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Nota di contenuto	SELF-ADAPTIVE SYSTEMS FOR MACHINE INTELLIGENCE; CONTENTS; Preface; Acknowledgments; 1 Introduction; 1.1 The Machine Intelligence Research; 1.2 The Two-Fold Objectives: Data-Driven and Biologically Inspired Approaches; 1.3 How to Read This Book; 1.3.1 Part I: Data-Driven Approaches for Machine Intelligence (Chapters 2, 3, and 4); 1.3.2 Part II: Biologically-Inspired Approaches for Machine Intelligence (Chapters 4, 5, and 6); 1.4 Summary and Further Reading; References; 2 Incremental Learning; 2.1 Introduction; 2.2 Problem Foundation; 2.3 An Adaptive Incremental Learning Framework 2.4 Design of the Mapping Function2.4.1 Mapping Function Based on Euclidean Distance; 2.4.2 Mapping Function Based on Regression Learning Model; 2.4.3 Mapping Function Based on Online Value System; 2.4.3.1 A Three-Curve Fitting (TCF) Technique; 2.4.3.2 System-Level

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 2.5.2.1 Data Set Characteristic and System Configuration  
 2.5.2.2 Simulation Results; 2.6 Summary; References; 3 Imbalanced Learning; 3.1 Introduction; 3.2 The Nature of Imbalanced Learning; 3.3 Solutions for Imbalanced Learning; 3.3.1 Sampling Methods for Imbalanced Learning; 3.3.1.1 Random Oversampling and Undersampling; 3.3.1.2 Informed Undersampling; 3.3.1.3 Synthetic Sampling with Data Generation; 3.3.1.4 Adaptive Synthetic Sampling; 3.3.1.5 Sampling with Data Cleaning Techniques; 3.3.1.6 Cluster-Based Sampling Method; 3.3.1.7 Integration of Sampling and Boosting  
 3.3.2 Cost-Sensitive Methods for Imbalanced Learning  
 3.3.2.1 Cost-Sensitive Learning Framework; 3.3.2.2 Cost-Sensitive Data Space Weighting with Adaptive Boosting; 3.3.2.3 Cost-Sensitive Decision Trees; 3.3.2.4 Cost-Sensitive Neural Networks; 3.3.3 Kernel-Based Methods for Imbalanced Learning; 3.3.3.1 Kernel-Based Learning Framework; 3.3.3.2 Integration of Kernel Methods with Sampling Methods; 3.3.3.3 Kernel Modification Methods for Imbalanced Learning; 3.3.4 Active Learning Methods for Imbalanced Learning; 3.3.5 Additional Methods for Imbalanced Learning  
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 4.2.4 Double-Fault Measure

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## Sommario/riassunto

"This book will advance the understanding and application of self-adaptive intelligent systems; therefore it will potentially benefit the long-term goal of replicating certain levels of brain-like intelligence in complex and networked engineering systems. It will provide new approaches for adaptive systems within uncertain environments. This will provide an opportunity to evaluate the strengths and weaknesses of the current state-of-the-art of knowledge, give rise to new research directions, and educate future professionals in this domain. Self-adaptive intelligent systems have wide applications from military security systems to civilian daily life. In this book, different application problems, including pattern recognition, classification, image recovery, and sequence learning, will be presented to show the capability of the proposed systems in learning, memory, and prediction. Therefore, this book will also provide potential new solutions to many real-world applications"--

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