Matlab and Image Processing with MATLAB

1 Beginnings (Jan. 21/28; Feb. 4/11))

General references:

MATLAB Primer (Sixth Edition)
Kermit Sigmon/Timothy A. Davis
Chapman & Hall/CRC, 2002

Mastering MATLAB7
(A Comprehensive Tutorial and Reference)
Duane Hanselman/Bruce Littlefield
Pearson/Prentice Hall, 2005

Matlab Guide
Desmond J. Higham/Nicholas J. Higham
SIAM, 2000

Graphics and GUIs with MATLAB (Third Edition)
Patrick Marchand/O. Thomas Holland
Chapman & Hall/CRC, 2003

Training from the Mathworks:
MATLAB Fundamentals and Programming Techniques

Matlab Programming for Engineers (2nd Edition)
Stephen J. Chapman
Brooks/Cole, 2002

Scientific Computing with MATLAB
Alfio Quarteroni/Fausto Saleri
Springer, 2003

MATLAB for Engineers Explained
Fredrik Gustafsson/Niclas Bergman
Springer, 2003

Essential MATLAB for Scientists and Engineers
(2nd Edition)
Brian D. Hahn
Elsevier, 2003

Introduction to Matlab7 for Engineers
William J. Palm III
McGraw-Hill, 2005

All the pdf files indicated below are available at
http://cda.psych.uiuc.edu/matlab_pdf

(a) Getting Started (getstart.pdf; handed out as hard copy in class)

1) Introduction
2) Matrices and Arrays
6) Desktoptools and Development Environment
Webinar: Introduction to MATLAB 7 (Live broadcast was Jan. 13, 2005)

Matlab pdfs:
matlab_env.pdf (desktoptools and development environment)
math.pdf
refbook.pdf
refbook2.pdf
refbook3.pdf

(b) Programming
4) Getting Started: Programming

Matlab pdfs:
matlab_prog.pdf
programming_tips.pdf
apiext.pdf
apiref.pdf

(c) Graphics
3) Getting Started: Graphics

Matlab pdf:
graphg.pdf

(d) Guis
5) Getting Started: Creating Graphical User Interfaces

Matlab pdf:
buildgui.pdf

2 Statistics/Curve Fitting (Feb. 18/25; March 4)

References:

Computational Statistics Handbook with MATLAB
Wendy L. Martinez/Angel R. Martinez
Chapman & Hall/CRC, 2002

Exploratory Data Analysis with MATLAB
Wendy L. Martinez/Angel R. Martinez
Chapman & Hall/CRC
2005

Training from the Mathworks:
Statistical Methods in MATLAB

(a) Webinar: Data Analysis with Curve Fitting and Statistics Toolboxes
Matlab pdfs:
stats.pdf (Matlab Statistics Toolbox Manual)
curvefit.pdf (Matlab Curve-Fitting Toolbox Manual)

(b) Webinar: Biomedical Statistics and Curve Fitting with MATLAB; New Statistics Tools in MATLAB and the Statistics Toolbox

(c) Webinar: MATLAB for Bioinformatics
Matlab pdfs:
bioinfo_ug.pdf
gads_tb.pdf (genetic algorithm)

3 Optimization (March 11/18)

References:

Applied Optimization with MATLAB Programming
P. Venkataraman
Wiley, 2002

Training from the Mathworks:
MATLAB Based Optimization Techniques

(a) Webinar: Applied Optimization Using Matlab
Matlab pdf:
optim_tb.pdf (Matlab Optimization Toolbox Manual)

(b) Case study in changing a Fortran Subroutine to Matlab:
The Dykstra-Karzmarz Fortran routine to MATLAB — (linear inequality constrained least-squares)

Case study in producing and calling Fortran dlls with MATLAB:
Fitting/Finding a unidimensional scaling for a proximity matrix

(c) Webinar: Genetic Algorithms and New Optimization Methods in MATLAB

4 Image Processing (April 1/8/15)

References:

Introduction to Digital Image Processing with MATLAB
Alasdair McAndrew
Thomson, 2004

Digital Image Processing Using Matlab
Rafael C. Gonzalez/Richard E. Woods/Steven L. Eddins
Pearson/Prentice Hall, 2004

Training from the Mathworks:
MATLAB for Image Processing

(a) Webinar: Image Processing Using MATLAB

Matlab pdf:
images_tb.pdf (Matlab Image Processing Toolbox Manual)

(b) Webinar: Biomedical Image Processing with MATLAB

(c) Webinar: Geospatial Data Analysis Using MATLAB

Matlab pdf:
map_ug.pdf (Matlab Mapping Toolbox Manual)

5 Other Things (April 22/29)

(a) fMRI-type Packages
SPM2
Lyngby
Brainstorm
EMEGS

(b) Various Related Toolboxes:
Neural Net (nnet.pdf)
Wavelet (wavelet_ug.pdf)
Spline (splines.pdf)
Virtual Reality (vr.pdf)
Symbolic (symbolic_tb.pdf)