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Modeling and Optimization of Miso Using Power Consumption

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Abstract: Now a day the technology has dramatic growth although in some rural area. These some lack for signal service providers to overcome. In this paper proposed join beam forming using SA (Sampling Annealing) functions at layer providers. A server and Client are in same location at different providers. The server has signal means will given signal to client. Belongs to delay at traffic consumed should power allocation. That provider accessed service Layers. The model has been validated with experimental results, performed by using Primary and Secondary side loaded by real-world traffic traces. The achieved results demonstrate how the proposed model can effectively represent energy- and network-aware performance indexes. On this basis, we propose a constrained optimization policy, which seeks the best tradeoff between power consumption and packet latency times. The proper spectrum management, mobile networks are able to provide their subscribers a variety of services with different QoS levels of the BSs of mobile networks are usually sparsely deployed. If the power consumption of the PBS is reduced

Keywords: Sampling Anneling, Coginative Network, Primary Base station, Secondary Base station

I. INTRODUCTION

COGNITIVE radio (CR), as a promising technology to enhancing the utilization efficiency of the scarce radio spectrum, has attracted tremendous interests recently. A key feature of the CR network is to allow a secondary user (SU) to simultaneously share a licensed spectrum as long as the secondary transmission does not interfere with the primary link. As a result, the challenge of the CR network is to protect the primary users (PUs) from harmful interference induced by the SUs as well as to meet the quality of service (QoS) demands of SUs [1].

Cognitive beamforming and power control, as an effective interference suppression technology, has been widely used in CR from different aspects [2-4]. All these work are based on the assumption of perfect channel knowlege. However, in practical systems, perfect CSI is difficult to obtain due to the loose cooperation between PUs and SUs, as well as many other factors such as inaccurate channel estimation, limited feedback or lack of channel reciprocity. The worst-case approach has been used to design robust power for SUs in a multiple-input single-output (MISO) CR system [5, 6]. In [5], the software assisted method and a geometric method were considered for single SU and single PU to find suboptimal solution for the certainty and uncertainty models. A bounded region for channel matrices and channel covariance matrices was assumed to be known in [6]. The authors used a type of ellipsoid uncertainty problem to express the bound channel uncertainty.

For more SUs or PUs, [7] made some approximations for the uncertainty channel model between SUs and PUs. In [8], the worst-case of uncertainty was considered and the initially non-convex uncertainty problems are transformed into a second order cone programming (SOCP) or other convex problems, which can be solved by software. In [9], a linear precoder design scheme based on the minimum mean square error (MMSE) criteria for a CR multi-input multi-output (MIMO) system was presented. The proposed scheme, with the consideration of both cooperative feedback from PUs and local feedback from SUs to the secondary base station (SBS), is robust to the channel uncertainties. Robust distributed power allocation algorithm for underlay CR networks was proposed in [10], which maximizes the sum utility of SUs when channel gains from SUs to primary base station (PBS) and interference introduced by PUs to the SBS are uncertain. In [11], the authors studied the problem of joint beamforming and power allocation in a cognitive MIMO system using game theory, where the imperfect CSI was taken into account by the robust interference constraint and the optimization problem in the formulated robust game is converted into a SOCP problem.

Inspired by the aforementioned work, in this paper, we consider the problem of joint beamforming and power control for underlay CR via game theory under imperfect CSI, where multiple SUs coexisting with multiple PUs. The objective is to maximize the sum utility of SUs under the interference power constraints at PUs, the total transmission power constraint of SUs, and SINR constraint

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of each SU. The joint problem is formulated as non-cooperative game, and then an ellipsoid model is adopted to describe the CSI uncertainty. By taking some approximation, the problem is reformulated as a SOCP problem. Simulation results show that the effectiveness of our proposed scheme.

The reminder of this paper is organized as follows. In section II, the system mode of CR is introduced and the optimization problem under imperfect CSI is formulated. In section III, the problem of joint beamforming and power control is formulated as non-cooperative game, and then the problem is transformed into a SOCP problem. In Section IV, numerical results are shown for our scheme. Finally, Section V draws some concluding remarks.

II. PROBLEM STATEMENT

Under the assumption of imperfect CSI between the SBS and PUs, in order to enable the SUs to share the spectrum with PUs, we should find appropriate power level and beamforming vectors to distribute them among the SUs so that the sum utility of SUs is maximized and the interference created to PUs is as low as possible. In this section, the problem of joint beamforming and power allocation under imperfect CSI will be described from the perspective of game theory.

III. OVERVIEW OF BEAMFORMING

The evolution of multiple antenna systems has led to some important signal processing techniques such as beamforming [16] to substantially improve the performance of the wireless system. Beamforming exploits the benefits of antenna arrays for directional transmission or reception of a signal, which can be implemented at both receiver and transmitter. Specifically, interference reduction and SINR maximization are some of the key benefits that can be achieved with beamforming [46]. In literature, we can find two main categories of beamforming techniques [47]. They are called fixed beamforming and adaptive beamforming.

A. Fixed beamforming

Fixed beamforming uses a predefined set of beamforming weights and time-delays for each antenna at the transmitter or receiver. The beamforming weights and time-delays are basically calculated while exploiting the location and direction of the desired user. However, there is no correlation between the beamforming weights and the received signal in fixed beamforming. Hence, it can be identified as a multiple fixed beam switching technique.

B. Adaptive beamforming

Unlike fixed beamforming, adaptive beamforming technique dynamically computes the beamforming weights based on the properties (i.e., phase, amplitude fading) of the received signal. In other words, this technique tries to determine the optimal beamforming weights in such a way that they increase the quality of the desired received signal and minimize the interference to the other users. For instance, the least mean square algorithm [1], recursive least square algorithm [48] and sample matrix inversion [49] are some of the commonly used adaptive beamforming algorithms in literature.

C. Beamforming in Cognitive Radio Networks

We already mentioned that there are three dynamic spectrum access models, which are available to the SUs to initiate their communications. However, each dynamic spectrum access model introduces some amount of interference to the PU. Hence, the interference to the PU is inevitable in CRNs and sometimes it can be unintentional. Basically, interweave and overlay dynamic spectrum access models try to minimize the effect up to some extent by employing spectrum sensing and PU-association, respectively. In these kind of situations, SU's resources such as time and power are wasted and hence performance degradation in throughput is also possible. In addition to that, co-channel interference in wireless networks is another drawback due to the reusing of spectrum among the SUs.

In order to overcome those challenges, beamforming technique with multiple antenna system was introduced in CRNs [17]. For example, in hierarchical cellular network, using multiple antennas, SBS performs transmit beamforming to send multiple beams towards different SUs, which are located at various geographical locations. In such way, the energy of the transmitted signals is more concentrated at the intended receivers. As a result interference to the PU and other co-channel SUs are reduced.

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Furthermore, cooperative beamforming [50] is another type of beamforming method where a particular SU transmitter (i.e., source) uses some SU-relay nodes to send information to a particular SU receiver (i.e., destination). In this case, all users are equipped with single antenna transceivers. However, the SU-relay nodes act as a virtual array of antennas to focus the signal towards the intended SU-destination. Thus, it shows that even without implementation of multiple antennas at each SU, beamforming can be used to mitigate the interference and increase the received signal strength. However, association of the SUs could introduce significant complexity for beamforming in such system configuration. Related Works on Beamforming and Resources Allocation in CRNs.

IV. EXPERIMENT

A. Efficient bandwidth cooperative networks Communications

The wireless channel working as a shared medium makes available bandwidth per node even lower. So routing protocols should be bandwidth-efficient by expending a minimal overhead for computing routes so that much of the remaining bandwidth is available for the actual data communication. Third, nodes run on batteries which have limited energy supply. In order for nodes to stay and communicate for longer periods, it is desirable that a routing protocol be energy-efficient as well.

Thus, routing protocols must meet the conflicting goals of dynamic adaptation and low overhead to deliver good overall performance.

The routing protocols should also support for the reliable data delivery even though the links between the nodes are dynamically changing.

It may exhaust its energy and die. The dying of any sensor node can influence the topography. So the nodes that are going to die need to inform others. The process is also divided into time slots. In each time slot, the nodes whose energy is going to be exhausted will compute a random delay which makes only one node broadcast in this time slot. When the delay is ended, these nodes are trying to broadcast a packet to the whole network.

B. User-BS Allocations in Power and Channel

The Primary Base Station is able to dynamically access the spectrum by leveraging cognitive radio techniques. The PBS has the exclusive access to the licensed band. If PU is not within the coverage area of SBS means However, owing to the wireless channel fading between the PBS and PUs, providing high data rates to the PUs, especially to those located at the cell edge, is both bandwidth and power consuming. Therefore, the EST scheme enables the PBS to reduce its power consumption by offloading some of the PUs to SBSs provides data services to PUs within their coverage area using the allocated bandwidth.

C. Transmit power-spectral density

In this module receiver mobile receive the data from the PU or SU through the mobile core network via PBS or SBS. Compare with PBS the data receive through SBS means achieves at least 50% power consumption savings. The corresponding data is also viewed through this receiver Module.

D. Communications Model

The EST scheme enables the PBS to reduce its power consumption by offloading some of the PUs to SBSs, and allows the SBSs to enhance their QoS to SUs by utilizing the licensed bandwidth. Since SBSs usually have a low transmit power, the power consumption and the spectrum usages of mobile networks in providing data services to PUs is reduced. Thus, the EST scheme enhances both the energy efficiency and the spectral efficiency of networks.

E. Power Consumption

There are two types of users (senders): primary users (PUs) and secondary users (SUs). PUs are subscribers of the mobile networks while SUs are subscribers of ISPs. Different SUs may subscribe to different ISPs. Both users can either use the PBS or SBS to forward the data to the mobile core network. If the power consumption of the PBS is reduced, the PU is associated with SBSs; otherwise, the PU is associated with the PBS. As compared with the brute-force search, the genetic algorithm achieves at least 50% power consumption savings when the PBS experiences heavy traffic load from cell edge users.

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V. ARCHITECTURE DIAGRAM

VI. RELATED WORK

Enhance SINR at each secondary user receiver (SU-RX) by exploiting the advantages of multiple antenna systems. In literature, joint beamforming and resources allocation have been widely studied for multiple-antenna CRNs. It considered a sum-rate maximization problem with beamforming in a single PU channel CRN. In this work, the mutual interference between the SUs are nullified by deploying zero-forcing beamforming (ZFBF). ZFBF avoids the potential interference tolerance capabilities at SUs, the overall achievable sum-rate of the secondary network is degraded. Explained that each SU or PU receiver is capable of tolerating some amount of interference, and they further proposed that underlay communication allows SUs to co-exist with PUs as long as the interference to the PU-RX is below the predefined threshold.

VI. EXISTING SYSTEM

In existing we face the problem is sharing the speed robustness is not possible in cloud network by using the limited bandwidth and hard drive throughput. This problem is occur because the absence of physical remoteness. The absence of physical remoteness leads to the performance vulnerability. For this reason it's suffer more so they can't share the resources for the more people only for the limited people.

VII. PROPOSED SYSTEM

To overcome this problem using swiper a framework it can easily share the speed. In the swiper frame work it mainly concentrate on the three process co-location, synchronization and exploiting.co-location place the adversary SERVER on the same physical machine as the victim SERVER synchronization identify whether the targeted application is running on the victim and, if so, the state of execution for the targeted exploiting design an adversarial workload according to the state of the victim application, and launch the workload to delay the victim.

IX. CONCLUSION

In this paper, the problem of joint beamforming and power control in underlay CR with multiple PUs and multiple SUs was studied. Imperfect CSI between the SBS and PUs was considered. The problem was formulated as non-cooperative game, and then an ellipsoid model was adopted to describe the CSI uncertainty. After making some approximations, the problem was reformulated as a SOCP problem. Simulation results shown that the proposed scheme converges to an equilibrium state. And the sum utilities of SUs were also presented to illustrate the performance of the secondary network under perfect and imperfect CSI. Furthermore, we assumed that each SU-TX/SU-RX pair is only allowed to utilize at most one PU channel at a time. However, we may allow each SU-TX to use more than one channel to communicate with a single SU-RX. Hence, this could help to significantly improve the performance of the secondary network in term of achievable throughput while simultaneously satisfying the quality-of-service (QoS) requirement of each user. In addition, we can improve the spectrum utilization of both primary and secondary

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networks with greater extend.

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