

Contents

1	Introduction	1
1.1	Background of Big Data	1
1.2	Concepts of Data Science	3
1.3	Machine Learning	4
1.4	Granular Computing	6
1.5	Chapters Overview	7
	References	8
2	Traditional Machine Learning	11
2.1	Supervised Learning	11
2.2	Heuristic Learning	12
2.3	Single-Task Learning	14
2.4	Discriminative Learning	15
2.5	Random Data Partitioning	17
2.6	General Issues	17
2.7	Impacts from Big Data	19
	References	21
3	Semi-supervised Learning Through Machine Based Labelling	23
3.1	Overview of Semi-supervised Learning	23
3.2	Granular Framework of Learning	24
3.3	Discussion	26
	References	27
4	Nature Inspired Semi-heuristic Learning	29
4.1	Overview of Semi-heuristic Learning	29
4.2	Granular Framework of Learning	32
4.3	Discussion	34
	References	36

5	Fuzzy Classification Through Generative Multi-task Learning	37
5.1	Overview of Generative Multi-task Learning	37
5.2	Concepts of Fuzzy Classification	37
5.3	Granular Framework of Learning	41
5.4	Discussion	43
	References	46
6	Multi-granularity Semi-random Data Partitioning	49
6.1	Overview of Semi-random Data Partitioning	49
6.2	Granular Framework of Learning	50
6.3	Discussion	53
	References	65
7	Multi-granularity Rule Learning	67
7.1	Overview of Rule Learning	67
7.2	Granular Framework of Learning	72
7.3	Discussion	73
	References	76
8	Case Studies	77
8.1	Biomedical Data Processing	77
8.2	Sentiment Analysis	81
	References	88
9	Conclusion	89
9.1	Scientific Aspects	89
9.2	Philosophical Aspects	93
9.3	Further Directions	96
	References	99
	Appendix A: Results on Generative Multi-task Classification	101
	Appendix B: Results on Random Data Partitioning	105
	Glossary	111

Granular Computing Based Machine Learning
A Big Data Processing Approach

Liu, H.; Cocea, M.

2018, XV, 113 p. 27 illus., 19 illus. in color., Hardcover

ISBN: 978-3-319-70057-1