PATTERN RECOGNITION AND MACHINE LEARNING

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As the author writes in the preface of the book, pattern recognition has its origin in engineering, whereas machine learning grew out of computer science. However, these activities can be viewed as two facets of the same field, and they have undergone substantial development over the past years.

Bayesian methods are widely used, while graphical models have emerged as a general framework for describing and applying probabilistic models. Similarly new models based on kernels have had significant impact on both algorithms and applications.

This textbook reflects these recent developments while providing a comprehensive introduction to the fields of pattern recognition and machine learning. It is aimed at advanced undergraduate or first year PhD students, as well as researchers and practitioners. It can be consider as an introductory course to the subject.

The first four chapters are devoted to the concepts of Probability and Statistics that are needed for reading the rest of the book, so we can imagine that the speed is high in order to get from zero to infinity. I believe that it is better to study the book after a previous course on Probability and Statistics. On the other hand, a basic knowledge of linear algebra and multivariate calculus is assumed.

The other chapters give to a classic probabilist or statistician a point of view on some applications that are very interesting but far from his usual world. In all the text the mathematical aspects are at the second level in relation with the ideas and intuitions that the author wants to communicate.

The book is supported by a great deal of additional material, including lecture slides as well as the complete set of figures used in it, and the reader is encouraged to visit the book web site for the latest information. So it can be very useful for a course or a talk about the subject.

The exercises that appear at the end of the chapters form an important component of the book. They reinforce or generalize concepts explained in the text, and are graded according to difficulty. The solutions to the exercises considered by the author to amplify key points or fill in important details can be found also as a PDF file in the web book site.

This book focuses on concepts and principles and not on the use of key algorithms for appropriate data sets. The author announces a companion volume in 2008, which will deal with practical aspects of pattern recognition and machine learning. It will be accompanied by Matlab software, implementing most of the algorithms discussed in this text. This second part is necessary to complete the gap of the present volume.

Though this book has to be considered a first contact with these interesting fields, the list of references is wide enough to satisfy our curiosity.

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