Mastering SciPy

By Francisco J. Blanco-Silva

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About This Book

- Master the theory and algorithms behind numerical recipes and how they can be applied to real-world problems
- Learn to combine the most appropriate built-in functions from the SciPy stack by understanding the connection between the sources of your problem, volume of data, or computer architecture
- A comprehensive coverage of all the mathematical techniques needed to solvethe presented topics, with a discussion of the relevant algorithms built in the SciPy stack

Who This Book Is For

If you are a professional with a proficiency in Python and familiarity with IPython, this book is for you. Some basic knowledge of numerical methods in scientific computing would be helpful.

What You Will Learn

- Master relevant algorithms used in symbolic or numerical mathematics to address the approximation, interpolation, and optimization of scalar or multi-variate functions
- Develop different algorithms and strategies to effectively store and manipulate large matrices of data, with a view to solving various problems in numerical linear algebra
- Understand how to model physical problems with systems of differential equations and distinguish the factors that dictate the strategies to solve them numerically
- Perform statistical analysis, inference, data mining, and machine learning at higher level, and apply these to real-world problems
- Adapt valuable ideas in computational geometry like Delaunay triangulations, Voronoi diagrams, geometric query problems, or Bezier curves, and apply them to various engineering problems
- Familiarize yourself with different methods to represent and compress images, as well as techniques used in image processing, including edition, restoration, inpainting, segmentation, or feature recognition

In Detail

The SciPy stack is a collection of open source libraries of the powerful scripting language Python, together with its interactive shells. This environment offers a cutting-edge platform for numerical computation, programming, visualization and publishing, and is used by some of the world's leading mathematicians, scientists, and engineers.

This book goes beyond a mere description of the different built-in functions coded in the libraries from the SciPy stack. It presents you with a solid mathematical and computational background to help you identify the right tools for each problem in scientific computing and visualization.

You will gain an insight into the best practices with numerical methods depending on the amount or type of data, properties of the mathematical tools employed, or computer architecture, among other factors.

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Editorial Review

About the Author

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Francisco J. Blanco-Silva is the owner of a scientific consulting company called Tizona Scientific Solutions, a faculty member of the Department of Mathematics, and an associate member of the Interdisciplinary Mathematics Institute at the University of South Carolina. He obtained his formal training as an applied mathematician from Purdue University. He enjoys problem solving, learning, and teaching alike. Being an avid programmer and blogger, when it comes to writing, he relishes finding the common denominator among his passions and skills and making it available to everyone. He wrote the prequel to this book, Learning SciPy for Numerical and Scientific Computing, Packt Publishing, and coauthored Chapter 5 of the book, Modeling Nanoscale Imaging in Electron Microscopy, Springer.

Users Review

From reader reviews:

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