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Autore	Rojas Sergio J.G
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Nota di contenuto	Cover; Copyright; Credits; About the Authors; About the Reviewers; www.PacktPub.com; Table of Contents; Preface; Chapter 1: Introduction to SciPy; What is SciPy?; Installing SciPy; Installing SciPy on Mac OS X; Installing SciPy on Unix/Linux; Installing SciPy on Windows; Testing SciPy installation; SciPy organization; How to find documentation; Scientific visualization; How to open IPython Notebooks; Summary; Chapter 2: Working with the NumPy Array As a First Step to SciPy; Object essentials; Using datatype; Indexing and slicing arrays; The array object; Array conversions Shape selection/manipulationsObject calculations; Array routines; Routines to create arrays; Routines for the combination of two or more arrays; Routines for array manipulation; Routines to extract information from arrays; Summary; Chapter 3: SciPy for Linear Algebra; Vector creation; Vector operations; Addition/subtraction; Scalar/Dot product; Cross / Vector product - on three-dimensional space vectors; Creating a matrix; Matrix methods; Operations between matrices; Functions on matrices; Eigenvalue problems and matrix decompositions; Image compression via the singular value decomposition SolversSummary; Chapter 4: SciPy for Numerical Analysis; Evaluation of special functions; Convenience and test functions; Univariate

polynomials; The gamma function; The Riemann zeta function; Airy and Bairy functions; The Bessel and Struve functions; Other special functions; Interpolation; Regression; Optimization; Minimization; Roots; Integration; Exponential/logarithm integrals; Trigonometric and hyperbolic trigonometric integrals; Elliptic integrals; Gamma and beta integrals ; Numerical integration; Ordinary differential equations; Lorenz attractors; Summary
Chapter 5: SciPy for Signal ProcessingDiscrete Fourier Transforms; Signal construction; Filters; LTI system theory; Filter design; Window functions; Image interpolation; Morphology; Summary; Chapter 6: SciPy for Data Mining; Descriptive statistics; Distributions; Interval estimation, correlation measures, and statistical tests; Distribution fitting; Distances; Clustering; Vector quantization and k-means; Hierarchical clustering; Clustering mammals by their dentition; Summary; Chapter 7: SciPy for Computational Geometry; Structural model of oxides
A finite element solver for Laplace's equationSummary; Chapter 8: Interaction with Other Languages; Interaction with Fortran; Interaction with C/C++; Interaction with MATLAB/Octave; Summary; Index

Sommario/riassunto

This book targets programmers and scientists who have basic Python knowledge and who are keen to perform scientific and numerical computations with SciPy.