List of Figures

1.1 Emergency services illustration in Bandung 2

2.1 Emergency Service Center in Bandung 5
2.2 Emergency Units consist of ambulance, police, and fire brigade . 6
2.3 Spatial Data Types 7
2.4 map overlay illustration 8
2.5 Graph ABCDEFG 9
2.6 Road Network System 10
2.7 K-Nearest Neighbor 11
2.8 KNN algorithm in road network 12
2.9 Voronoi Diagram 13
2.10 Network Voronoi Diagram 14

3.1 Methodology Flow Diagram (1) 16
3.2 Methodology Flow Diagram (2) 17
3.3 System Description 18
3.4 System Flowchart 19
3.5 Border Point Determination Flowchart 21
3.6 Nearest Unit Classification Flowchart 22
3.7 Flowchart Kth-Nearest Emergency Unit Determination 23

4.1 Bandung administrative map 25
4.2 Ambulance location in Bandung 27
4.3 Police location in Bandung 28
4.4 Fire Brigade location in Bandung 29
4.5 RSU Al-Islam Map 30
4.6 Expansion Flow of RSU Al-Islam Hospital to RSU KCK Pindad 31
4.7 Border Point 441 Location 32
4.8 Vertex 48 Location 33
4.9 Nearest Emergency Unit from Vertex 48 35
4.10 Emergency Location Coordinate 36
4.11 3rd-Nearest Emergency Unit from QP 38
4.12 3-NN ambulance to emergency location 39

5.1 Border Point Determination Result for Police Unit 41
5.2 Border Point Determination Result for Ambulance Unit 42
5.3 Border Point Determination Result for Fire Brigade Unit 43
5.4 Network Voronoi Diagram for Police Unit 44
5.5 Network Voronoi Diagram for Ambulance Unit 45
5.6 Network Voronoi Diagram for Fire Brigade Unit 45
5.7 Execution Time Comparison Graph for Police Unit 47
5.8 Execution Time Comparison Graph for Ambulance Unit 47
5.9 Execution Time Comparison Graph for Fire Brigade Unit 47