International Journal of Research
Available at https://edupediapublications.org/journals
p-ISSN: 2348-6848
e-ISSN: 2348-795X
Volume 03 Issue 17
November 2016

Energy Efficient Allocation of Resources in OFDM Database Systems with Hybrid Energy Harvesting Station

[1]KANDULA ADI REDDY,[2] SAPTHAGIRI VIENALA,[3]B.BHARATHI

[1]PG Scholar, Department of ECE, SREE DATTHA GROUP OF INSTITUTIONS, Hyderabad.

[2] ASSISTANT PROFESSOR, Department of ECE, SREE DATTHA GROUP OF INSTITUTIONS, Hyderabad.

[3] ASSISTANT PROFESSOR, Department of ECE, SREE DATTHA GROUP OF INSTITUTIONS, Hyderabad

ABSTRACT:

The study of resource allocation algorithm is designed to connect to energy saving orthogonal frequency Access Network Division (OFDMA) downlink multiple Base Station with a hybrid energy harvesting (BS). Specifically, energy production and a constant source of energy driven by non-renewable resources It is used to provide the energy needed to operate the system. Consider first the unavoidable offline System configuration. In particular, assuming the availability of knowledge is causal for arrivals energy and channel Earnings, and the problem formulation and resource allocation now as a convex optimization problem is the limited range Horizon, taking into account the power consumption circuits, the energy storage capacity is limited, and minimum The required data. Make this the convex optimization problem is to find the optimal solution for convex Time application sharing and exploitation of the characteristics of nonlinear programming leading to fractures Asymptotically optimal resource allocation algorithm Iterative efficiency out of line for a large enough number to Subcarriers. In each iteration, the problem is solved transformed by double decomposition of Lagrange. The Get the resource allocation policy increases the efficiency of energy use is likely to transfer data (weighted Bit / Gul delivered to the receiver). Later, we focus on algorithm design online. and traditional stochastic dynamic programming approach is working to obtain the optimal allocation of resources on the Internet The algorithm, which involves prohibitive complexity. To achieve a balance between system performance The computational complexity, suggesting a low

complexity suboptimal iterative algorithm that is online Motivated by now algorithm. The simulation results show that the optimum level without the common line proposed resource allocation algorithm does not meet only a small number of iterations, but also achieves optimal closeto- The energy efficiency of the system by the use of state of the channel information and access only causal energy.

INTRODUCTION:

Orthogonal frequency division multiple access (OFDMA) is a multiple access system applicable to spectrally efficient communication systems because flexility in the allocation of resources and capacity Exploiting the diversity of multiple [1], [2]. Specifically, OFDMA tip the scales with the number of broadband channel subcontractors orthogonal narrow channels and movie data by multiple users in different Subcarriers. OFDMA in downlink system, and the maximum speed of the system can be achieved Choosing the best used on all subcontractors and adaptive transmission power in each sub-carriers using Fill the water. Moreover, the growing interest in high-speed services data, such as video Conferences and HD video online has led to increased demand for energy. East The trend has significant financial implications for service providers, due to the rising cost of speed Energy. Recently, it is driven by environmental concerns, and received a large green communications The interest of the industry and the academic world [3] - [6]. In fact, cellular networks consumed worldwide Almost 60 million kilowatt hours per year. In particular, 80% of electric power in cellular networks Consumed by the base stations (BSS), which produces more than one hundred million tons of carbon dioxide Per year [6]. It is expected that these double figures for the year 2020 if no further action. As a result, a large number of green / technologies methods suggested in the literature To achieve maximum energy efficiency (bits per joule) of wireless communication systems [7] - [10]. In [7] it has been derived as a closed solution for power allocation to achieve maximum efficiency of energy from Carrier and one of the points of the system to a point with an average minimum productivity requirements. In [8] - [10], We have studied the efficiency of energy use in a multi-user multi-cellular carrier systems for transmission and downlink communications. Specifically, in [8] - [10], a global maximum Fred The energy efficiency of different systems have been tested, and can be reached by corresponding resources allocation algorithms. Moreover, there has been recent research efforts to improve the system Energy efficiency by using multiple antennas [11] - [13]. In [11] and [12], and power charging algorithms It was designed to maximize energy efficiency in antenna systems with the same location and distribution, Respectively. In [13], researchers examined the efficiency of energy use in cellular networks with a large number Transfer antennas in OFDMA systems. Then [7] - [13] requires the availability of a perfect energy source So that a large amount of energy can be used continuously during system operations when necessary. In practice, BSS may not be connected to the electricity grid, especially in developing countries. Therefore, the The assumption of a constant power supply made in [7] - [13] too optimistic in this case. in spite of This BSS could possibly be powered by diesel [14] generators and diesel fuel inefficient energy Producers and high transport costs of diesel fuel are obstacles in order to provide wireless Services in remote [15] areas. In such cases, the energy obtained is particularly attractive from BSS can get energy from natural and renewable sources of energy, such as solar and wind power, and geothermal energy The heat, which drastically reduces the operating costs of service providers. As a result, wireless BSS networks with energy harvesting imagine not only be efficient in energy supply Service coverage all over the place, but also to be self-sufficient. The introduction of energy capture capabilities for the BSS poses many new challenges for interesting algorithm design resource allocation availability of energy generated is due to the time varying from renewable energy sources. In [16] and [17], better programming packages and power allocation algorithms He proposed to harvest energy systems in order to minimize the time the transfer is complete, Respectively. In [18] and [19], the book suggests that the sequence control time optimum power to maximize Productivity before the deadline with a single energy collector. However, these actions carried distress communications system from end to end and the results may not apply to For broadband systems several users. In [20] - [22] packages, different scheduling algorithms optimized He suggested that the added Gaussian noise (AWGN) channels broadcast blank for a group of pre-selected Users. However, it does not detract wireless communication channel only for AWGN but also deteriorated Several track before

p-ISSN: 2348-6848
e-ISSN: 2348-795X
Volume 03 Issue 17
November 2016

disappearing. In addition, it is generally done dynamically user to improve the system of choice Performance. Moreover, although the amount of renewable energy can be unlimited, intermittent nature of the power generated by natural energy source results in a very random way The availability of energy in the BS. For example, solar and wind energy and varying drastically With the passage of time as a result of the weather and climate. In other words, BS solely powered by energy Combine may not be able to maintain stable operation and ensure a certain quality of service (Quality of service). Therefore, the hybrid power, using various sources of system design energy capture Complementarily, is the best practice to provide the service without interruption [23], [24]. However, the results in the literature, for example, [7] - [22], is valid only for systems with a single energy The source does not apply to communications networks that use hybrid BSS energy capture. In this paper the above issues are addressed, and we focus on designing for resource allocation algorithm BSS hybrid power uptake

Channel Assignment It is straight forward to prove that the EE of the single user system is directly proportional to its channel gain. This suggests one should assign each sub-channel to the user with the largest gain on that sub-channel. However, this may leave some users with no sub-channels at all. On the other hand, froma fairness point of view, one might want to assign each user the sub-channel for which this user has the greatest channel gain. We take an approach that balances these two perspectives.

The Channel Assignment Protocol

1) Re-label the users in the descending order oftheir proportional rate demands.

2) While (there are sub-channels left to assign)

3) for each user

4) Assign the sub-channel in which it has the largest gain.

5) End for

6) for each user

7) Assign a sub-channel if that user happens to have the largest gain on that sub channel.

8) End for

9) End while

Power Allocation Having assigned the subchannels using the protocol given above, we set out to solve the optimization problem in (4). The objective function in (4) is not concave in the powers. However, since thenumerator is positive and concave, and the denominator is positive and affine, (4) is a concave fractional program that can be transformed into a concave program using a transformation proposed by Charnes and Cooper [8].

Convergence and Complexity We will use the well-known result that sorting an array of n elements takes, at worst, a time in the order of n log2 n. Our sub-channel assignment protocol starts by sorting the users according to their rate requirements, and then sorting each row and column of the channel matrix according to the gain. This would take a time in the order of N log2 N + NK log2 K + KN log2 N. In the worst case scenario, we will need K/N iterations of the outer loop to assign all sub-channels. This shows that the algorithm for the sub-channel assignment protocol will converge and the complexity is NK log2 K +(K +1)N log2 N +K/N. Since K >>N, this reduces to O(NK log2 K). The problem with the convergence of the algorithms in the literature usually comes from the power allocation part [6]. Our power allocation procedure only need to solve a single nonlinear equation, regardless of the number of users in the system. In other words, it has constant time complexity and there are extremely efficient solvers that accomplish this in few iterations [9]. Thus, the resource allocation algorithm converges and has complexity O(NK log2 K). It should be noted that the algorithm in [6] uses minimum rate constraints as opposed to our proportional rates, and that algorithm also has the same complexity as ours. The algorithm in [6] is based on bi-level optimization, uses an approximate estimate of the EE, and more importantly, the convergence of that algorithm is not proven.

CONCLUSION:

A two-step solution to the problem of finding the distribution of power and frequency Increases efficiency J bit / / Hz power based on OFDMA downlink And if the transfer of the base station with relative speed restrictions. The complexity of the proposed algorithm itself, which is the best algorithm In the literature for the same problem, but with minimal restrictions. While The algorithm is guaranteed to converge in the literature, the proposed algorithm This document proved to be convergent.

REFERENCES

[1] H. Zhu and J. Wang, "Chunk-Based Resource Allocation in OFDMA Systems – Part II: Joint Chunk, Power and Bit Allocation," IEEE Trans. Commun., vol. 60, pp. 499 –509, Feb. 2012.

[2] K. Seong, M. Mohseni, and J. Cioffi, "Optimal Resource Allocation for OFDMA Downlink Systems," in Proc. IEEE Intern. Sympos. on Inform. Theory, Jul. 2006, pp. 1394–1398.

[3] Y. Chen, S. Zhang, S. Xu, and G. Li, "Fundamental Trade-offs on Green Wireless Networks," IEEE Commun. Mag., vol. 49, pp. 30–37, Jun. 2011.

[4] C. Han, T. Harrold, S. Armour, I. Krikidis, S. Videv, P. Grant, H. Haas, J. Thompson, I. Ku, C.-X. Wang, T. A. Le, M. Nakhai, J. Zhang, and L. Hanzo, "Green Radio: Radio Techniques to Enable Energy-Efficient Wireless Networks," IEEE Commun. Mag., vol. 49, pp. 46–54, Jun. 2011

[5] H. Bogucka and A. Conti, "Degrees of Freedom for Energy Savings in Practical Adaptive Wireless Systems," IEEE Commun. Mag., vol. 49, pp. 38–45, Jun. 2011.

[6] G. P. Fettweis and E. Zimmermann, "ICT Energy Consumption - Trends and Challenges," in Proc. of the 11th International Symposium on Wireless Personal Multimedia Communications, Sep. 2008, pp. 1–5.

[7] C. Li, S. Song, J. Zhang, and K. Letaief, "Maximizing Energy Efficiency in Wireless Networks with a Minimum Average Throughput Requirement," in Proc. IEEE Wireless Commun. and Networking Conf., Apr. 2012, pp. 1130 –1134.

[8] G. Miao, N. Himayat, and G. Li, "Energy-Efficient Link Adaptation in Frequency-Selective Channels," IEEE Trans. Commun., vol. 58, pp. 545–554, Feb. 2010.

[9] G. Miao, N. Himayat, G. Li, and S. Talwar, "Low-Complexity Energy-Efficient Scheduling for Uplink OFDMA," IEEE Trans. Commun., vol. 60, pp. 112 –120, Jan. 2012.

[10] D. W. K. Ng, E. S. Lo, and R. Schober, "Energy-Efficient Resource Allocation in Multi-Cell OFDMA Systems with Limited Backhaul Capacity," IEEE Trans. Wireless Commun., vol. 11, pp. 3618 – 3631, Oct. 2012.