The genetic algorithm (GA) and the PSO are the derived from natural phenomena and are commonly used for solving the optimization the problem.They belong to the class of evolutionary in evolutionary biology,such as a inheritance and mutation, selection and crossover. The PSO relies on the social behavior of the particles. In every generation, each particle adjusts its data on a based on its own best position and the positions of the best particle in the entire a population .

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Therefore, it is required to study network selection problem in order to enhance the previous work.

3.CONTRIBUTION

The concept of SDN is used to proper data. Thus the objective function for the optimization is expressed in The algorithmic flow of PSO technique starts. Each particle is initialized previous velocities personal best position, and its neighbor's best ,The position on the new velocity, respectively.

$$\text{Minimize : } Q(x) = \sum_{j=1} \sum_{m=1}^{M=1} (h\text{jm} + fjm)\,(x\text{jm})$$

Chromosomes are the basic building blocks of available the GA. Each chromosome should be represented in such a way that it provides complete information about the find solution of problem. A chromosome consists of genes that can be represented in the form of a binary or integer string

At any given time the each primary network has a different number of channels available for the SUs and each a Channel has a different each network has some constraints in terms of interference ,subscription fees and Capacity SU specify their requirements in terms of the minimum data rate and the maximum subscription fee that. They are willing to pay .Based on SU requirements and primary network constraints.

where Q(X) is the objective function that accumulates the incurred to PUs in the system and the amount that SUs have to pay for using primary networks. The first constraint states that each SU can be assigned only one channel among all the channels in networks at a given instant. If the binary decision variable is 1, the user is assigned to $m^{th}$the network and vice versa. Second, third and fourth constraints depend on the primary network resources available for SUs as well as the policy of the network. Second constraint ensures that the total interference caused by all SUs assigned to a particular network m will not exceed the maximum tolerable interference m.

4.PARTICLE SWARM OPTIMIZATION (PSO)

PSO consists of a swarm of particles in which each particle resides at a position in the search . The position of each particle is represented by a vector that presents a solution. The algorithmic flow of PSO technique starts with an initial population of n random particles. Each particle is initialized in previous velocities personal position, and its neighbor's best position on the very better (QOS) new velocity, respectively. The 5G heterogeneous networks. The algorithm includes several features, such as associating a particle position into the different primary networks and channels computing fitness value of a particle.

1: Randomly initialize the position $x$kand velocity vk of each k^{th} particle

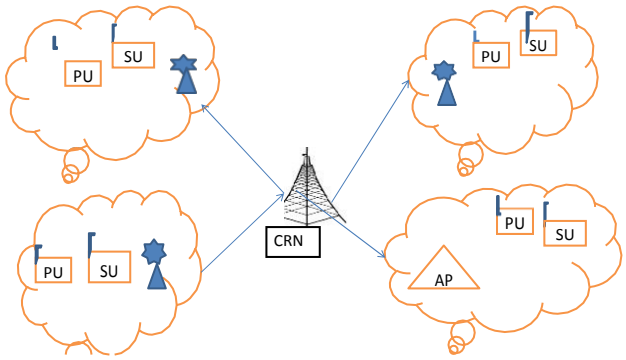
2: Calculate the fitness of k^{th}

3:p$best$k fork^{th} particle swarm

4: Calculate n$best$of at the particle

5: Update the velocity of vk k^{th} particle using (2)

6: Update the position of xkk^{th}particle using (3)



with a random position and velocity in the search space. PSO is an evolutionary algorithm, so the position and velocity of each particle is updated in every iteration. After the update, the fitness value of each particle is computed using a fitness function.

Where w is the inertial weight and c1 and c2 are the acceleration constants of the particles. w, , and c2 represent the influence of their own by individual particle experience and global experience. The general description of PSO is given in Algorithm

The algorithm starts to randomly generate as many potential solutions for the problem as the size of the initial population of the PSO. Each dimension in the particle vector represents a channel as well as a network assigned to a SU. The allocation of a network and a channel to SUs is performed sequentially until all SUs are assigned to a network and channels

The next stage is to use the proposed algorithm to adjust the position of the particles. This algorithm starts at the beginning of the first dimension and works through to the end of the particle Normally GA starts by creating an initial population of chromosomes denoted by Npop. Each chromosome encodes a solution of the problem, and its fitness value is related to the value of the objective function for that solution. Generic operations, such as crossover, mutation, and natural selection

A. Encoding of Particles

One of the key problems in applying PSO is the definition of an encoding scheme that describes one-to-one mapping between the solution and the particle. Each particle should consist of a complete solution for SUs, primary networks, and channels The general description of PSO is given in Algorithm.

C. Fitness Measure

The next step after construction of the chromosomes and generation of the initial population is to evaluate each chromosome by measuring its fitness. The fitness measure is also known as the survival measure that determines how well an individual from a population solves the given problem.

D. Mutation:

Another process, called mutation is performed. Mutation is applied to the child chromosomes, altering a binary bit of 0 to 1 or vice versa.

4.Result Analysis:

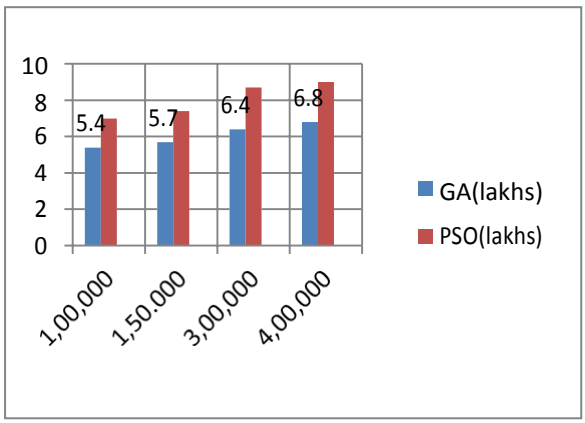


Fig 1) Probability of PU Vs Average Cumulative Cost

B. Encoding of Chromosomes

Chromosomes are the basic building blocks of the GA. Each chromosome should be represented in such a way that it provides complete information about the solution of problem. A chromosome consists of genes that can be represented in the form of a binary or integer string

E. Selection of Chromosomes

The process following the fitness measure is the construction of the next generation selection. The selection process is dependent on the fitness measure of the chromosomes. In the selection process, the population is first sorted by a comparison of fitness values. The top N pop R select chromosomes are included in the selected/mating pool.

5.Related Work:

A media independent handover and software-defined network (SDN)-based framework for network selection in 5G heterogeneous network is proposed in [18]. The concept of SDN is used to propose a pre-selection mechanism and two-dimensional cost function in order to reduce the network selection latency. An effective network selection algorithm for 5G heterogeneous networks is proposed that can efficiently choose the network with guaranteed data rate and user performance. The network is selected based on a parameter which considers various metrics associated with users, system, base station transmitted power, traffic load, and spectral efficiency. In considered realistic approaches based on network centric and user-centric for intelligent network selection.

However, none of them considered price based network selection approach. The aim is to select a band with highest secondary channel power gain and lowest interference channel power gain to PUs. Authors formulated a problem to maximize effective capacity by optimizing transmit power allocation with both band selection criteria.

TABLE 1: Iteration Vs object value

Iteration Value	Scenario 1		Scenario 1	
	GA	PSO	GA	PSO
100	1.6200	1.4440	1.6450	1.6000
200	1.6600	1.4500	1.6650	1.6070
500	1.7700	1.4700	1.6900	1.6150
1000	1.7800	1.5000	1.7000	1.6300
1600	1.7960	1.5100	1.7050	1.6400
2000	1.8000	1.5200	1.7090	1.6550

Simulation result

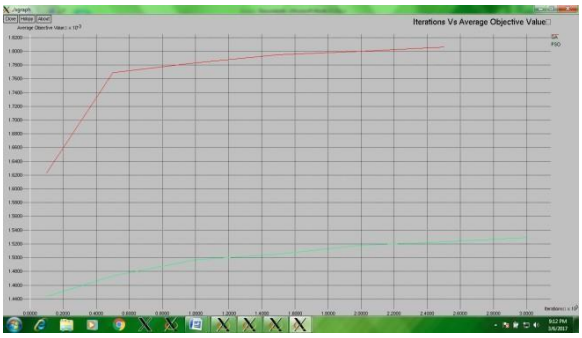


Fig 2) Iteration Vs object Value.

6.CONCULSION

The emerging wireless applications with stringent QOS requirements continue to demand more spectrum resources Spectrum sharing is the key solution to deal with the problem of spectrum scarcity. In this paper, we have studied the network selection problem in 5G heterogeneous networks. We have proposed a network selection mechanism and formulated an optimization problem for network selection to minimize the interference to primary networks and cost paid by SUs. We then solved the optimization problem with the PSO and modified GA in order to find near-optimal solution. We have also designed two scenarios for performance evaluation with different system settings, SU data rate demands, and price preferences. Then the performance of proposed mechanism for network selection was evaluated under these scenarios. The simulation results showed that the modified GA outperforms the PSO and achieves a higher fitness value with less iterations in terms of both interference reduction and SU price requirement.

7.REFRENCE

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