Adaptive Cell Tower Placement Approaches: A Survey

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ABSTRACT

The rising of number of cell phone users a usage of cell phones in remote straddles have commanded the web ability providers to rise their coverage and spread it to all places. Price of allocating a cell tower depends on the height and locale. possible tower locations have to be ambitious in each given area. And merely the best and most vital ones that are demanded to cover maximum clients in the span, have to be selected alongside alongside their corresponding optimal height. These features can aid the ability provider firms to set up their tower in a cost-efficient manner so that they can cover maximum clients in the span and in coil maximize their profit.

Keywords---- Cellular Networks, LTE Networks, Optimal tower locations, Optimizations

I. INTRODUCTION

Fig 1: Architecture of 4G cellular Networks and Relay

With the target of crafting a collaboration entity amid disparate telecommunications associations, the 3rd Creation Partnership Undertaking (3GPP) was instituted in 1998. It commenced working on the wireless, core web, and ability design of a globally applicable 3G knowledge specification. Even nevertheless 3G data rates were by now real in theory, early arrangements like Universal Mobile Telecommunications System (UMTS) did not instantly encounter the IMT-2000 necessities in their useful deployments. Hence, the standards demanded to be enhanced to encounter or even exceed them. The combination of Elevated Speed Downlink Packet Admission (HSDPA) and the consecutive supplement of an Enhanced Dedicated Channel, additionally recognized as Elevated Speed Uplink Packet Admission (HSUPA), managed to the progress of the knowledge denoted to as Elevated Speed Packet Admission (HSPA) or, extra casually, 3.5G.

4G is 4th mobile contact and knowledge in short. It is a technical product incorporating 3G and WLAN. It transmits elevated quality video and pictures, alongside the quality of pictures equivalent to high-resolution TV. The 4G arrangement downloads in a speed up to 100Mbps, 2000 periods faster than the ADSL, and uploads at a speed up to 20Mbps. It can encounter the necessities of nearly all users on the wireless service. As the worth is the most instant concerns of users, 4G is equivalent to the fixed broadband web, alongside extra flexible pricing system. The user can customize needed services subject to this demand. Additionally, 4G can be used in the spans that are not obscured by DSL and Cable TV Modem, and next be increased to the finished region. Obviously, 4G has incomparable gains.

II. RESEARCH CHALLENGES

The use of wider bandwidths, multiple spectrum bands, and spectrum sharing introduces new challenges in terms of transceiver, signal processing, resource management, and error control mechanism design, among others.

Transceiver design

The design of wideband transceivers will be affected by several factors such as the following.

- Frequency-dependent path loss: As higher frequencies are used, the path loss increases nonlinearly.
- Doppler frequency and spectrum: At higher frequencies, the Doppler effects affect the signals more severely, which would require
faster adaptation algorithms, increasing the overhead.

- Effective noise power: As the bandwidth increases, the effective noise increases as well.
- Receiver input signal: Using a wider bandwidth translates into receiving more undesired signals from other services (e.g. broadcast and radar signals). So, issues such as image rejection, reciprocal mixing have to be considered.
- Nonlinearities in analogue receiver components: Distortion and intermodulation create additional signals under overload conditions, which can affect the demodulation process.
- Reciprocal mixing: When undesired signals mix with the oscillator noise, additional noise is introduced into the receiver, resulting in an additional noise figure.
- Receiver performance: The performance of the receiver will be limited by all the previous listed elements.
- Maximum input signal: The receiver has to have a sufficient dynamic range to avoid overload conditions.
- Sampling frequency: Sampling the entire spectrum from the lowest to highest frequency would represent an extremely high sampling frequency.
- ADC dynamic range and output data rate: With the models described in a resolution of 21–24 bits is needed with dynamic range of 120–130 dB. Combining this requirement with the previous one translates into processing rates far beyond what is currently feasible. This also translates into high power consumption which could not be used in UE.
- Optimal Relay placement: allocating an additional cell tower (or a set of towers) to an existing cellular network, maximizing the call completion probability.

III. NETWORK PLANNING: HETEROGENEOUS NETWORK DEPLOYMENT

The exponential development in demand for higher data rates and supplementary services in wireless webs needs an extra dense placement of center stations inside web cells. Whereas standard macro-cellular web placements are less effectual, it could not be frugally feasible to adjust the present web architectures. Microcells are usually projected to furnish colossal coverage and are not effectual in bestowing elevated data rates. One seeming method to make the cellular webs extra manipulation effectual in order to uphold elevated speed data-traffic is by cutting the propagation distance amid nodes, hence cutting the transmission power. Therefore, cellular web placement resolutions established on tinier cells such as micro, pico and femtocells are extremely enthusing in this context. A normal heterogeneous web placement is shown in Fig. 4. A micro/picocell is a cell in a mobile phone web assisted by a low manipulation cellular BS that covers a tiny span alongside dense traffic such as a shopping mall, residential spans, a resort, or a train station. As a normal scope of a micro/picocell is in the order of insufficient hundred meters, femtocells are projected to assist far tinier spans such as confidential residences or indoor areas. The scope of femtocells is normally merely insufficient meters and they are usually wired to a confidential owners’ cable broadband connection or a residence digital subscriber line (DSL). Tinier cells because of their size are far extra manipulation effectual in bestowing broadband coverage. As an example, a normal femtocell could merely have a 100mW PA, and sketch 5W finished contrasted to a 5KW that should be demanded to prop macrocell. A scrutiny by OFCOM (UK regulator) and Plextek finished that femtocell placement might have a 7:1 operational power supremacy ratio above the development of the macro cell web to furnish concerning comparable indoor coverage. Simulations display that alongside merely 20% of clients alongside picocells, a combined placement of macro cell and picocell in a web can cut the power consumption of the web by up to 60% contrasted to a web alongside macro cells only. One more supremacy of tinier cells is that they can use higher frequency groups suitable to furnish elevated data rates and additionally proposal localization of wireless transmissions. Though, employing too countless tinier cells inside a macro cell could cut the finished efficiency of the macro cell BS, as it will have to work below low burden conditions. Therefore, prudent investigation of assorted placement strategies ought to be completed in order to find how to best use such tinier cells. Thinking layouts alongside disparate number of micro BSs in a cell, in supplement to macro locations, the authors familiarize the believed of span manipulation consumption as an arrangement presentation metric. Simulation aftermath counsel that below maximum traffic burden scenarios, the use of micro BSs has a rather reasonable result on the span manipulation consumption of a cellular web and powerfully depends on the offset manipulation consumption of both the macro and micro sites. In the authors examine the possible

Fig. 4. A typical heterogeneous network deployment
Improvements of the alike metric attainable in web layouts alongside disparate numbers of micro BSs jointly alongside macro locations for a given arrangement presentation targets below maximum burden conditions. As large-scale femtocell placement can consequence in momentous power consumption, an power saving procedure that permits femtocell BS to completely coil off its transmissions and processing after not encompassed in an alert call was counseled in. Reliant on the voice traffic ideal, this mechanism can furnish an average manipulation saving of 37.5% and for an elevated traffic scenario; it can accomplish five periods reduction in the occurrence of mobility events, contrasted to a fixed pilot transmission. A rather radial way to craft a link amid fully centralized (cellular) and decentralized (ad hoc) webs in order to accomplish extra effectual web placement is a paradigm shift towards self-organizing small-cell webs (SCNs). Though, coverage and presentation forecast, interference and mobility association jointly alongside protection subjects are a little of the countless subjects that have to be dealt as arranging such webs.

IV. TOWER PLACEMENT

Cooperative tower arrangement is an enthusing knowledge that can enhance the presentation of a wireless arrangement via a number of mechanisms, such as increased spatial diversity or beam forming effects. There is no mistrust that these mechanisms can rise the spectral efficiency and the finished throughput of the finished system. Though, employing such methods normally implies consenting higher manipulation consumption not merely of the transceiver but additionally of the finished wireless admission network. Therefore, relay methods that enhance the energy-efficiency are vital to the cellular webs, as they are not merely good for the nature but additionally make business sense for operators and prop sustainable, lucrative businesses. As the relays consume the arrangement resources and domination, the finished energy-efficiency of the tower arrangement methods could be limited. Therefore, one interesting subject in the tower arrangement is to ascertain whether a two-hop transmission is necessary. And it is additionally vital to select a relay amid obtainable candidates to maximize cooperation benefits for the user or for the finished arrangement Cell Towers being luxurious needs to be strategically allocated, to cut cost. Moreover, the optimal height of a tower being allocated demand to be sensibly computed as the height of the tower not merely affects the coverage of the tower but additionally affects the price of its placement. In this context, we come across assorted complications. For instance, signals flounder to grasp precise spans as scope of coverage gets distorted due to geographical constraints. Henceforth, possible tower locations have to be ambitious in each given area. And merely the best and most vital ones that are demanded to cover maximum clients in the span, have to be selected alongside alongside their corresponding optimal height. These features can aid the ability provider firms to set up their tower in a cost-efficient manner so that they can cover maximum clients in the span and in coil maximize their profit. This can aid in instituting effectual connectivity across the area.

The node arrangement setback in the context of telecommunications, implanted in the frank discover of ability locale and k-medial setback in procedures scrutiny, is one of the most vital subjects in web arranging and deployment. The arrangement setback has been extensively formulated to ascertain the locations of contact web equipments, such as BSs, RSs, admission point (APs), and gateways. It becomes an even extra complex task after the QoS, the price incurred by the web providers, and environmental results such as wireless smog, are jointly seized into consideration.

Early scrutiny on relay-enabled wireless webs was generally led in mobile ad hoc webs, whereas mobile nodes relay data to the peer acquaintance nodes. The early relay-based cellular wireless web was counseled in, that was a consequence of merging ad hoc webs and cellular networks. Relay nodes (RNs) were gave to onward data traffic from a congested cell to a less congested bordering cell in the Consolidated Cellular and Ad-Hoc Relay architecture. In wireless sensor webs, subject to manipulation constraint and necessity of web connectivity, RNs were retained for data aggregation and mixture to larger balance the power depletion and accomplish spread lifetime of the sensor nodes (SNs). In Wireless Native Expanse Webs (WLANs), expansion points and Tether less relay points were used to enhance the web throughput of a rectilinear web and an IEEE 802.11like WLAN nature below Rayleigh disappearing respectively. Vibrant burden balancing and/or arranging schemes were described in relay-based wireless networks.

The arrangement setbacks have been extensively tackled by devising into assorted mathematical models whichever in a discrete or constant space. In the discrete ideal, the design space is normally tear into rectangles (grids), and merely the centers of the rectangles can be allocated alongside a RS. The size of the grid has to be sufficiently tiny so as to attain satisfactory results. The TRP arrangement setback was formulated in a discrete space, and was resolved by a Lagrangian relaxation iterative algorithm. To cut admission latency in multi-hop wireless webs, Nuggehalli et al. Adopted a competent strategy alongside caching the server data at a little
distributed nodes, and counseled a polynomial period algorithm, that can applies to each arbitrary web topology and can be requested in a distributed and asynchronous manner. In the constant case, as no check is on the locale of arrangement, the established optimization algorithm (e.g., quasi-Newton method, manage find methods) can be retained to resolve the arrangement problem. In, to ascertain the the coverage, connectivity, price and lifetime of a Wireless Sensor Network, Wang et al. formulated the sensor arrangement into a minimum set obscuring setback and counseled a two-phase heuristic algorithm to resolve it in power manipulated scenario. In the earth of data theory, countless studies have concentrated on the design of obliging communication/relaying protocols, outage probability scrutiny, and signal error rate analysis. Cover and El Gamal derived the attainable rate for the Gaussian relay channel. The attainable rate formula and a coding scheme for the multiple-level relay channel were described in. The multihop relaying, alongside alongside even extra convoluted multisource multi-destination construction, was shown to considerably rise the finished web throughput.

V. RELATED WORK

Pinals, L. et al, in "Link Regime and Power Savings of Decode-Forward Relaying in Fading Channels" 2015 [1], the authors describe in this paper, they re-examine the relay channel under the decode-forward (DF) strategy. Contrary to the established belief that blocks Markov coding is always the rate-optimal DF strategy, under certain channel conditions (a link regime); independent signaling between the source and relay achieves the same transmission rate without requiring coherent channel phase information. Further, this independent signaling regime allows the relay to conserve power. As such, they design a composite DF relaying strategy that achieves the same rate as block Markov DF but with less required relay power. The finding is attractive from the link adaptation perspective to adapt relay coding and relay power according to the link state. They examine this link adaptation in fading under both perfect channel state information (CSI) and practical CSI, in which nodes have perfect receive and long-term transmit CSI, and derive the corresponding relay power savings in both cases. They also derive the outage probability of the composite relaying scheme which adapts the signaling to the link regime. Through simulation, they expose a novel trade-off for relay placement showing that the relay conserves the most power when closer to the destination but achieves the most rate gain when closer to the source.

Parzysz, F. et al, in "Impact of Propagation Environment on Energy-Efficient Relay Placement: Model and Performance Analysis" 2014 [2], the authors describe the performance of a relay-based cellular network is greatly affected by the relay location within a cell. Existing results for optimal relay placement do not reflect how the radio propagation environment and choice of the coding scheme can impact system performance. In this paper, they analyze the impact on relaying performance of node distances, relay height and line-of-sight conditions for both uplink and downlink transmissions, using several relay coding schemes. Their first objective is to propose a geometrical model for energy-efficient relay placement that requires only a small number of characteristic distances. Their second objective is to estimate the maximum cell coverage of a relay-aided cell given power constraints, and conversely, the averaged energy consumption given a cell radius. They show that the practical full decode-forward scheme performs close to the energy-optimized partial decode-forward scheme when the relay is ideally located. However, away from this optimum relay location, performance rapidly degrades and more advanced coding scheme, such as partial decode-forward, is needed to maintain good performance and allow more freedom in the relay placement. Finally, they define a trade-off between cell coverage and energy efficiency, and show that there exists a relay location for which increasing the cell coverage has a minimal impact on the average energy consumed per unit area.

Biao Han et al, in "Optimal relay node placement for multi-pair cooperative communication in wireless networks" 2013 [3], the authors describe Relaying and cooperation have emerged as important research topics in wireless communication over the past half-decade. During cooperative communication, spatial diversity can be achieved by exploiting the relaying capabilities of the involved relay nodes, which may vastly enhance the achieved system capacity. The potential gains largely depend on the location of relay nodes. In this paper, they study the relay node placement problem for multi-pair cooperative communication in wireless networks, where a finite number of candidate relay nodes can be placed to help the transmission of multiple source-destination pairs. Our objective is to maximize the system capacity. After formulating the relay node placement problem, they comprehensively study the effect of relay location on cooperative link capacity and show several attractive properties of the considered problem. As the main contribution, they develop a geographic aware relay node placement algorithm which optimally solves the relay node placement problem in polynomial time. The basic idea is to place a set of relay nodes to the optimum locations so as to maximize the system capacity. The efficiency of their proposed algorithm is evaluated by the results of series experimental studies.

Sung-Rae Cho et al, in "QoS Provisioning Relay Selection in Random Relay Networks" 2011 [4], the authors describe In this paper, they propose an analytical framework for determining the outage probability of random and best relay selection schemes given a Poisson field of relay nodes and the presence of path loss and fading. For relay selection, relays geographically close to the source and destination are preferred to others. This selection guideline ensures a target quality of service (QoS) and reduces the signaling overhead and the relay selection delay. A spatial region called the QoS region is obtained for the random relay selection and is shown to...
shrink as the distance between the source and the destination increases and the interfering node density increases. When the QoS region for random relay selection is not large enough and cannot probabilistically ensure a reliable relay therein, the best relay selection is employed since the required relay node density and selection range for a desired QoS can be reduced for the best relay selection. The gain of the best relay selection with respect to the random relay selection is quantified in terms of relay node density reduction and coverage extension due to selection diversity.

Jianhua Mo et al, in "Secure Beam forming for MIMO Two-Way Communications With an Untrusted Relay" 2014 [5], the authors describe This paper studies the secure beam forming design in a multiple-antenna three-node system where two source nodes exchange messages with the help of an untrusted relay node. The relay acts as both an essential signal forwarder and a potential eavesdropper. Both two-phase and three-phase two-way relay strategies are considered. Our goal is to jointly optimize the source and relay beam formers for maximizing the secrecy sum rate of the two-way communications. They first derive the optimal relay beam former structures. Then, iterative algorithms are proposed to find source and relay beam formers jointly based on alternating optimization. Furthermore, they conduct asymptotic analysis on the maximum secrecy sum-rate. Our analysis shows that when all transmit powers approach infinity, the two-phase two-way relay scheme achieves the maximum secrecy sum rate if the source beam formers are designed such that the received signals at the relay align in the same direction. This reveals an important advantage of signal alignment technique in against eavesdropping. It is also shown that if the source powers approach zero, the three-phase scheme performs the best while the two-phase scheme is even worse than direct transmission. Simulation results have verified the efficiency of the proposed secure beam forming algorithms as well as the analytical findings.

Xu, H. et al, in "Shared Relay Assignment (SRA) for Many-to-One Traffic in Cooperative Networks" 2015 [6], the authors describe Relay assignment significantly affects the performance of the cooperative communication, which is an emerging technology for the future mobile system. Previous studies in this area have mostly focused on assigning a dedicated relay to each source destination pair for one-to-one (121) traffic. However, many-to-one (M21) traffic, which is also common in many situations (for example, several users associate with one access point in a wireless access network such as a WLAN), hasn’t been well studied. This paper addresses the shared relay assignment (SRA) problem for M21 traffic. They formulate two new optimization problems: one is to maximize the minimum throughput among all the sources (hereafter called M21-SRA-MMT), and the other is to maximize the total throughput over all the sources while maintaining some degree of fairness (hereafter called M21-SRA-MTT). As the optimal solutions to the two problems are hard to find, they propose two approximation algorithms whose performance factors are 5.828 and 3, respectively, based on the rounding mechanism. Extensive simulation results show that their algorithms for M21-SRA-MMT can significantly improve the minimum throughput compared with existing algorithms, while their algorithm for M21-SRA-MTT can achieve the close-to-optimal performance.

Shahbazi, S. et al, in "On Placement of Passive Stationary Relay Points in Delay Tolerant Networking" 2011 [7], the authors describe Recently, there has been focus on augmenting Delay/Disruption Tolerant Networks (DTNs) with easily deployable stationary relay nodes making an unconnected infrastructure to facilitate the data delivery by increasing forwarding opportunities. Relay nodes are capable of downloading, storing, and forwarding the data messages from/to the mobile nodes. Placing the relay nodes is an important issue in DTNs as the performance of the network is dependent to their positions. Relay placement is an NP-hard problem hence it makes it a more complicated issue in DTNs. Existing works in the literature are based on simulation which are suffering from computational complexities dictated by simulation. Moreover, they are optimizing the relay placement only based on specific scenarios. In this paper, they propose a generic analytical model in order to evaluate the performance of DTNs in presence of relay nodes. Our model is dependent on the mobile nodes’ mobility pattern, and they consider the case when the mobile nodes move according to the random waypoint model. In order to use the proposed model for placing the relays efficiently, they utilize two heuristic approaches. The first approach is based on optimization of the network performance using simulated annealing and the second one relies on a greedy approach to find the best location for each relay one at a time. Our simulation results show that their approaches outperform the simulation based approaches in terms of data delivery performance.

Qimei Cui et al, in "Optimal Energy-Efficient Relay Deployment for the Bidirectional Relay Transmission Schemes" 2014 [8], the authors describe recently, the energy efficiency of a relay network has become a hot research topic in the wireless communication society. In this paper, they investigate the energy efficiency of three basic bidirectional relay transmission schemes [i.e., the four time-slot (4TS), three time-slot (3TS), and two time-slot (2TS) schemes] from the angle of relay deployment. Since a realistic power consumption model is very important in analyzing energy efficiency, and a power amplifier (PA) consumes up to 70% of the total power, they consider a realistic nonideal PA model. The derived closed-form expressions for the optimal relay deployment and the simulation results reveal the following important conclusions. First, it is possible to achieve the optimal energy efficiency and enlarge the cell coverage simultaneously in bad channel conditions, but it may be very challenging in good channel conditions. Second, under asymmetric traffic conditions, particularly when the downlink rate is larger than the uplink rate, all the aforementioned three schemes have almost the same optimal relay deployment, but the 2TS scheme has the highest energy efficiency when the
spectral efficiency is large. Third, the relay node should be deployed closer to the base station with the nonideal PA than that with the ideal PA, and the optimal energy efficiency with the nonideal PA is much higher than that with the ideal PA. Moreover, the impact of small-scale fading depends on the value of path loss. To overcome the small-scale fading, the relay network needs to consume more energy.

Liu, S. et al, in "On impact of relay placement for energy-efficient cooperative networks" 2014 [9], the authors describe this study considers communication from a source to a destination with the aid of a set of cooperative relaying nodes. Unlike previous studies in energy efficiency, the authors studied the effect of relay placements together with different relay-selection timing on the performance. The cooperative relaying schemes for a general relay placement and some specialized relay placements are characterized and analyzed by a Markov chain model. They derive the expressions for the throughput and the expected energy consumption for both proactive and reactive relay selection for different relay placements and densities. By using the analytical expressions, the authors find the optimal relay locations for different relay-selection schemes to achieve higher energy efficiency with the consideration of system throughput. The performance improvements offered by the authors proposed relay placement are demonstrated by numerical results. Moreover, the two new cooperative relaying schemes with selection combining for a certain relay placement are discussed. Their throughput and energy consumption are also derived and compared with the existing techniques.

Xian Li et al, in "Energy-efficient link selection scheme in a two-hop relay scenario with considering a mobile relay" 2015 [10], the authors describe recently researches show that significant energy saving can be achieved by introducing mobile relays into wireless sensor networks. However, due to the extra transceiver circuit energy and the mobility energy consumed by the mobile relay, it is not always better to pass data through the relay rather than to send it from source to destination directly. In this study, the authors study a novel link selection problem in a two-hop relay scenario where the relay has the ability to move. In this scenario, data from source can be passed through three kinds of links: the direct link, the initial relay link and the adjusted relay link. From the energy-saving perspective, the optimal moving direction, the position adjustment criterion and the optimal position of the mobile relay are firstly studied through mathematical analysis. Based on a comprehensive discussion of the energy performances of these three kinds of links, and energy-efficient link selection scheme is then presented. Both the amount of data to be sent and the distance between source and destination are shown to be closely related to the link selection scheme. Finally numerical simulations are carried out to verify the theoretical results.

VI. NEED FOR OPTIMIZATION

The technical optimization variables contain the following:
- High price of running the center station; the percentage that use utility manipulation supply can be optimized across constructing close to basis of domination, thought of renewable and green manipulation to curb sound and pollution.
- Use of rooftop tops; surveys expose that the use of rooftop tops for dense city spans alongside elevated development constructing to be extra helpful, these options might be exploited across larger holistic arranging and larger area enlightenment.
- Collocation agreement; the regulations administrating collocation demand to be enhanced for larger ability delivery.
- Intelligent planning; there is demand for a extra Intelligent arranging that ought to seize topographic features of terrain, interference of supplementary ability providers etc as variables needing negligible drive examination and manual examination of locations.

VII. PROBLEM FORMULATION

In the need to check the power consumption of cellular webs as maintaining ability quality and omnipresent admission, lofty is a flexible and frugal resolution to enhance presentation, remove coverage dead zones or alleviate traffic hot zones. Towering is an enthusiastic feature of upcoming cellular webs and is envisioned as portion of subsequent creation cellular networks. The scenarios envisioned by the two standards for 4g webs and LTE are the following:
(a) coverage extension: towers ought to rise user experience in indoor or permit connection in shadowed zones;
(b) cluster mobility: towers can aggregate the traffic connected to a cluster of users inside a train or a bus;
(c) Capacity boost: by employing low-cost tower stations, a cellular operator can density its web and rise its capacity.

Unlike tiny cells, tower stations are not related to the core web across a wire line backhaul connection but have to rely on wireless transmission to admission the center station. This proposals momentous groundwork price reduction and placement flexibility but, at the alike period, can aggravate the interference issue. Discovering optimized lofty jointly alongside interference reduction and choice of coding scheme opens new perspectives for effectual tower deployment we demand to tackle the setback of optimal tower arrangement for capacity rise in an 4g and LTE like cellular web.

VIII. CONCLUSION AND FUTURE WORK

In this paper early setback believed is tower arrangement for maximum expansion of the cell radius. Rise in cell radius helps cut groundwork price of
employing extra center stations to propel the quickly producing number of subscribers. The 4G services had only reached alongside in a little locations of India, so that it could seize period to grasp to supplementary states. One more main defect of this is that expansive group frequency spectrum, that is demanded for 4G, is lacking. One more reason for this is that it is a price bearing item exceptionally for dispatching data. If it ought to be consented amid all clients, firstly it ought to be obtainable at a lower rate, for that the rate of spectrum ought to be declined. We counsel consequently an optimized method for tower arrangement employing pursuing methodology. Tower stations (RSs) are normally utilized to enhance the gesture strength for the users close to the cell boundary. Though, transmission across a tower station needs two transmission periods, i.e., one is from the center station to the tower station and the supplementary is from tower station to mobile stations. Thus, tower could additionally cut arrangement capacity if two-phase transmission period is considered. As a consequence, whether or not data are sent by one-hop or two-hop transmission ought to be ambitious established on both gesture strength and throughput. In this work, we examine the optimal tower locale aiming to maximize arrangement capacity. We ponder a novel gesture strength-oriented tower selection law for ascertaining whether a hop transmission is necessary oriented. We will find that the gesture strength-oriented hop transmission could yield higher arrangement capacity we will additionally recognize the optimal tower locale that can accomplish the highest arrangement capacity.

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