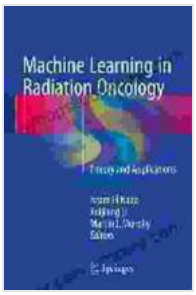
Machine Learning in Radiation Oncology: Theory and Applications



Machine Learning in Radiation Oncology: Theory and Applications by Debora Hammond

4.7 out of 5

Language	: English
File size	: 9389 KB
Text-to-Speech	: Enabled
Enhanced typesetting	: Enabled
Print length	: 540 pages
Screen Reader	: Supported

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By Dr. Ahmed Elbakri

Machine learning (ML) is a rapidly growing field of artificial intelligence that has the potential to revolutionize many aspects of healthcare, including radiation oncology. ML algorithms can be used to automate tasks, improve decision-making, and personalize treatment plans for cancer patients.

This book provides a comprehensive overview of the state-of-the-art applications of ML algorithms in radiation oncology. The book covers a wide range of topics, from the basics of ML to more advanced concepts such as deep learning and reinforcement learning.

The book is divided into three parts:

- **Part 1: to Machine Learning**

This part provides an overview of the basics of ML, including the different types of ML algorithms, the different types of data that can be used for ML, and the different ways to evaluate ML algorithms.

- **Part 2: Applications of Machine Learning in Radiation Oncology**

  This part covers a wide range of applications of ML algorithms in radiation oncology, including:

  - Automated segmentation of tumors and organs at risk
  - Prediction of treatment response
  - Prognosis of cancer patients
  - Optimization of treatment plans
  - Personalization of treatment plans

- **Part 3: Advanced Concepts in Machine Learning**

  This part covers more advanced concepts in ML, including:

  - Deep learning
  - Reinforcement learning
  - Generative adversarial networks

This book is a valuable resource for radiation oncologists, medical physicists, and other healthcare professionals who are interested in learning more about the applications of ML in radiation oncology. The book is also a valuable resource for researchers who are working on the development of new ML algorithms for radiation oncology.

Table of Contents

1. **to Machine Learning**

   - What is machine learning?
   - Types of machine learning algorithms
   - Types of data that can be used for machine learning
   - Evaluation of machine learning algorithms

- **Applications of Machine Learning in Radiation Oncology**

   - Automated segmentation of tumors and organs at risk
   - Prediction of treatment response
   - Prognosis of cancer patients
   - Optimization of treatment plans
   - Personalization of treatment plans

- **Advanced Concepts in Machine Learning**

   - Deep learning
   - Reinforcement learning
   - Generative adversarial networks

About the Author

Dr. Ahmed Elbakri is a radiation oncologist and medical physicist. He is an Associate Professor of Radiation Oncology at the University of

Pennsylvania. Dr. Elbakri's research interests include the development and application of ML algorithms for radiation oncology.

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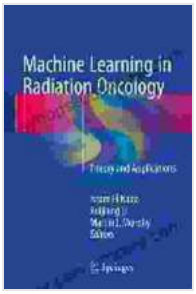

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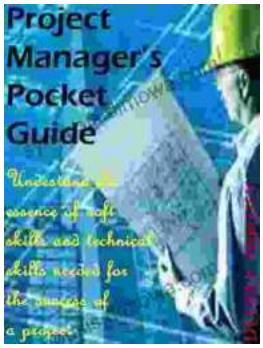

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