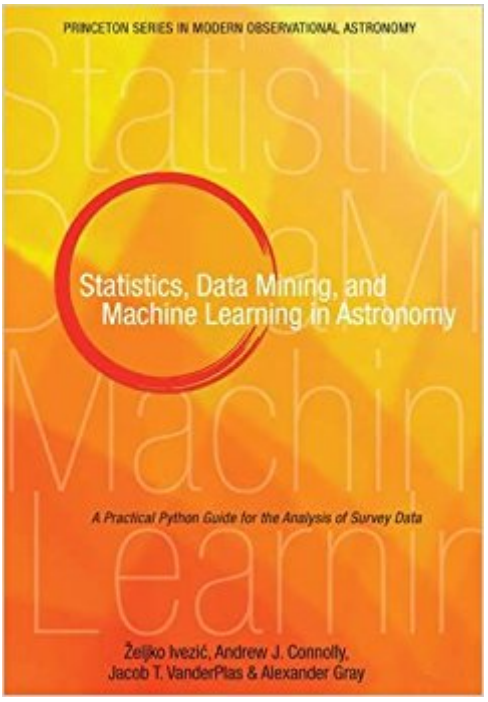
Statistics, Data Mining, And Machine Learning In Astronomy: A Practical Python Guide For The Analysis Of Survey Data (Princeton Series In Modern Observational Astronomy)



Synopsis

As telescopes, detectors, and computers grow ever more powerful, the volume of data at the disposal of astronomers and astrophysicists will enter the petabyte domain, providing accurate measurements for billions of celestial objects. This book provides a comprehensive and accessible introduction to the cutting-edge statistical methods needed to efficiently analyze complex data sets from astronomical surveys such as the Panoramic Survey Telescope and Rapid Response System, the Dark Energy Survey, and the upcoming Large Synoptic Survey Telescope. It serves as a practical handbook for graduate students and advanced undergraduates in physics and astronomy, and as an indispensable reference for researchers. Statistics, Data Mining, and Machine Learning in Astronomy presents a wealth of practical analysis problems, evaluates techniques for solving them, and explains how to use various approaches for different types and sizes of data sets. For all applications described in the book, Python code and example data sets are provided. The supporting data sets have been carefully selected from contemporary astronomical surveys (for example, the Sloan Digital Sky Survey) and are easy to download and use. The accompanying Python code is publicly available, well documented, and follows uniform coding standards. Together, the data sets and code enable readers to reproduce all the figures and examples, evaluate the methods, and adapt them to their own fields of interest. Describes the most useful statistical and data-mining methods for extracting knowledge from huge and complex astronomical data sets Features real-world data sets from contemporary astronomical surveys Uses a freely available Python codebase throughout Ideal for students and working astronomers

Book Information

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Customer Reviews

Winner of the 2016 IAA Outstanding Publication Award, International Astrostatistics Association"Ivezic and colleagues at the University of Washington and the Georgia Institute of Technology have written a comprehensive, accessible, well-thought-out introduction to the new and burgeoning field of astrostatistics. . . . The authors provide another valuable service by discussing how to access data from key astronomical research programs."--Choice"A substantial work that can be of value to students and scientists interesting in mining the vast amount of astronomical data collected to date. . . . A well-prepared introduction to this material. . . . If data mining and machine learning fall within your interest area, this text deserves a place on your shelf."--International Planetarium Society

"This comprehensive book is surely going to be regarded as one of the foremost texts in the new discipline of astrostatistics."--Joseph M. Hilbe, president of the International Astrostatistics Association"In the era of data-driven science, many students and researchers have faced a barrier to entry. Until now, they have lacked an effective tutorial introduction to the array of tools and code for data mining and statistical analysis. The comprehensive overview of techniques provided in this book, accompanied by a Python toolbox, free readers to explore and analyze the data rather than reinvent the wheel."--Tony Tyson, University of California, Davis"The authors are leading experts in the field who have utilized the techniques described here in their own very successful research. Statistics, Data Mining, and Machine Learning in Astronomy is a book that will become a key resource for the astronomy community."--Robert J. Hanisch, Space Telescope Science Institute

An excellent coverage of several methods and techniques used in astrophysics. I wish I’d had this book earlier in my graduate career.

Something that sets this book apart is how different numerical approaches to the same problem are compared. It’s often true that you have several methods to choose from, and the best choice depends on the character of your data or expected solution or computational resources. This book does a great job of summarizing tradeoffs in such decisions, and gives insight into making appropriate choices.

I am pretty disappointed with this book because i assumed that it was going to walk you through actually doing stats and ML on astronomical data sets. However, all of the codes in the book just show you how to use the astroML functions without using them on actually data sets. Instead the authors just make random variables then throw them into the functions... I would have much more appreciated the steps:1. Show and explain an astronomical dataset2. Do stats and ML on those datasets with a full explanation

I can’t find an "ask a question" link like other products on . I read one of the author’s blog posts on frequentist vs bayesian statistics and came here that way.This book looks interesting, but can anyone say what version of Python the code in the book is written for?

Statistics, Data Mining, and Machine Learning in Astronomy: A Practical Python Guide for the Analysis of Survey Data (Princeton Series in Modern Observational Astronomy) Python: The Complete Python Quickstart Guide (For Beginner’s) (Python, Python Programming, Python for Dummies, Python for Beginners) Python: Programming: Your Step By Step Guide To Easily Learn Python in 7 Days (Python for Beginners, Python Programming for Beginners, Learn Python, Python Language) Hacking with Python: Beginner’s Guide to Ethical Hacking, Basic Security, Penetration Testing, and Python Hacking (Python Programming, Hacking, Python Coding, Python and Hacking Book 3) PYTHON: PYTHON’S COMPANION, A STEP BY STEP GUIDE FOR BEGINNERS TO START CODING TODAY! (INCLUDES A 6 PAGE PRINTABLE CHEAT SHEET)(PYTHON FOR BEGINNERS, PYTHON FOR DUMMIES, PYTHON PROGRAMMING) Analytics: Data Science, Data Analysis and Predictive Analytics for Business (Algorithms, Business Intelligence, Statistical Analysis, Decision Analysis, Business Analytics, Data Mining, Big Data) Big Data For Business: Your Comprehensive Guide to Understand Data Science, Data Analytics and Data Mining to Boost More Growth and Improve Business - Data Analytics Book, Series 2 PYTHON: LEARN PYTHON in A Day and MASTER IT WELL. The Only Essential Book You Need To Start Programming in Python Now. Hands On Challenges INCLUDED! (Programming for Beginners, Python) Python Programming: Python Programming for Beginners, Python Programming for Intermediates, Python Programming for Advanced Discovering Knowledge in Data: An Introduction to Data Mining (Wiley Series on Methods and Applications in Data Mining) Data Mining: Practical Machine Learning Tools and Techniques (Morgan Kaufmann Series in Data Management Systems) Data Mining, Fourth Edition: Practical Machine Learning Tools and Techniques (Morgan Kaufmann Series in Data

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