Dedication

To my family

Abstract

The mobile system terminals allow the users to access communication services while on moving. This essential characteristic has been the headmaster of the main factors those drive the growth in mobile network industries to be massive in less than 20 years .

There is a great focus on the uplink algorithms in the third generation mobile system or 3G. This thesis study in-depth ,the mobile communications introducing by the first generation through the second generation to the third one by discussing the main features of these generations , advantages and disadvantages without neglecting the comparison between these generations focusing on downlink algorithms in order to improve the capacity for 3G. The more important parameter which affect the quality of service is how to improve the handover . Handover is the greatest factor that determines the performance of the mobile terminals. The soft handover that used in third generation mobile has the best performance compared to that hard handover employed in the second generation.

This thesis deeply concentrates on solving the problem occurs by this soft handover . The target is to clear signaling overload which is the problem created by soft handover percentage. The data collected from Sudani network and analyzed by using MATLAB. The results of Sudani network analyses used for traffic generation in a simulation which developed by MATLAB code. Three scenarios carried to optimize the soft handover based on the number of simulation users or factories in the capacity improvements .

بسم الله الرحمن الرحيم

تجريد

إن أجهزة الهواتف النقالة تتيح لمستخدميها الخدمة أثناء الحركة وهذه الخاصية جعلت من الهاتف الجوال رأس الرمح فى عملية صناعة وتطوير شبكات الهواتف النقالة خلال أقل من عشرين عاماً .

لقد تركزت الكثير من البحوث فى مجال الإرسال الخاص بهواتف الجيل الثالث. هذا البحث يدرس بعمق ، إتصالات الهواتف النقالة من خلال تعرضه للجيل الأول والثانى والثالث بمزاياها وعيوبها من دون إهمال المقارنة بينها مركزاً على مجال الإستقبال من أجل تحسين السعات للجيل الثالث . إن العامل الأهم لتحسين جودة الخدمة هو كيفية تحسين التحويل وهو العامل الأعظم فى تحديد أداء الهواتف النقالة. التحويل السلس المستخدم فى الجيل الثالث هو الأفضل من ذلك المستخدم فى الجيل الثانى.

إن هذا البحث يركز على حل المعضلة الناجمة عن التحويل فى الجيل الثالث وهى التحميل الزائد على نظام الإشارات . لقد تم جمع البيانات من شبكة سودانى ومن ثم تحليلها و إستخدام النواتج كمدخلات للمخطط البيانى وصنع الخوارزمية وتطويرها بالمحاكاة ومن ثم إستخدام نظام وشفرة برنامج MATLAB.

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Finally , I want to dedicate this thesis to my mother ,father, wife , my whole family and friends.

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Abbreviations

AMPS	:	Advanced Mobile Phone System.
USA	:	United States of America.
FDMA	:	Frequency Division Multiple Access.
GSM	:	Group Special for Mobile.
TDMA	:	Time Division Multiple Access.
GPRS	:	General Packet Radio Service.
3G	:	Third Generation Mobile.
CDMA	:	Code Division Multiple Access.
MTSO	:	Mobile Telephone Switching Office.
MSC	:	Mobile Switching Centre.
MS	:	Mobile Station.
BSC	:	Base Station Controller.
PSTN	:	Public Switched Telephone Network.
C/N	:	Carrier To Noise Ratio.
PSC	:	Personal Communication System.
RF	:	Radio Frequency.
UMTS	:	Universal Mobile Telephone System.
MBps	:	Mega Bits per second.
W-CDMA	:	Wide Code division Multiple Access.
IF	:	Intermediate Frequency.
CRC	:	Cyclic Redundancy Check.
AGC	:	Automatic Gain Control.
TPC	:	Transmit Power Control.
MC-CDMA	:	Multi-carrier Code Division Multiple Access.
SIR	:	Signal to Interference Power Ratio .
BER	:	Bit Error Rate .
GOS	:	Quality of Service.

EB/NO	:	Energy Per Bit Over Noise.
PACA	:	Priority Access Channel Assignment.
SF	:	Spreading Factor.
FEC	:	Forward Error Correction .
4G	:	Fourth Generation .
PSK	:	Phase Shift Keying.
QAM	:	Quadratic Amplitude Modulation .
BTS	:	Base Transceiver Station.
RRM	:	Radio Recourse Management.
UE	:	User Equipment .
MM	:	Mobility Management.
SGSN	:	Service GPRS Support Node.
ACK	:	Acknowledgement.
HO	:	Handover.
BS	:	Base Station.
T-ADD	:	Pilot Directional Threshold.
T-Comp	:	Comparison threshold.
T-Drop	:	Drop Timer Threshold.
T-Drop	:	Pilot Drop Threshold.
PSMM	:	Pilot Strength Measurement Message.
HDM	:	Handover Direction Message.
HCM	:	Handover Complete Message.
NULM	:	Neighbor List Update Message.
PN	:	Pin Number.
BSS	:	Base Station System.
SHOP	:	Soft Handover Percentage.
VSHO	:	Voice Soft Handover.

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VC	:	voice Cell in Erlang.
SM	:	Short Message.
Gp	:	Processing Gain.
M	:	Number of Simulation User.
Vf	:	voice Activity Factor.
B	:	Bandwidth.
Rb	:	Information Bit Rate.
C	:	Calls Arrived.
A	:	Traffic in Erlangs.
T	:	Call duration.
H	:	Busy Hour.
LNA	:	Low Noise Amplifier.
Ra	:	Interference power from Mobile in Adjacent Cell.
Rb	:	Interference Power From Mobile in The Same Cell.
3GPP	:	Third Generation Partnership group.
EV-DO	:	Evolution of data optimized.

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