

Dedication

To my eyes, which see life

To my parents

**All thanks and appreciation and respect for those who helped me step by step
to success**

To my brothers and sister

To all teach me to each of the characters

To my teachers

Acknowledgement

Initially, I would like to thank all thanks Allah, the merciful, for giving me the health to do this work.

I would like to express my sincere gratitude to my supervisor Dr. Rashid A. Saeed for his keen supervision unlimited help and invaluable guidance.

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Abstract

The goal of this work is to produce algorithm for coexistence in TVWS between 802.22 and 802.11 by equal opportunity without reduce in the delay time and throughput for each of them. Also, we investigate the coexistence problem between the 802.22 and the 802.11af systems in the TV White Spaces (TVWS). 802.22 And 802.11af are two typical standards envisioned to be widely adopted in the future. However, these two standards are heterogeneous in both power level and PHY/MAC design, making their coexistence challenging. We focus on the design of a co-channel coexistence scheme for the 802.22 customer-premises equipments (CPE) and the 802.11af systems. In this work, we identify the challenges to enable the co-channel coexistence of the 802.22 and the 802.11af systems and then propose algorithm depend of frame times. We apply the algorithm in two networks in three cases depending of amount of transmitting data .we find this propose solution increased the throughput and decrease the waiting time by a notable way for 802.11.

المستخلص

الهدف من هذا العمل هو انتاج خوارزميه للتعايش بين ال 802.11 وال 802.22 فى مجال الترددات الجديد وهو فراغ التلفزيونات الابيض بطريقه متساويه من غير تقليل زمن الانتظار والانتاجيه لكل منهمه. ايضا نقدم مشكله التعايش بين هذين الشبكتين فى فراغ التلفزيونات الابيض. ال 802.22 وال 802.11 هما من اكثر الشبكات المستعمله حاليا وستستعمل فى المستقبل. لكن كل من هذين الشبكتين متجانسين فى مستوى الطاقه وفى تصميم الطبقات هذا يجعل التعايش تحدى. سنركز فى تصميم تقنيه التعايش باشتراك القنوات بالنسبه لاجهزه ومبانى المستهلكين لل 802.22. فى هذا العمل سنعرف التحديات لنسمح للتعايش للقنوات المشتركه بين ال 802.11 وال 802.22 بعد ذلك سنقترح خوارزميه تعتمد على زمن الاطار وسنقوم بتطبيق الخوارزميه على كل من الشبكتين فى ثلاثه حالات اعتمادا على كميه البيانات المرسله. سنجد ان الخوارزميه المقترحه زادت الانتاجيه وقللت زمن الانتظار بطريقه ملحوظه لل 802.11.

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List of Abbreviations

AFH	Adaptive Frequency Hopping
AP	Access Point
BER	Bit Error Rate
BS	Base Station
BT	Busy Tone
CBP	Contention Beacon Protocol
CBT	Cooperative Busy Tone
CBT	Cooperative Busy Tone
CCA	Clear Channel Assessment
CDIS	Coexistence Data Base and Information Server
CDMA	Code Division Multiple Access
CE	Coexistence Enabler
CHE	Cluster Head Equipment
CM	Coexistence Manager

CPE	Customer Premises Equipment
CSMA	Carrier Sense Multiple Access
CWNs	Cognitive Wireless Networks
Db	Decibels
DCS	Dynamic Channel Selection
DFS	Dynamic Frequency Selection
DSA	Dynamic Spectrum Access
DTV	Digital Television
DYSPAN-S	Dynamic Spectrum Access Network Standard Committee
ECMA	European Computer Manufactures Association
EDT	Energy Detection Threshold
FCC	Federal Communication Commission
FDMA	Frequency Division Multiple Access
FEC	Forward Error Correction
FFT	Fast Fourier Transform
FT	Frame Time
IEEE	Institute of Electrical and Electronics Engineers
ISM	Industrial, Scientific and Medical Band

LBT	Listen Before Talk
LDPC	Low Density Parity Check
LMSC	LAN/MAN Standard committee
MIMO	Multiple Input Multiple Output
ODFC	On Demand Frame Contention
OFDMA	Orthogonal Frequency Division Multiplexing
PHY/MAC	Physical/Media Access Control
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Key
RF	Radio Frequency
RS	Reed Solomon
SCH	Supper Frame Control Header
SE	Spectrum Etiquette
SWIFT	A split Wideband Interferer Friendly Technology
TDMA	Time Division Multiple Access
TG	Task Group
TPC	Transmit Power Control
TV	Television

TVWS	Television White Space
UHF	Upper High Frequency
USA	United States of America
VHF	Very High Frequency
WG	Working Group
WLAN	Wireless Local Area Network
WMAN	Wireless Metropolitan Area Network
WPAN	Wireless Personal Area Network
WRAN	Wireless Regional Area Network
WSDs	White Space Data Base