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نوح

DEDICATION

This thesis is dedicated to my father, who taught me that the best kind of knowledge to have is that

which is learned for its own sake. It is also dedicated to my mother, who taught me that even the largest task can be accomplished if it is done one step at a time.

This thesis would be incomplete without a mention of the support given me by my cherished, Omar, to whom this thesis is dedicated. He was my own "soul out of my soul," who kept my spirits up when the muses failed me. Without his lifting me up when this thesis seemed interminable, I doubt it should ever have been completed.

For my family members who have inspired me. Their joy in others and inability to see difference as something that is wrong along with their desire to love and be loved touches my heart. Thank you for not only being my little family, but also my friends and to my friends too.

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المستخلص

نظم الاتصالات اللاسلكية ما بعد الجيل الثالث متنوعة. ويمكن توقع أن العديد من التكنولوجيات الراديوية المختلفة فضلاً عن عدة فئات من الأجهزة النقالة تشغل مجموعة متنوعة من التطبيقات وسوف يتم نشرها.

للتعامل مع وصف التنوع توجد نماذج مثل برمجة الشبكات و الشبكات النشطة ينبغي أن تدرج في رؤية الجيل الرابع لشبكات المحمول ونقترح خاصة تقييم نظم الوكيل المتعدد كواحد من الطرق التي تمكن تكنولوجيا الشبكات النشطة في شبكات الجوال ولذلك ، فإننا نسلط الضوء على بعض الخصائص الرئيسية لنظم الوكيل المتعدد ومناقشة المزايا المحتملة ، والمساوئ و مفاضلات سيناريو شبكة الجيل الرابع للهاتف المحمول.

هذه الأطروحة توضح الخطوط الأساسية للقضايا الفنية التي ينطوي عليها إنشاء مثل هذا النظام مع الأخذ في الاعتبار القدرة والأداء المتوقع في المستقبل من أنظمة الاتصالات المتنقلة. كما تشرف على تكوين النظام ، وتناقش الأنشطة المتصلة بتنفيذ أنظمة الوكيل المتعدد لشبكة الجيل الرابع للهاتف المحمول وذلك لتطوير الأداء و حل المشاكل.

في هذه الأطروحة العديد من مفاهيم العميل المتعدد لشبكة الجيل الرابع سوف تتم مناقشتها. قد تم تصميم نموذج محاكاة لتحديد الكفاءة للعميل المتعدد لشبكة الجيل الرابع.

Abstract

Wireless communication systems beyond the third generation will be diverse. It can be expected that several different radio technologies as well as several classes of mobile devices running a variety of applications will be deployed.

To cope with the described diversity, networking paradigms like programmable / active networking should be incorporated into the vision of “4G” mobile networks. Particularly, we propose to evaluate multi-agents as one enabling technology for active mobile networking. Therefore, we highlight some key properties of multi-agents and discuss their potential advantages, disadvantages and tradeoffs for a “4G” mobile network scenario.

This thesis outlines the technical issues involved in establishing such a system taking into consideration the capability and performance expected from future mobile communication systems. It also overviews the system configuration and discusses activities related to the implementation of multi-agent systems for a “4G” mobile network to enhance the performance and problems solving.

In this thesis, multi-agent systems in 4G concepts will be discussed. A common simulation platform is developed to quantify the performance of multi-agent systems in 4G.

ABBREVIATIONS AND ACRONYM	
2G	Second-Generation
3G	Third-Generation
4G	Fourth-Generation
A	
AAA	Authentication, Authorization and Accounting
ABC	Always Best Connected
ACL	Agent Communication Language
ACTS	Advanced Communications Technologies and Services
ADSL	Asymmetric Digital Subscriber Line
AI	Artificial Inelegance
AMPS	Advanced Mobile Phone System
AP	Access Point
API	Application Programming Interface
AR	Access Router
B	
BDI	Belief- Desire-Intention
BER	Bit Error Rate
BS	Base Station
BSS	Base Station subsystem
B(T)S	Base (Transceiver)Station
C	
CDMA	Code Division Multiple Access
CLIMATE	Code Division Multiple Access Cluster for Intelligent Mobile Agents for Telecommunication Environments
CPICH	Common Pilot Channel
CS	Cell Selection
D	

DAI	DIGITAL APPLICATION INTERNATIONAL
DL	Downlink
E	
E_b/I_0	Bit Energy to Interference ratio
E_c/I_0	Chip Energy to Interference ratio
EDGE	Enhanced Data rates for GSM Evolution
ES	Expanded Spectrum
ETSI	European Telecommunications Standards Institute
F	
FAIN	Future Active IP Networks
FCC	Federal Communications Commission
FDD	Frequency Division Duplex
FDMA	Frequency Division Multiple Access
FER	Frame Error Rate
FFT	Fast Fourier Transfer
G	
GMSK	Gaussian Minimum Shift Keying
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
H	
HCM	Handoff completion message
HDM	Handoff direction message
HHO	Hard Handover
HO	Hand Over
HSCSD	High Speed Circuit Switched Data
I	
IMT-2000	International Mobile Telephony
IP	Internet Protocol

IS	Interim Standards
IS-136	D-AMPS,US-TDMA system
IS-54	North America TDMA Digital cellular
IS-95	Cdma One,US-CDMA system
ISDN	Integrated services digital network
IT	Information Technology
ITU	International Telecommunications Union
J	
JDC	Japanese Digital Cellular
L	
LOS	Line-Of-Sight
M	
MAS	Multi-Agent Systems
MR	Mobile Router
MS	Mobile Station
MSC	Mobile Switching Center
MVNO	Mobile Virsual Network Operator
N	
NMT	Nordic Mobile Telephones
NTT	Nippon Telephone and Telegraph
O	
OFDM	Orthogonal Frequency Division Multiplexing
O&M	Operation & Maintenance
P	
PDA	Personal Digital Assistants
PCS	Personal Communication Services
PDC	Personal Digital Cellular
PLMN	Public Land Mobile Network
PSMM	Pilot strength measurement message
Q	

QoS	Quality of Service
QPSK	Quad Phase Shift Keying
R	
RAM	Radio Access Modes
RAN	Radio Access Network
RAT	Radio Access Technologies
RF	Radio Frequency
RNC	Radio Network Controller
RRM	Radio Resource Management
S	
SDR	Software Defined Radio
SACCH	Slow Associated Control Channel
SCH	Synchronization channel
SHO	Soft Handover
SIR	Signal-to-interference Ratio
T	
TACS	Total Access Communication Systems
TDD	Time Division Duplex
TDMA	Time Division Multiple Access
TPC	Transmit Power Control
TRHO	Traffic Reason Handover
U	
UL	Uplink
UMTS	Universal Mobile Telecommunications Services
UTRA	UMTS Terrestrial Radio Access
V	
VLR	Visitor Location Register
W	
WARC	World Administrative Radio Conference
WCDMA	Wideband Code Division Multiple Access
WLAN	Wireless Local Area Network

