

## LIST OF FIGURES

Figure 1.1:	Different kinds of wireless networks	5
Figure 1.2:	Example of an infrastructure network (WLAN)	6
Figure 1.3:	Example of an infrastructure-less (ad-hoc) network	7
Figure 1.4:	Multi-hop wireless ad-hoc network	15
Figure 1.5:	Classification of routing protocols in ad-hoc networks	19
Figure 1.6:	Classification of mobility model	28
Figure 1.7:	Movement of nodes under RWPM	30
Figure 1.8:	Infrastructure mode	31
Figure 1.9:	IEEE ad-hoc mode	32
Figure 1.10:	Flowchart for NS-3	38
Figure 1.11:	Architecture of NS-3	39
Figure 1.12:	QualNet architecture	40
Figure 1.13:	Scenario based simulation	40
Figure 2.1:	RREQ packet format	70
Figure 2.2:	RREP packet format	71
Figure 2.3:	RERR packet format	72
Figure 2.4:	Pictorial presentation of AODV routing procedure	74
Figure 2.5:	Reverse route setting	76
Figure 2.6:	Forward route setting	77
Figure 2.7:	I. Route error, and II. Route maintenance	80
Figure 2.8:	Impact of ART on connectivity	87
Figure 2.9:	Concept of delete period	88
Figure 2.10:	Impact of node's mobility on connectivity	89
Figure 2.11:	Impact of NLD on connectivity	91
Figure 3.1:	Overview of simulation under NS-3	95
Figure 3.2:	Net Throughput for ART=0.5	99
Figure 3.3:	Net Throughput for ART=1.0	99
Figure 3.4:	Net Throughput for ART=1.5	100
Figure 3.5:	Net Throughput for ART=2.0	100
Figure 3.6:	Net Throughput for ART=2.5	100

Figure 3.7:	Net Throughput for ART=3.0	100
Figure 3.8:	Net Throughput for ART=4.0	101
Figure 3.9:	Net Throughput for ART=6.0	101
Figure 3.10:	Net Throughput for ART=8.0	101
Figure 3.11:	Net Throughput for ART=10.0	101
Figure 3.12:	PDR for ART=0.5	102
Figure 3.13:	PDR for ART=1.0	102
Figure 3.14:	PDR for ART=1.5	102
Figure 3.15:	PDR for ART=2.0	102
Figure 3.16:	PDR for ART=2.5	103
Figure 3.17:	PDR for ART=3.0	103
Figure 3.18:	PDR for ART=4.0	103
Figure 3.19:	PDR for ART=6.0	103
Figure 3.20:	PDR for ART=8.0	104
Figure 3.21:	PDR for ART=10.0	104
Figure 3.22:	Snapshot of simulation topology for 20 human devices under wireless subnet (X-Y view)	113
Figure 3.23:	Snapshot of simulation topology for 20 human devices under wireless subnet (3-D view)	114
Figure 3.24:	Throughput for ART=0.5	114
Figure 3.25:	Throughput for ART=2.0	114
Figure 3.26:	Throughput for ART=3.0	115
Figure 3.27:	Throughput for ART=3.5	115
Figure 3.28:	Throughput for ART=5.0	115
Figure 3.29:	Average Delay for ART=0.5	116
Figure 3.30:	Average Delay for ART=2.0	116
Figure 3.31:	Average Delay for ART=3.0	116
Figure 3.32:	Average Delay for ART=3.5	116
Figure 3.33:	Average Delay for ART=5.0	117
Figure 3.34:	Average Jitter for ART=0.5	117
Figure 3.35:	Average Jitter for ART=2.0	117
Figure 3.36:	Average Jitter for ART=3.0	117
Figure 3.37:	Average Jitter for ART=3.5	117

Figure 3.38:	Average Jitter for ART=5.0	117
Figure 3.39:	% of Loss Packet for ART=0.5	119
Figure 3.40:	% of Loss Packet for ART=2.0	119
Figure 3.41:	% of Loss Packet for ART=3.0	119
Figure 3.42:	% of Loss Packet for ART=3.5	119
Figure 3.43:	% of Loss Packet for ART=5.0	120
Figure 4.1:	Snapshot of 60 nodes in QualNet scenario for VBR traffic (X-Y view)	134
Figure 4.2:	Snapshot of 60 nodes in QualNet scenario for VBR traffic (3-D view)	135
Figure 4.3:	Throughput Vs DPC; for variable ART (VBR Traffic)	136
Figure 4.4:	Throughput Vs DPC; for variable ART (CBR Traffic)	137
Figure 4.5:	Average end-to-end delay Vs DPC; for variable ART (VBR Traffic)	139
Figure 4.6:	Average end-to-end delay Vs DPC; for variable ART (CBR Traffic)	140
Figure 4.7:	Average jitter Vs DPC; for variable ART (VBR Traffic)	141
Figure 4.8:	Average jitter Vs DPC; for variable ART (CBR Traffic)	142
Figure 4.9:	Throughput Vs DPC; for variable SD pair (CBR & VBR)	143
Figure 4.10:	Average end-to-end delay Vs DPC; for variable SD pair (CBR & VBR)	145
Figure 4.11:	Average jitter Vs DPC; for variable SD pair (CBR & VBR)	146
Figure 5.1:	Throughput Vs ART	157
Figure 5.2:	Delay Vs ART	158
Figure 5.3:	Jitter Vs ART	159
Figure 5.4:	Throughput Vs Node's Mobility at ART=3	161
Figure 5.5:	Throughput Vs Node's Mobility at ART=1	162
Figure 5.6:	Throughput Vs ART at default QualNet transmission power	164
Figure 5.7:	Throughput Vs ART at calculated transmission powers	165
Figure 5.8:	Throughput Vs Node's Mobility at default transmission power	168
Figure 5.9:	Throughput Vs Node's Mobility at calculated transmission powers	169
Figure 6.1:	Throughput (bits/second) as a function of the pause time	179
Figure 6.2:	End-To-End Delay (seconds) as a function of the pause time	180

Figure 6.3:	Jitter (seconds) as a function of the pause time	181
Figure 6.4:	PDR as a function of the pause time	182