

# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Graph algorithms . . . . .	1
1.2	Computational complexities of algorithms . . . . .	2
1.3	Graph theoretic definitions and notations . . . . .	3
1.4	Some special graphs and related definitions . . . . .	7
1.5	The graphs under consideration . . . . .	10
1.5.1	Interval graphs . . . . .	10
1.5.2	Permutation graphs . . . . .	11
1.5.3	Circular-arc graphs . . . . .	13
1.5.4	Trapezoid graphs . . . . .	13
1.5.5	Fuzzy interval graph . . . . .	14
1.6	Motivation of the work . . . . .	15
1.7	Survey of related works of the thesis . . . . .	16
1.8	An overview of the thesis . . . . .	19
1.9	Summary . . . . .	20
<b>2</b>	<b>Inverse 1-center location problem on trees</b>	<b>23</b>
2.1	Introduction . . . . .	23
2.1.1	Applications of the problem . . . . .	24
2.1.2	Organization of the chapter . . . . .	25
2.2	Basic terminologies and results . . . . .	25
2.3	Algorithm and its complexity . . . . .	27
2.4	Summary . . . . .	30
<b>3</b>	<b>Inverse 1-center location problem and MADT on interval graphs</b>	<b>31</b>
3.1	Introduction . . . . .	31
3.2	Organization of the chapter . . . . .	33

3.3	Inverse 1-center location problem on interval graphs . . . . .	34
3.3.1	Data structure and construction of the tree . . . . .	34
3.3.2	Algorithm and its complexity . . . . .	41
3.4	MADT on fuzzy interval graph . . . . .	45
3.4.1	Interval numbers and their arithmetic . . . . .	45
3.4.2	Data structure and construction of the tree . . . . .	46
3.4.3	Modification of the spanning tree $T_{IG}$ . . . . .	52
3.4.4	Average distance of interval graph . . . . .	54
3.4.5	Algorithm and its complexity on average distance . . . . .	54
3.5	Summary . . . . .	56
<b>4</b>	<b>MADT and inverse 1-center location problem on CirGs</b>	<b>59</b>
4.1	Introduction . . . . .	59
4.2	Organization of the chapter . . . . .	62
4.3	Minimum average distance tree on circular-arc graph . . . . .	62
4.3.1	Construction of BFS tree on circular-arc graph . . . . .	62
4.3.2	Computation of minimum diameter spanning tree . . . . .	64
4.3.3	Modification of the spanning tree $T$ . . . . .	66
4.3.4	Algorithm and time complexity on minimum average distance tree of circular-arc graph . . . . .	68
4.4	Inverse 1-center location problem on the weighted circular-arc graphs . . . . .	72
4.4.1	Construction of minimum height tree . . . . .	72
4.4.2	Algorithm and its complexity . . . . .	80
4.5	Summary . . . . .	84
<b>5</b>	<b>MADT and inverse 1-centre location problem on PerGs</b>	<b>85</b>
5.1	Introduction . . . . .	85
5.2	Organization of the chapter . . . . .	86
5.3	MADT for permutation graph . . . . .	87
5.3.1	Construction of BFS tree on permutation graph . . . . .	87
5.3.2	Computation of minimum diameter spanning tree . . . . .	87
5.3.3	Modification of the spanning tree $T$ . . . . .	90
5.3.4	Algorithm and its complexity . . . . .	91
5.3.5	Illustration of the algorithm . . . . .	92
5.4	Inverse 1-centre location problem on weighted permutation graphs . . . . .	94

5.4.1	Construction of BFS tree on weighted permutation graph . . . . .	94
5.4.2	Computation of minimum diameter spanning tree . . . . .	94
5.4.3	Algorithm and its complexity . . . . .	101
5.5	Summary . . . . .	106
<b>6</b>	<b>Inverse 1-center location problem on trapezoid graphs</b>	<b>107</b>
6.1	Introduction . . . . .	107
6.1.1	Organization of the chapter . . . . .	107
6.2	Construction of minimum height tree for trapezoidal graph . . . . .	108
6.3	Inverse 1-center location problem for trapezoidal graph . . . . .	112
6.4	Algorithm and its complexity . . . . .	116
6.5	Summary . . . . .	121
<b>7</b>	<b>Conclusion</b>	<b>123</b>

