

# Contents

<b>1</b>	<b>Introduction</b> .....	1
1.1	Data Mining .....	4
1.1.1	Association Rule Mining (ARM) .....	4
1.1.2	Incremental Mining .....	5
1.1.3	Distributed Data Mining .....	6
1.1.4	Sequential Mining .....	6
1.1.5	Clustering .....	6
1.1.6	Classification .....	8
1.1.7	Characterization .....	8
1.1.8	Discrimination .....	9
1.1.9	Deviation Mining .....	9
1.1.10	Evolution Mining .....	9
1.1.11	Prediction .....	10
1.1.12	Web Mining .....	10
1.1.13	Text Mining .....	11
1.1.14	Data Warehouses .....	11
1.2	Soft Computing .....	13
1.2.1	Importance of Soft Computing .....	13
1.2.2	Genetic Algorithms .....	13
1.2.3	Neural Networks .....	14
1.2.4	Support Vector Machines .....	14
1.2.5	Fuzzy Logic .....	15
1.2.6	Rough Sets .....	16
1.3	Data Mining Applications .....	16
	References .....	17
<b>2</b>	<b>Self Adaptive Genetic Algorithms</b> .....	19
2.1	Introduction .....	19
2.2	Related Work .....	20
2.3	Overview .....	22
2.4	Algorithm .....	23

2.4.1	Problem Definition .....	23
2.4.2	Pseudocode .....	23
2.5	Mathematical Analysis .....	25
2.5.1	Convergence Analysis .....	30
2.6	Experiments .....	32
2.7	Performance Analysis .....	40
2.8	A Heuristic Template Based Adaptive Genetic Algorithms .....	42
2.8.1	Problem Definition .....	42
2.9	Example .....	42
2.10	Performance Analysis of HTAGA .....	44
2.11	Summary .....	48
	References .....	49
<b>3</b>	<b>Characteristic Amplification Based Genetic Algorithms .....</b>	<b>51</b>
3.1	Introduction .....	51
3.2	Formalizations .....	52
3.3	Design Issues .....	54
3.4	Algorithm .....	55
3.5	Results and Performance Analysis .....	58
3.6	Summary .....	61
	References .....	61
<b>4</b>	<b>Dynamic Association Rule Mining Using Genetic Algorithms .....</b>	<b>63</b>
4.1	Introduction .....	63
4.1.1	Inter Transaction Association Rule Mining .....	64
4.1.2	Genetic Algorithms .....	65
4.2	Related Work .....	66
4.3	Algorithms .....	67
4.4	Example .....	69
4.5	Performance Analysis .....	74
4.5.1	Experiments on Real Data .....	78
4.6	Summary .....	79
	References .....	79
<b>5</b>	<b>Evolutionary Approach for XML Data Mining .....</b>	<b>81</b>
5.1	Semantic Search over XML Corpus .....	82
5.2	The Existing Problem .....	83
5.2.1	Motivation .....	84
5.3	XML Data Model and Query Semantics .....	85
5.4	Genetic Learning of Tags .....	86
5.5	Search Algorithm .....	89
5.5.1	Identification Scheme .....	89

5.5.2	Relationship Strength .....	90
5.5.3	Semantic Interconnection .....	91
5.6	Performance Studies .....	93
5.7	Selective Dissemination of XML Documents .....	99
5.8	Genetic Learning of User Interests .....	101
5.9	User Model Construction .....	102
5.9.1	SVM for User Model Construction .....	103
5.10	Selective Dissemination .....	103
5.11	Performance Analysis .....	105
5.12	Categorization Using SVMs .....	108
5.12.1	XML Topic Categorization .....	108
5.12.2	Feature Set Construction .....	109
5.13	SVM for Topic Categorization .....	111
5.14	Experimental Studies .....	113
5.15	Summary .....	116
	References .....	117
<b>6</b>	<b>Soft Computing Based CBIR System .....</b>	<b>119</b>
6.1	Introduction .....	119
6.2	Related Work .....	120
6.3	Model .....	121
6.3.1	Pre-processing .....	122
6.3.2	Feature Extraction .....	122
6.3.3	Feature Clustering .....	126
6.3.4	Classification .....	126
6.4	The STIRF System .....	128
6.5	Performance Analysis .....	129
6.6	Summary .....	136
	References .....	136
<b>7</b>	<b>Fuzzy Based Neuro - Genetic Algorithm for Stock Market Prediction .....</b>	<b>139</b>
7.1	Introduction .....	139
7.2	Related Work .....	140
7.3	Model .....	141
7.4	Algorithm .....	146
7.4.1	Algorithm FEASOM .....	146
7.4.2	Modified Kohonen Algorithm .....	146
7.4.3	The Genetic Algorithm .....	148
7.4.4	Fuzzy Inference System .....	149
7.4.5	Backpropagation Algorithm .....	149
7.4.6	Complexity .....	149
7.5	Example .....	150
7.6	Implementation .....	152
7.7	Performance Analysis .....	154

7.8	Summary	165
	References	165
<b>8</b>	<b>Data Mining Based Query Processing Using Rough Sets and GAs</b>	167
8.1	Introduction	167
8.2	Problem Definition	169
8.3	Architecture	170
	8.3.1 Rough Sets	171
	8.3.2 Information Streaks	174
8.4	Modeling of Continuous-Type Data	175
8.5	Genetic Algorithms and Query Languages	180
	8.5.1 Associations	181
	8.5.2 Concept Hierarchies	182
	8.5.3 Dealing with Rapidly Changing Data	185
8.6	Experimental Results	186
8.7	Adaptive Data Mining Using Hybrid Model of Rough Sets and Two-Phase GAs	189
8.8	Mathematical Model of Attributes (MMA)	190
8.9	Two Phase Genetic Algorithms	191
8.10	Summary	194
	References	194
<b>9</b>	<b>Hashing the Web for Better Reorganization</b>	197
9.1	Introduction	197
	9.1.1 Frequent Items and Association Rules	198
9.2	Related Work	200
9.3	Web Usage Mining and Web Reorganization Model	200
9.4	Problem Definition	202
9.5	Algorithms	202
	9.5.1 Classification of Pages	206
9.6	Pre-processing	206
9.7	Example	208
9.8	Performance Analysis	210
9.9	Summary	214
	References	214
<b>10</b>	<b>Algorithms for Web Personalization</b>	217
10.1	Introduction	217
10.2	Overview	219
10.3	Data Structures	219
10.4	Algorithm	221
10.5	Performance Analysis	223
10.6	Summary	229
	References	229

<b>11 Classifying Clustered Webpages for Effective Personalization</b> .....	231
11.1 Introduction .....	231
11.2 Related Work .....	232
11.3 Proposed System .....	233
11.4 Example .....	237
11.5 Algorithm II: Naïve Bayesian Probabilistic Model.....	239
11.6 Performance Analysis .....	241
11.7 Summary.....	246
References .....	247
<b>12 Mining Top - k Ranked Webpages Using SA and GA</b> ....	249
12.1 Introduction .....	249
12.2 Algorithm <i>TkRSAGA</i> .....	252
12.3 Performance Analysis .....	253
12.4 Summary.....	258
References .....	258
<b>13 A Semantic Approach for Mining Biological Databases</b> .....	259
13.1 Introduction .....	259
13.2 Understanding the Nature of Biological Data .....	260
13.3 Related Work .....	262
13.4 Problem Definition .....	263
13.5 Identifying Indexing Technique .....	263
13.6 LSI Model .....	265
13.7 Search Optimization Using GAs .....	266
13.8 Proposed Algorithm.....	267
13.9 Performance Analysis .....	268
13.10 Summary .....	277
References .....	277
<b>14 Probabilistic Approach for DNA Compression</b> .....	279
14.1 Introduction .....	279
14.2 Probability Model .....	281
14.3 Algorithm .....	284
14.4 Optimization of $P'$ .....	285
14.5 An Example .....	286
14.6 Performance Analysis .....	287
14.7 Summary.....	288
References .....	288

<b>15 Non-repetitive DNA Compression Using Memoization . . .</b>	291
15.1 Introduction . . . . .	291
15.2 Related Work . . . . .	293
15.3 Algorithm . . . . .	294
15.4 Experimental Results . . . . .	298
15.5 Summary . . . . .	300
References . . . . .	300
<b>16 Exploring Structurally Similar Protein Sequence</b>	
<b>Motifs . . . . .</b>	303
16.1 Introduction . . . . .	303
16.2 Related Work . . . . .	305
16.3 Motifs in Protein Sequences . . . . .	305
16.4 Algorithm . . . . .	307
16.5 Experimental Setup . . . . .	308
16.6 Experimental Results . . . . .	310
16.7 Summary . . . . .	317
References . . . . .	317
<b>17 Matching Techniques in Genomic Sequences for Motif</b>	
<b>Searching . . . . .</b>	319
17.1 Overview . . . . .	319
17.2 Related Work . . . . .	320
17.3 Introduction . . . . .	321
17.4 Alternative Storage and Retrieval Technique . . . . .	323
17.5 Experimental Setup and Results . . . . .	327
17.6 Summary . . . . .	329
References . . . . .	330
<b>18 Merge Based Genetic Algorithm for Motif Discovery . . . .</b>	331
18.1 Introduction . . . . .	331
18.2 Related Work . . . . .	334
18.3 Algorithm . . . . .	334
18.4 Experimental Setup . . . . .	337
18.5 Performance Analysis . . . . .	339
18.6 Summary . . . . .	340
References . . . . .	340