Book Review

Introduction to Machine Learning

by Ethem Alpaydin

The MIT Press Essential Knowledge series

The MIT Press

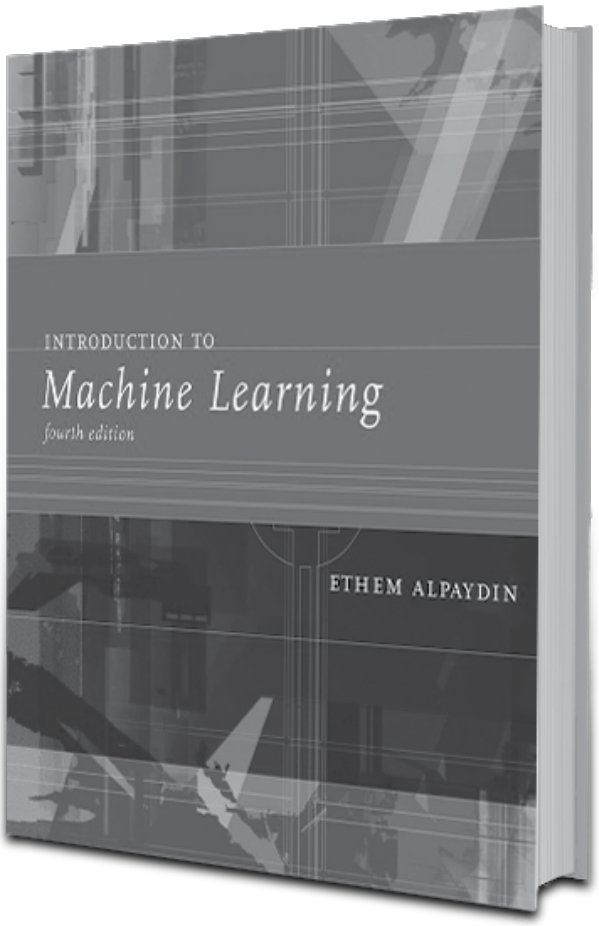
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About the Author

Ethem ALPAYDIN is Professor in the Department of Computer Engineering, Özyeğin University, Istanbul Turkey and is a member of the Science Academy, Istanbul. He received his PhD from the Ecole Polytechnique Fédérale de Lausanne, Switzerland in 1990 and was a postdoc at the International Computer Science Institute, Berkeley in 1991. He was a Fulbright scholar in 1997. He was a visiting researcher at MIT, USA in 1994, IDIAP, Switzerland in 1998 and TU Delft, The Netherlands in 2014.

Appreciation and Critique

The text deals with a quiet revolution that has been taking place in computer science for the last two decades. In this book, machine learning expert Ethem Alpaydin offers a concise overview of the subject for the general reader, describing new technologies, its evolution, explaining important learning algorithms, and presenting example applications. This is a revised fourth edition of comprehensive machine learning, book offers new coverage of recent advances in the field of technology machine learning in both theory and practice. This book includes development in deep learning and neural networks. This book talk about the programs that learn to recognize people from their faces, understand speech, drive a car, or recommend which movie to watch—with promises to do more in the future. It is the basis of the new approach in computing where we do not write programs but collect data; the idea is to learn the algorithms for the tasks automatically from data. As computing devices grow more ubiquitous, a larger part of our lives and work is recorded digitally, and as "Big Data" has gotten bigger, the theory of machine learning—the foundation of efforts to process that data into knowledge—has also advanced.

The author has considered various methods of representing and dealing with machine learning, covered a broad series of topics not usually included in introductory machine learning texts. The fourth edition covers a new chapter on deep learning that discusses various aspects of training, regularizing and structuring deep neural networks. The author has also included supervised learning, parametric methods, Bayesion decision theory, semiparametric methods, non para metric methods, multivariate analysis, hidden Markov models, reinforcement learning, kernel machines, Bayesian estimation, statistical testing and graphical models in this fourth edition.

Deep neural networks such as convolutional and generative adversarial networks is covered in detail. New materials in the chapter on reinforcement learning that includes the use of deep networks, the policy gradient methods and deep reinforcement learning is included. In the chapter on multilayer perceptions on auto encoders, discussion on the popular method of

dimensionally reduction. New appendixes offer background material on linear algebra and optimization.

End of the chapter exercises help readers to apply the concepts learned and discussed. This revised fourth edition is a comprehensive textbook with in depth coverage of the recent advances in machine learning in deep learning and neural networks.

Finally, this book explores and gives broad overview of different algorithms and methodologies available in the machine learning field. Each chapter reads almost independently. The fourth edition is more recent, more detailed and slightly more math intensive.

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