BOOK REVIEW

Essential Principles for Autonomous Robotics

Henry Hexmoor
Synthesis Lectures on Artificial Intelligence and Machine Learning
Morgan & Claypool Publishers
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3 parts; 15 chapters. 141 pages. 2013 edition

Books have different characteristics and functions. Some project the new progress in domains, some treat the subject matter fundamentally while others try to achieve comprehensiveness. This compendium on Robotics try to carry out the all the above roles specified.

Robots are made to move on directions based on commands. The concept of movement is treated with basic logics and principles which lead the new readers to understand the basic principle of robotics. The author has given good illustrations so that the readers gain a comprehensive understanding of it. The second chapter focus the behaviour of robotics with a neat classification of them. In the next chapter the architectures essential for robotics designs are described.

Affective computing is gaining significance which is based on emotions. Even this chapter five is brief it lists the required concepts in affective computing. The next chapter on Sensors provide a few available sensors which are described using illustrations.

The electromagnetic principle behind robotics is manipulators which are required to perform repetitive actions. The principles behind the manipulators are given not in the beginning of this chapter rather after the discussion of the few types of robots such as pick and place robots! With this chapter the first part presents the preliminaries.

In the second part the first discussion is on Mobility which determines the success of robots. In this part we can read a very brief chapter on Potential Fields followed by Roadmaps. The components such as geometry and grids are illustrated in this chapter. The navigation supported by algorithms is explained in the next chapter. This part seems to be highly condensed which needs further description.

In the last part the first chapter speaks about the Multi-Robotics Phenomena. The self organizing system is the core for the future research in swarm intelligence. The swarm is illustrated with a brief description in the chapter. In the next chapter we have human-robot interaction which list the initial progress in this direction coupled with a discussion on multimodal interaction. The last two chapters on fuzzy control and game theory are the supportive units but work as essential sub-domains in robotics. The 15th chapter on Applications treat a new kind of illustrations. This book has an extensive bibliography at the end to assist the users for further referencing.

The book even brief, offers good focus on robotics. The readers can use it to gain basic understanding as the illustrations are elegant!

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Book Review

Jan Rauch
Observational Calculi and Association Rules
Studies in Computational Intelligence Series no. 469
Springer, Heidelberg, New York, Dordrecht, London
ISBN: 978-3-643-11736-7
16 Chapters. 296 pages

Association Rules perhaps have significant impact in data mining than any other technique. In the last couple of years we have been encountering with many newer specific mining techniques and methods. Besides, we have mining of atomic level concepts to gain understanding of the data we have.

Jan Rauch took the mathematical formulation, the Observational Calculi which was formulated by *Petr Hajek* and *Tomas Havranek* to understand how the association rules can able to support the scientific hypotheses verification. He developed a theory based on the statement, "*if we accept theoretical assumptions and verify a particular statement about the observed data, we accept a conclusion-a theoretical statement*". Statistical techniques are warranted to make the theoretical assumptions to reality. Based on this concept, he produced the documentation on calculi association rules.

This book has four parts with 16 chapters which spread into a very large number of sub-sections. The Part I discusses the logical calculi behind the association rules. A basic chapter on the Data Matrices forms a component in this section. The core of the association rules is the Boolean attributes which are derived from an analysis of data matrix. The data matrices are explained using good examples where transactions are presented. The interpretations of Boolean attributes are given in the subsequent chapter. The 4ft quantifiers are described with properties and lemmas. The theorems, implications and possible extensions are outlined with good amount of descriptions in the next couple of chapters which leads the young researchers to gain understanding of the quantifiers.

There is an exclusive chapter on deduction rules in the calculi of association rules in this book that discuss the properties with adequate number of theorems. The GUHA methods were introduced with the intention of framing formulas for observational calculi. The GUHA methods are elaborately discussed with the SD4ft-Miner and Ac4ft miner for mine which enable to form strong measures for association rules in an exclusive chapter.

The book is supplemented with an extensive bibliography, references used and glossary. The author could have given possible applications for different domains which is required.

I found this book as the useful addition to the stock of knowledge on data mining. The author has made it clear that the present research community needs to look at not only journal literature but new books on specific themes for generating valuable research. This is a compendium to the data mining researchers on newer tasks.

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