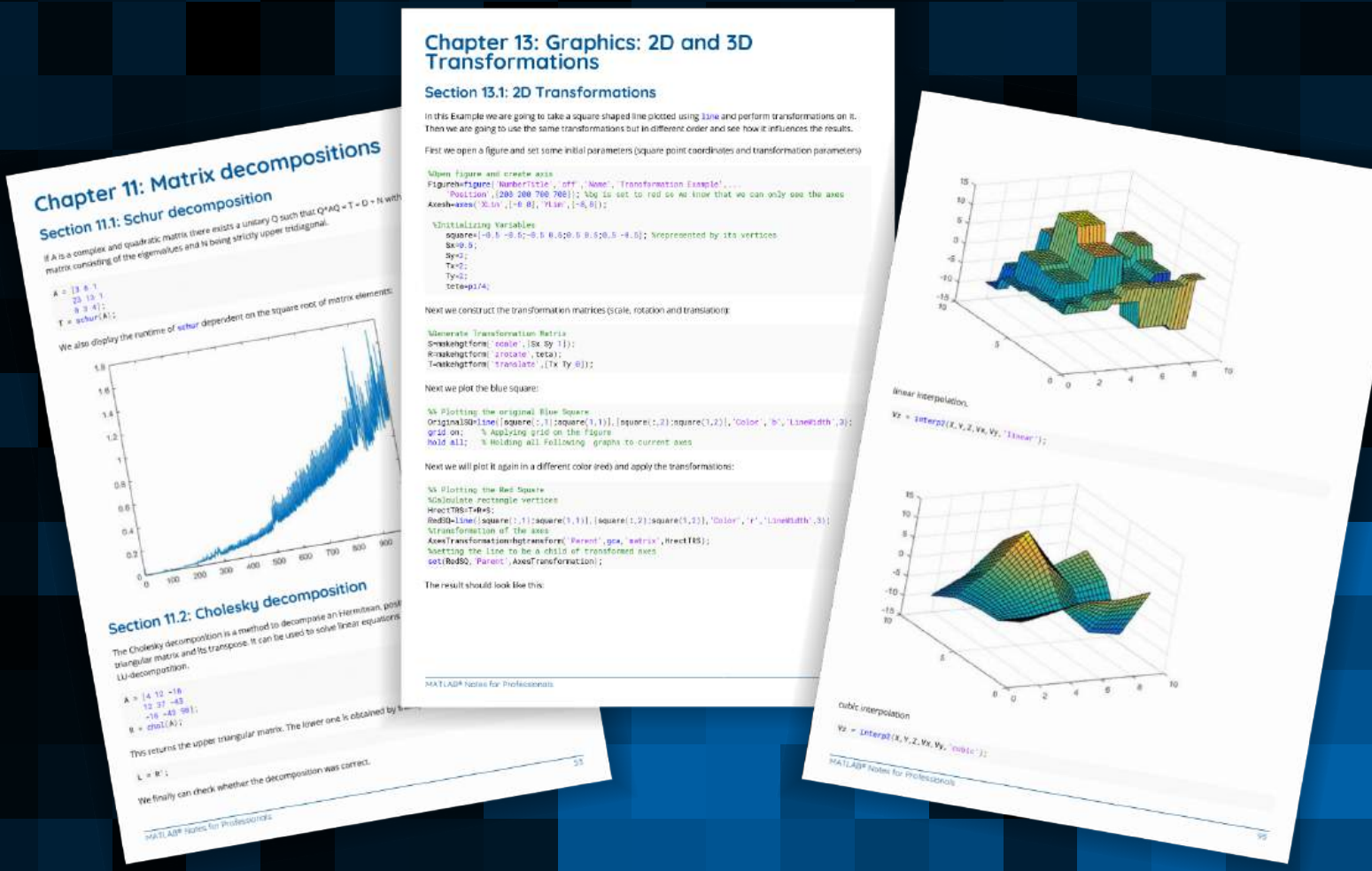
# MATLAB®

## Notes for Professionals




**100+ pages**

of professional hints and tricks

GoalKicker.com

Disclaim
This is an unofficial free book created for educational purposes an

# Contents


About ... 1
Chapter 1: Getting started with MATLAB Language ... 2
Section 1.1: Indexing matrices and arrays ... 3
Section 1.2: Anonymous functions and function handles ... 8
Section 1.3: Matrices and Arrays ... 11
Section 1.4: Cell arrays ... 13
Section 1.5: Hello World ... 14
Section 1.6: Scripts and Functions ... 14
Section 1.7: Helping yourself ... 16
Section 1.8: Data Types ... 16
Section 1.9: Reading Input & Writing Output ... 19
Chapter 2: Initializing Matrices or arrays ... 21
Section 2.1: Creating a matrix of 0s ... 21
Section 2.2: Creating a matrix of 1s ... 21
Section 2.3: Creating an identity matrix ... 21
Chapter 3: Conditions ... 22
Section 3.1: IF condition ... 22
Section 3.2: IF-ELSE condition ... 22
Section 3.3: IF-ELSEIF condition ... 23
Section 3.4: Nested conditions ... 24
Chapter 4: Functions ... 27
Section 4.1: nargin, nargout ... 27
Chapter 5: Set operations ... 29
Section 5.1: Elementary set operations ... 29
Chapter 6: Documenting functions ... 30
Section 6.1: Obtaining a function signature ... 30
Section 6.2: Simple Function Documentation ... 30
Section 6.3: Local Function Documentation ... 30
Section 6.4: Documenting a Function with an Example Script ... 31
Chapter 7: Using functions with logical output ... 34
Section 7.1: All and Any with empty arrays ... 34
Chapter 8: For loops ... 35
Section 8.1: Iterate over columns of matrix ... 35
Section 8.2: Notice: Weird same counter nested loops ... 35
Section 8.3: Iterate over elements of vector ... 36
Section 8.4: Nested Loops ... 37
Section 8.5: Loop 1 to n ... 38
Section 8.6: Loop over indexes ... 39
Chapter 9: Object-Oriented Programming ... 40
Section 9.1: Value vs Handle classes ... 40
Section 9.2: Constructors ... 40
Section 9.3: Defining a class ... 42
Section 9.4: Inheriting from classes and abstract classes ... 43
Chapter 10: Vectorization ... 47
Section 10.1: Use of bsxfun ... 47
Section 10.2: Implicit array expansion (broadcasting) [R2016b] ... 48

Section 10.3: Element-wise operations ... 49
Section 10.4: Logical Masking ... 50
Section 10.5: Sum, mean, prod & co ... 51
Section 10.6: Get the value of a function of two or more arguments ... 52
**Chapter 11: Matrix decompositions** ... 53
Section 11.1: Schur decomposition ... 53
Section 11.2: Cholesky decomposition ... 53
Section 11.3: QR decomposition ... 54
Section 11.4: LU decomposition ... 54
Section 11.5: Singular value decomposition ... 55
**Chapter 12: Graphics: 2D Line Plots** ... 56
Section 12.1: Split line with NaNs ... 56
Section 12.2: Multiple lines in a single plot ... 56
Section 12.3: Custom colour and line style orders ... 57
**Chapter 13: Graphics: 2D and 3D Transformations** ... 61
Section 13.1: 2D Transformations ... 61
**Chapter 14: Controlling Subplot coloring in MATLAB** ... 64
Section 14.1: How it's done ... 64
**Chapter 15: Image processing** ... 65
Section 15.1: Basic image I/O ... 65
Section 15.2: Retrieve Images from the Internet ... 65
Section 15.3: Filtering Using a 2D FFT ... 65
Section 15.4: Image Filtering ... 66
Section 15.5: Measuring Properties of Connected Regions ... 67
**Chapter 16: Drawing** ... 70
Section 16.1: Circles ... 70
Section 16.2: Arrows ... 71
Section 16.3: Ellipse ... 74
Section 16.4: Pseudo 4D plot ... 75
Section 16.5: Fast drawing ... 79
Section 16.6: Polygon(s) ... 80
**Chapter 17: Financial Applications** ... 82
Section 17.1: Random Walk ... 82
Section 17.2: Univariate Geometric Brownian Motion ... 82
**Chapter 18: Fourier Transforms and Inverse Fourier Transforms** ... 84
Section 18.1: Implement a simple Fourier Transform in MATLAB ... 84
Section 18.2: Images and multidimensional FTs ... 85
Section 18.3: Inverse Fourier Transforms ... 90
**Chapter 19: Ordinary Differential Equations (ODE) Solvers** ... 92
Section 19.1: Example for odeset ... 92
**Chapter 20: Interpolation with MATLAB** ... 94
Section 20.1: Piecewise interpolation 2 dimensional ... 94
Section 20.2: Piecewise interpolation 1 dimensional ... 96
Section 20.3: Polynomial interpolation ... 101
**Chapter 21: Integration** ... 105
Section 21.1: Integral, integral2, integral3 ... 105
**Chapter 22: Reading large files** ... 107
Section 22.1: textscan ... 107

End of ebook preview
Download the full PDF tutorial from the link below :

Click Here