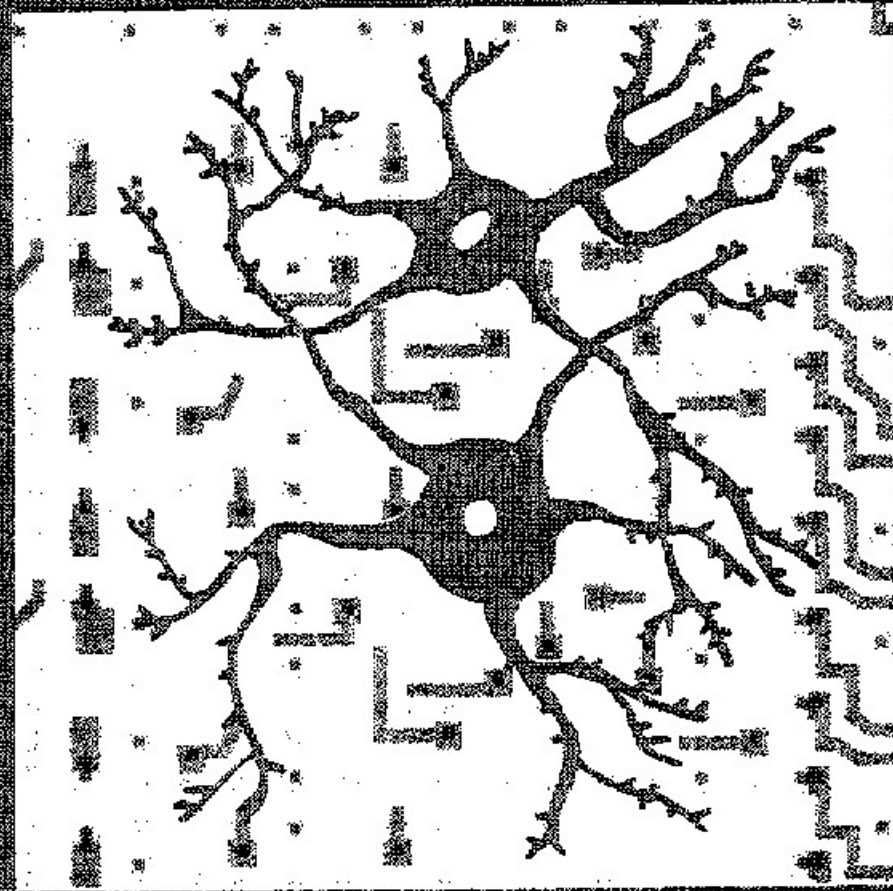


MACHINE LEARNING

An Artificial Intelligence Approach

Volume III



Yves Kodratoff
Ryszard Michalski

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PREFACE

As the field of machine learning enjoys unprecedented growth and attracts many new researchers, there is a need for regular summaries and comprehensive reviews of its progress. This volume is a sequel to the previous volumes of the same title: Volume I appeared in 1983, Volume II in 1986. Volume III presents a sample of machine learning research representative of the period between 1986 and 1989.

One noteworthy characteristic of that period is that a much larger portion of research has been done outside of the United States, particularly in Europe. To reflect this, Volume III contains a significant number of non-U.S.A contributions. In addition, this volume covers topics not covered at all or covered only sparsely by the previous volumes, such as connectionist learning methods, genetic algorithms, and computational learning theory.

To provide a comprehensive representation of research, this volume has drawn on several sources. Most of the chapters are directly invited contributions by leading researchers in the field. Several chapters are updated and extended versions of invited presentations at the International Meeting on Advances in Learning (IMAL) held in Les Arcs, France in July 1986. These chapters are accompanied by commentaries prepared by the discussants at the meeting. Finally, few chapters are based on papers selected from among those presented at the 4th and 5th International Machine Learning conferences, held at the University of California at Irvine in June 1987 and the University of Michigan at Ann Arbor in June 1988, respectively.

The bibliography at the end of the book provides a comprehensive guide to these and related publications. It contains over 1000 entries and refers to publications in all major ML subareas for the period 1985–1989. All the entries are indexed, using a classification of ML publications into 17 categories.

For more complete coverage of the progress of the field, the reader is referred to relevant journals, in particular, *Machine Learning*, *Artificial Intelligence*, and *AI Magazine*, and to the proceedings of various conferences. Among the most relevant conferences are international machine learning conferences [T87, T88, T89], the

meetings of the American Association for Artificial Intelligence [AAAI T86, T87 and T88], workshops on computational learning theory [COLT T88 and T89], the workshop on explanation-based learning [T88], international conferences on genetic algorithms [T87 and T89], conferences on neural nets, the European Working Sessions on Learning [EWSL T87, T88 and T89], the European congresses on artificial intelligence [ECAI T86 and T88], the International Joint Conferences on Artificial Intelligence [IJCAI T87 and T89], and International Workshop on Tools for Artificial Intelligence (1989).

It is the editors pleasant duty to thank all those who helped in the preparation of this book. Our deep gratitude goes to all the contributors for their efforts to write the chapters in a highly comprehensive and easy-to-read manner. We are very grateful to the reviewers, whose help was indispensable. We wish to thank Shirley Jowell, Production Manager for Morgan Kaufmann, for her contribution to this book.

Special thanks go to DIGITAL-EUROPE and the London office of the U.S. Army. These organizations sponsored IMAL, which gave the first impetus this volume. The editors also acknowledge the help and technical support extended to them by the faculty, staff, and research assistants of the Center for Artificial Intelligence and the Department of Computer Science at George Mason University and by the French National Research Center (CNRS).

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