بسم الله الرحمن الرحيم

الآية

قال تعالي:

{ إقر أ باسمِ ربِّكَ الَّذي خلَق (1) خلَقَ الإنسانَ من علَق (2) إقرأ وربُّكَ الأكرم (3) الَّذي علَّمَ بالقلَم (4) علَّم الإنسانَ ما لم يعلم(5)}

سورة العلق الأيات (1 إلى 5)

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ABSTRACT

One of the main issues in international mobile telecommunications (IMT) -Advanced systems is how to improve the local area services and spectrum efficiency**.** Device-to-device (D2D) communication underlay with cellular networks allows direct communication between mobile users. D2D is an attractive approach for dealing with local traffic in 4G cellular networks systems.

The purpose of this project is to reduce the interference for D2D communication underlay cellular network and to study the log distance model in different environment with greedy grouping algorithm and compare the results.

All results are provided with three different SINR requirements, such as 6dB, 9dB and 12dB for the greedy grouping algorithm. The simulation is applied to lengths 500m, 250m, 100m and 50m for 150 links and 50 links. For each group of links the indoor, free space, urban, sub urban areas are implemented, when links are very long, it has been hard to form a group of links which can operate simultaneously. As decreasing the link lengths progressively, more links have combined to the same group, moreover when the minimum distance requirement is very long or greater than the diameter of the cell then it cause severe interference to other nodes, this interference can be reduce by decreasing the links distance of D2D.

All simulation results of different areas are grouped by greedy algorithm and compared with each other; the results show that the log distance model is best in sub urban areas.

المستخلص

واحدة من القضايا الرئيسية في أنظمة الإتصالات الدولية المتنقلة هي كيفية تحسين الخدمات المحلية وكفاءة الطيف. طريقة إتصال جهاز بأخر بإستخدام الشبكة المحلية مع الشبكات الخليوية تسمح بالإتصال المباشر بين مستخدمي الهواتف النقالة ،و هي نهج جذاب لتعامل حركة الإتصالات المحلية مع الشبكات الخليوية في أنظمة الجيل الرابع.

الهدف من هذا المشروع هو تقليل التداخل بين إتصال جهاز بأخر في الشبكة المحلية ودراسة نموذج تسجيل المسافة في بيئات مختلفة مع خوارزمية جريدي للتجميع ومن ثم مقارنة النتائج.

نُفِذت كل نتائج المحاكاة بثلاث متطلبات مختلفة لنسبة الإشارة الي نسبة الضجيج متثملةً في 6 دسيبل و 9 دسيبل و 12 دسبيل مع خوارزمية جريدي للتجميع. طُبِقت المحاكاة على اطوال مختلفة للوصلات بين الأجهزة تمثل 500 متر، 250 متر، 100متر،50 متراً ل 150 وصلة و أخري ل 50 وصلة ، لكل من المساحة الحرة، الأماكن المغلقة، المناطق الحضرية والمناطق شبه الحضرية. وُجِدَ انه عندما تكون الوصلات بين الأجهزة طويلة جداً ، يصعب تشكليل مجموعات من هذه الوصلات لكي تتصل مع بعضها في وقت واحد وكلما قلَّ طول هذه الوصلات تدريجياً يزيد عدد الوصلات التي تشترك مع بعضها في نفس المجموعة ،إضافة الي ذالك عندما يكون الحد الادني المطلوب للمسافة بين الاجهزة طويل جداً او اكبر من قطر الخلية يحدث تداخل شديد للعقد او الأجهزة ويمكن الحد من هذا التداخل بتقليل طول الوصلات بين الأجهزة.

تمت مقارنة جميع نتائج المحاكاة للمناطق المختلفة بخوارزمية جريدي للتجميع ووُجد أن نموذج تسجيل المسافه هو الأفضل في المناطق شبه الحضرية.

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LIST OF ABBREVIATIONS

3GPP	Third Generation Partnership Project
ACI	Adjacent Channel Interference
ACPR	Adjacent Channel Power Ratio
ASA	Authorized Shared Access
BS	Base Station
BER	Bit Error Rate
CCI	Co-Channel Interference
CDMA	Code Division Multiple Access
CEI	Coexistence Interference
CSMA	Carrier Sense Multiple Access
CU	Cellular User
D2D	Device-to-Device
DFT	Discrete Fourier Transform
DIA	D2D Communication Assisted Interference Alignment
DL	Down Link
FCC	Federal Communications Commission
FDD	Frequency Division Duplex
FFR	Fractional Frequency Reuse
FFT	Fast Fourier Transform

GSM	Global System for Mobile communication
IMT	International Mobile Telecommunications
IP	Internet Protocol
ISA	Interference Suppression Area
ISI	Intersymbol Interference
LTE	Long Term Evolution
MAI	Multiple Access Interference
MIMO	Multiple Input Multiple Output
MUD	Multiuser Detection
MU-MIMO	Multiuser MIMO
NMT	Nordic Mobile Telephone
OFDM	Orthogonal Frequency Division Multiplexing
OFDMA	Orthogonal Frequency Division Multiple Access
P2P	Point-to-Point
PAPR	Peak to Average Power Ratio
QoS	Quality of Services
RASCCC	Resource Allocation with Shared Channel and Control Channel
RRM	Radio Resource Management
Rx	Receiver
SDMA	Spatial Domain Multiple Access

SINR	Signal to Interference Noise Ratio
SoA	State-Of-the-Art
SPS	Semi-Persistent Scheduling
TDMA	Time Domain Multiple Access
Tx	Transmitter
UE	User Equipment
UL	Up Link
UMTS	Universal Mobile Telecommunications System
WLAN	Wireless Local Area Network