

LIST OF TABLES

Table		Page
3.1	Simulation Parameters of ENTM	47
3.2	PDR values of ENTM and TLEACH for 50 nodes	49
3.3	PLR values of ENTM and TLEACH for 50 nodes	50
3.4	Average Delay values of ENTM and TLEACH for 50 nodes	51
3.5	Throughput values of ENTM and TLEACH for 50 nodes	53
3.6	RE values of ENTM and TLEACH for 50 nodes	54
3.7	PDR values of ENTM and TLEACH for 100 nodes	56
3.8	PLR values of ENTM and TLEACH for 100 nodes	57
3.9	Average Delay values of ENTM and TLEACH for 100 nodes	59
3.10	Throughput values of ENTM and TLEACH for 100 nodes	60
3.11	RE values of ENTM and TLEACH for 100 nodes	61
4.1	Simulation Parameters of TEEHC	69
4.2	PDR values of TEEHC and TMA for 50 nodes	70
4.3	PLR values of TEEHC and TMA for 50 nodes	72
4.4	Average Delay values of TEEHC and TMA for 50 nodes	73
4.5	Throughput values of TEEHC and TMA for 50 nodes	75
4.6	RE values of TEEHC and TMA for 50 nodes	76

4.7	PDR values of TEEHC and TMA for 100 nodes	78
4.8	PLR values of TEEHC and TMA for 100 nodes	79
4.9	Average Delay values of TEEHC and TMA for 100 nodes	81
4.10	Throughput values of TEEHC and TMA for 100 nodes	82
4.11	RE values of TEEHC and TMA for 100 nodes	83
5.1	Simulation Parameters of HTECH	91
5.2	PDR values of HTECH and GTMS for 50 nodes	93
5.3	PLR values of HTECH and GTMS for 50 nodes	94
5.4	Average Delay values of HTECH and GTMS for 50 nodes	96
5.5	Throughput values of HTECH and GTMS for 50 nodes	97
5.6	RE values of HTECH and GTMS for 50 nodes	99
5.7	PDR values of HTECH and GTMS for 100 nodes	100
5.8	PLR values of HTECH and GTMS for 100 nodes	101
5.9	Average Delay values of HTECH and GTMS for 100 nodes	103
5.10	Throughput values of HTECH and GTMS for 100 nodes	104
5.11	RE values of HTECH and GTMS for 100 nodes	106
6.1	Simulation Parameters of EDCTE	112
6.2	PDR values of EDCTE and TAGR for 50 nodes	114
6.3	PLR values of EDCTE and TAGR for 50 nodes	116

6.4	Average Delay values of EDCTE and TAGR for 50 nodes	117
6.5	Throughput values of EDCTE and TAGR for 50 nodes	118
6.6	RE values of EDCTE and TAGR for 50 nodes	120
6.7	PDR values of EDCTE and TAGR for 100 nodes	121
6.8	PLR values of EDCTE and TAGR for 100 nodes	123
6.9	Average Delay values of EDCTE and TAGR for 100 nodes	124
6.10	Throughput values of EDCTE and TAGR for 100 nodes	126
6.11	RE values of EDCTE and TAGR for 100 nodes	127

LIST OF FIGURES

Figure		Page
1.1	Wireless Sensor Network	2
1.2	Wireless Sensor Network – General Working Strategy	6
1.3	Flat topology of a WSN	13
1.4	Hierarchical Topology in a WSN	14
1.5	Forest fire detection	15
1.6	Construction work	16
1.7	Military application	16
1.8	Medical application	17
2.1	Literature Survey of Hierarchical WSNs	21
2.2	Strategy of LEACH	25
2.3	EEHTM scheme	32
2.4	Calculating trustworthiness in cluster network	35
3.1	A node in ENTM	43
3.2	Packet Delivery Rate of ENTM and TLEACH for 50 nodes	48
3.3	Packet Loss Rate of ENTM and TLEACH for 50 nodes	50
3.4	Average Delay of ENTM and TLEACH for 50 nodes	51
3.5	Throughput of ENTM and TLEACH for 50 nodes	53
3.6	Residual Energy of ENTM and TLEACH for 50 nodes	55
3.7	Packet Delivery Rate of ENTM and TLEACH for 100 nodes	56
3.8	Packet Loss Rate of ENTM and TLEACH for 100 nodes	58
3.9	Average Delay of ENTM and TLEACH for 100 nodes	58
3.10	Throughput of ENTM and TLEACH for 100 nodes	60

3.11	Residual Energy of ENTM and TLEACH for 100 nodes	62
4.1	Illustration of Trusted Route	66
4.2	Flowchart of TEEHC	67
4.3	Packet Delivery Rate of TEEHC and TMA for 50 nodes	71
4.4	Packet Loss Rate of TEEHC and TMA for 50 nodes	72
4.5	Average Delay of TEEHC and TMA for 50 nodes	74
4.6	Throughput of TEEHC and TMA for 50 nodes	75
4.7	Residual Energy of TEEHC and TMA for 50 nodes	77
4.8	Packet Delivery Rate of TEEHC and TMA for 100 nodes	78
4.9	Packet Loss Rate of TEEHC and TMA for 100 nodes	80
4.10	Average Delay of TEEHC and TMA for 100 nodes	80
4.11	Throughput of TEEHC and TMA for 100 nodes	82
4.12	Residual Energy of TEEHC and TMA for 100 nodes	84
5.1	Illustration of HTECH	89
5.2	Working Flow of HTECH	90
5.3	Packet Delivery Rate of HTECH and GTMS for 50 nodes	92
5.4	Packet Loss Rate of HTECH and GTMS for 50 nodes	94
5.5	Average Delay of HTECH and GTMS for 50 nodes	95
5.6	Throughput of HTECH and GTMS for 50 nodes	97
5.7	Residual Energy of HTECH and GTMS for 50 nodes	98
5.8	Packet Delivery Rate of HTECH and GTMS for 100 nodes	100
5.9	Packet Loss Rate of HTECH and GTMS for 100 nodes	102
5.10	Average Delay of HTECH and GTMS for 100 nodes	120

5.11	Throughput of HTECH and GTMS for 100 nodes	104
5.12	Residual Energy of HTECH and GTMS for 100 nodes	106
6.1	EDCTE Structure	109
6.2	Flowchart of the EDCTE scheme	111
6.3	Packet Delivery Rate of EDCTE and TAGR for 50 nodes	114
6.4	Packet Loss Rate of EDCTE and TAGR for 50 nodes	115
6.5	Average Delay of EDCTE and TAGR for 50 nodes	117
6.6	Throughput of EDCTE and TAGR for 50 nodes	119
6.7	Residual Energy of EDCTE and TAGR for 50 nodes	120
6.8	Packet Delivery Rate of EDCTE and TAGR for 100 nodes	122
6.9	Packet Loss Rate of EDCTE and TAGR for 100 nodes	123
6.10	Average Delay of EDCTE and TAGR for 100 nodes	125
6.11	Throughput of EDCTE and TAGR for 100 nodes	125
6.12	Residual Energy of EDCTE and TAGR for 100 nodes	127
7.1(a-e)	NAM snapshot of 50 nodes scenario	130
7.2(a-e)	NAM snapshot of 100 nodes scenario	133
7.3	Packet Delivery Rate of ENTM, TEEHC, HTECH and EDCTE for 50 nodes	136
7.4	Packet Delivery Rate of ENTM, TEEHC, HTECH and EDCTE for 100 nodes	136
7.5	Packet Loss Rate of ENTM, TEEHC, HTECH and EDCTE for 50 nodes	137
7.6	Packet Loss Rate of ENTM, TEEHC, HTECH and EDCTE for 100 nodes	138
7.7	Average Delay of ENTM, TEEHC, HTECH and EDCTE for 50 nodes	138
7.8	Average Delay of ENTM, TEEHC, HTECH and EDCTE for 100 nodes	139

7.9	Throughput of ENTM, TEEHC, HTECH and EDCTE for 50 nodes	140
7.10	Throughput of ENTM, TEEHC, HTECH and EDCTE for 100 nodes	140
7.11	Residual Energy of ENTM, TEEHC, HTECH and EDCTE for 50 nodes	141
7.12	Residual Energy of ENTM, TEEHC, HTECH and EDCTE for 100 nodes	141