



## Publications Template

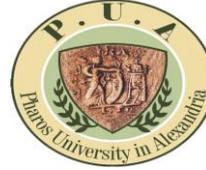
#	Research Title	Field	Abstract	Year of Publication	Publishing Link "URL"
1	Performance Analysis in the Presence of Channel Failure in Cognitive Radio Networks with Dynamic Spectrum Reservation	Communication Engineering	<p>In wireless networks, there are two prominent challenges. The first challenge is ensuring that users have opportunities to access channels and request new services. The second challenge is maintaining connections for data flows. These challenges are compounded by the occurrence of channel failures, which often occur due to characteristics of radio transmission such as signal attenuation, signal blockage or device and power outages. Channel failures can significantly impact the effectiveness of both the primary and secondary networks. Therefore, it becomes crucial to prioritize retainability which denotes the need to maintain uninterrupted user connections even during network disruptions. This paper proposes an analytical model that evaluates performance of cognitive radio networks in the context of random channel failure rates. Additionally, the dynamic channel reservation (DCR) scheme is introduced. It can be integrated into dynamic spectrum access (DSA) strategies. This integration aims to give priority to existing services over requests from users to provide cognitive networks with more opportunities to allocate idle channels or maintain their</p>	2024	<a href="https://ieeexplore.ieee.org/abstract/document/10453578">https://ieeexplore.ieee.org/abstract/document/10453578</a>



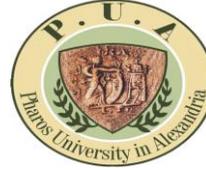
			<p>current services. Moreover, the cost functions for both the primary user (PU) and the secondary user (SU) are calculated. This calculation considers the failure rate specifically in either reserved channels (RCN) or non-reserved channels (N-RCN) to meet different performance requirements. The results show a decrease in the SUs cost function, which guarantees that the quality of service (QoS) requirements for the PU are fulfilled. Importantly, this reduction in SU cost leads to an enhancement in SU channel availability or throughput when compared to previous models.</p>		
2	<p>Centralized Dynamic Channel Reservation Mechanism via SDN for CR Networks Spectrum Allocation</p>	<p>Communication Engineering</p>	<p>In cognitive radio networks (CRNs), secondary users (SUs) transmission requests are fulfilled via the use of portions of the licensed bandwidth dedicated to primary users (PUs). Meanwhile, through spectrum sharing of dynamic spectrum access (DSA), the PUs gain either cooperative communications. Due to the fact that the spectrum bandwidth resources are restricted hence; the dynamic allocation requests have become the focus of attention in recent years. Therefore, the dynamic channel reservation (DCR) in CRNs has a significant influence on improving network performance via the adjustment of the optimal number of reserved channels. Also, the centralized control (central controller) with a software network (SDN) can be employed effectively to manage configuration, simplify the complexities, and develop dynamic coordination between the users in the network. In this paper, two algorithms of DCR</p>	<p>2020</p>	<p><a href="https://ieeexplore.ieee.org/abstract/document/9234388/">https://ieeexplore.ieee.org/abstract/document/9234388/</a></p>



		<p>are investigated to determine the optimal number of reserved channels based on SU retainability or SU channel availability while taking into consideration PU's channel availability minimum limit in both cases. Performance metrics in both cases indicate the enhancement in system quality of service (QoS). Moreover, the results show a significant reduction in SU cost function and network unserviceable probability (<math>Q_s</math>), while meeting the QoS requirements of PU through a minor inconsiderable impact on its channel availability and throughput compared to other previous models. In this paper, a proposed DCR algorithm is designed for selecting one of the two modes of operation depending on the incoming traffic requests to attain better performance characteristics.</p>			
3	<p>Performance Enhancement of Dynamic Spectrum Access via Channel Reservation for Cognitive Radio Networks</p>	<p>Communication Engineering</p>	<p>In cognitive radio networks models, quality of service (QoS) of primary users (PUs) must be assured. Dynamic spectrum access is a paradigm by which a radio system adjusts dynamically the use of convenient spectrum holes. In this paper, a secondary user reserved channel (SU-RC) model is proposed. SU-RC model introduces the use of a new SU reserved channel infrastructure to enhance QoS of SUs. Furthermore, SU-RC improves the efficiency of network by reducing the blocking probability and the forced termination probability of SUs. The proposed algorithm is significantly adaptable by deducing the optimal</p>	<p>2021</p>	<p><a href="https://link.springer.com/article/10.1007/s11277-021-08159-y">https://link.springer.com/article/10.1007/s11277-021-08159-y</a></p>



			<p>number of reservation channels. A reasonable balance between the success probability of channel selection and average number of channel switching is accomplished. Furthermore, this algorithm demonstrates the impact of PU' s interference either behind or inside influenced region on SUs. Simulation results show that, by applying the SU-RC algorithm with a preferable number of reservation channels, the number of channel switching is still very close to that of the network without external SU-reserved channel. For example, for the case if SU is inside the PU' s influenced region, when <math>p = 20</math> , <math>P_f = 0.05</math> has constant the optimal number of reservation channels <math>n_{opt} = 2</math> for both cases either with or without the existence of reserved channel. Furthermore, since <math>p = 10</math> , <math>P_m = 0.05</math> , the average number of channel switching <math>S(t)</math> is equal to 1.005 in case of without existence of the external reserved channel whereas <math>S(t)</math> is approximate 1.0275 which is regarded an in considerable increase of <math>S(t)</math> is about 0.0225.</p>		
4	Performance analysis of centralized dynamic spectrum access via channel	Communication Engineering	<p>The two main goals in wireless networks are to provide channel allocation opportunities for incoming services and to assure the accomplishment of ongoing services. In this paper, a channel reservation scheme in cooperative cognitive radio networks (CRNs) based on dynamic spectrum</p>	2020	<p><a href="https://www.sciencedirect.com/science/article/pii/S1110016820306001">https://www.sciencedirect.com/science/article/pii/S1110016820306001</a></p>



<p>reservation mechanism in cognitive radio networks</p>		<p>access (DSA) is proposed. In this scheme, a centralized cognitive manager (CCM) provides the dynamic coordination access for primary users (PUs) and secondary users (SUs) through partitioning the spectrum into non-reserved channels (N-CRN) and reserved channels (R-CRN). N-CRN can be exploited by licensed PUs and unlicensed SUs, while R-CRN is dedicated for active SUs until the successful completion of their service. If a SU session in N-CRN is interrupted by the sudden arrival of PU, then a spectrum handover occurs to R-CRN to resume its session. The reserved channel number R is deduced upon the reduction of both forced termination and blocking probabilities for SUs while satisfying PUs' traffic demands. Also, overall system cost and SU cost functions are investigated. Simulation results show significant reduction in blocking and forced termination probabilities and improvement in utility function and service completion rate of SUs while meeting PU's quality of service (QoS) aims. For example, when the arrival traffic rates per channel <math>k_p \frac{1}{4} 0:5</math>, and for <math>R \frac{1}{4} 1, R \frac{1}{4} 2</math> and <math>R \frac{1}{4} 3</math>, the values of specific SU forced termination probabilities <math>P_{ft}</math> are 0.1597, 0.116, 0.0799 respectively compared to 0.2106 for the case of no channel reservation. Furthermore, blocking probability and service completion rate of PU are evaluated to demonstrate the effect of channel reservation variation on the system performance.</p>		
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5	<p>Performance enhancement of steady-state Markov analysis for cognitive radio networks via channel reservation</p>	<p>Communication Engineering</p>	<p>Cognitive radio wireless networks CRNs have been considered as an efficient communication paradigm to the utilization of scarce spectrum. The main purpose of channel reservation of dynamic spectrum access (DSA) is to access these idle channels intelligently which are specialized for primary users (PUS) to be used by unlicensed users temporarily, which are called secondary users (SUS) without causing critical interference to the licensed user's activity. In this paper, continuous-time Markov chain paradigm is improved via channel reservation to show the best usage of the radio spectrum bands, and the transition matrix are deduced for the proposed model. Moreover, the probability state vector is proved by performing steady state analysis. The deduced expressions of the suggested model are illustrated in the numerical results section.</p> <p>_ 2017 Faculty of Engineering, Alexandria University. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license</p>	<p>2017</p>	<p><a href="https://www.sciencedirect.com/science/article/pii/S1110016817302454">https://www.sciencedirect.com/science/article/pii/S1110016817302454</a></p>