

CONTENTS

	Page No.
<i>Acronyms</i>	
<i>List of Figures</i>	
<i>List of Tables</i>	
<i>Symbols</i>	
<i>Preface of the Thesis</i>	
1. Introduction to Mobile Wireless Communication Technologies and QoS	1-16
1.1. Introduction	1
1.2. Mobile Wireless Communication Technologies	3
1.3. Recent advances in Mobile Wireless Communication	4
1.3.1. Worldwide interoperability for Microwave Access (WiMAX)	
1.3.2. Long Term Evolution-Advanced (LTE - A)	
1.3.3. Satellite	
1.3.4. High Altitude Platforms	
1.4. Comparison of Mobile Wireless Communication Technologies	6
1.5. Quality of Service (QoS)	7
1.5.1. QoS in WiMAX	
1.5.2. QoS in LTE-A	
1.5.3. QoS in Satellite	
1.5.4. QoS in HAP	
1.5.5. QoS: The Techniques & Processes	
1.6. The Possibility of Coexistence	11
1.6.1. Coexistence of Mobile Wireless Techniques	
1.6.2. Coexistence of Terrestrial and Satellite Based Comm. Systems	
1.6.3. Coexistence of HAP and Terrestrial WiMAX Based Networks	
1.7. Performance of Integrated Terrestrial/ HAP and Satellite Systems	15

2. HAP Overview and literature Survey, Problem Definition	22-46
2.1. High Altitude Platform Overview	22
2.1.1. Position and Altitude of HAP	
2.2. HAP Network Architecture	27
2.2.1. A stand-Alone HAP System	
2.2.2. Integrated HAP-Terrestrial System	
2.2.3. Integrated Terrestrial-HAP-Satellite System	
2.3. Coverage of HAP	30
2.4. HAP Spectrum Allocation	31
2.5. Applications of HAP	32
2.5.1. HAP for Emergency Communication	
2.5.2. HAP Application for Wireless Communication Technologies	
2.6. History of HAP	34
2.7. Research Oriented Projects	35
2.8. Motivation and Previous Work	36
2.9. Objectives	42
2.10. Definition of the Problem	42
3. QoS Enhancement by Using Intelligent Hand-off Technique	51-89
3.1. Introduction	51
3.2. Cellular Concept	53
3.3. HAP based Cellular Network Deployment	54
3.4. The Concept of Hand-off	58
3.4.1. Desirable Features of Hand-off	
3.4.2. Classification of Hand-off	
3.4.3. Hand-off Procedure	
3.5. HAP Movement	62
3.5.1. Vertical Shifting	
3.5.2. Horizontal Shifting	
3.5.3. Using Steerable Antenna for Hand-off	
3.6. Antennas for HAP	66
3.6.1. Antenna Radiation Pattern	

3.7.	Intelligent Hand-off Requirements	68
3.7.1.	Spectrum Etiquettes using for Coexistence Enhancement	
3.7.2.	Receive Signal Strength for Hand-off	
3.7.3.	Propagation Path Model	
3.7.4.	Traffic Intensity	
3.7.5.	Time Advance Technique	
3.7.6.	The MUSIC Technique	
3.7.7.	Distance	
3.8.	Neural Network for Hand-off	76
3.8.1.	Radial Based Function Network	
3.9	The Proposed Technique for Intelligent Hand-off	80
3.10.	Result and Discussion	83
3.10.1.	Conclusion – I : Coexistence Performance	
3.10.2.	Conclusion – II : Service Probability Performance	
3.10.3.	Conclusion – III : Receive Signal Strength	
3.10.4.	Conclusion – IV : An Intelligent Hand-off by Applied ANN	
3.11	Conclusions	89
4.	<i>QoS Enhancement by Using Channel Reservation Technique</i>	94-116
4.1.	Introduction	94
4.2.	Channel Allocation Techniques	97
4.2.1.	Fixed Channel Allocation (FCA)	
4.2.2.	Dynamic Channel Allocation	
4.2.3.	Hybrid Channel Allocation	
4.2.4.	Exploiting Cell Overlapping	
4.3.	Probability of Call Blocking and Dropping	106
4.4.	The Proposed Reservation Channel Technique	107
4.4.1.	Procedures and Algorithm	
4.4.2.	Probability Model of the Proposed Technique	
4.5.	QoS Analysis of the Proposed Technique	112
4.6.	Results and Discussion	113
4.7.	Conclusion	116

5. <i>QoS Enhancement by Using Call Admission Control Technique</i>	121-147
5.1. Introduction	121
5.2. Call Admission Control Technique	124
5.3. CAC Principles	127
5.4. CAC and QoS Requirement	128
5.4.1 Bandwidth Degradation	
5.4.2 Bandwidth Reservation	
5.4.3 QoS Requirements	
5.5. Proposed CAC	135
5.6. Algorithm of CAC Technique	136
5.7. Analytical Model of a HAP Station as a Markov Chain Model	139
5.7.1 Calculation of Bandwidth Utilization	
5.7.2 Calculation of New Connection Blocking Probability	
5.7.3 Hand-off Connection Dropping Probability	
5.8. Result and Discussion	143
5.9. Conclusion	147
6. <i>Conclusion and Future Scope</i>	152-156
6.1. Summary	152
6.2. Summary of the Existing Techniques for Improving QoS	154
6.3. Conclusion	155
6.4. Future Scope of the Work	156

References

List of Papers Published

Reprints of Journals SCI and DOAJ Papers

A Personal Profile of Author