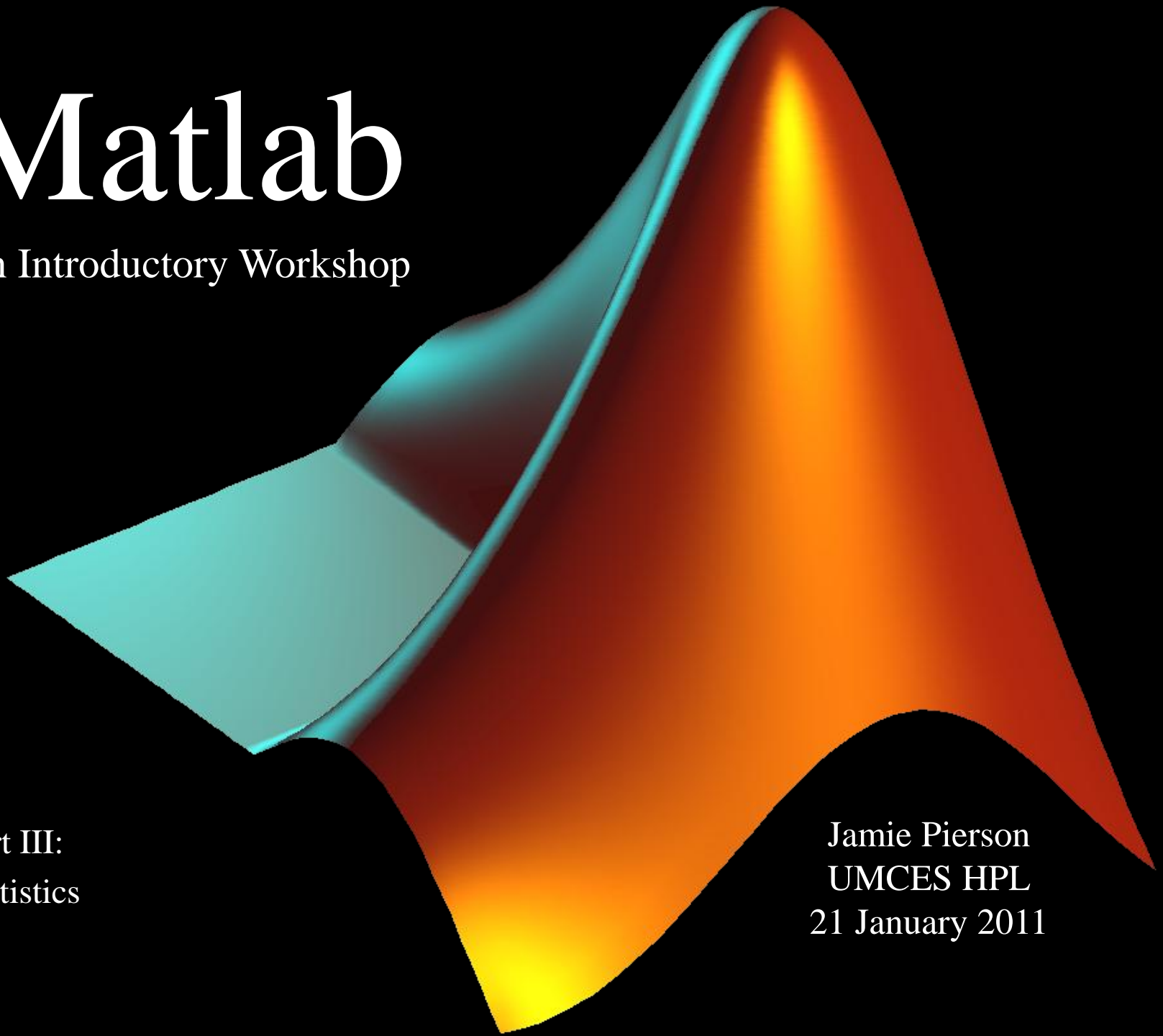


Matlab

An Introductory Workshop

Part III:
Statistics

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UMCES HPL
21 January 2011



Statistics in Matlab

Built-in Functions

Function	Description
max	Maximum value
mean	Average or mean value
median	Median value
min	Minimum value
mode	Most frequent value
std	Standard deviation
var	Variance

Statistic Toolbox

Function Categories	
File I/O	Data Organization
Descriptive Statistics	Statistical Visualization
Probability Distributions	Hypothesis Tests
Analysis of Variance	Regression Analysis
Multivariate Methods	Cluster Analysis
Model Assessment	Classification
Hidden Markov Models	Design of Experiments
Statistical Process Control	GUIs
Utilities	

Built-in: Descriptive Stats

The built-in descriptive statistics do not handle NaNs

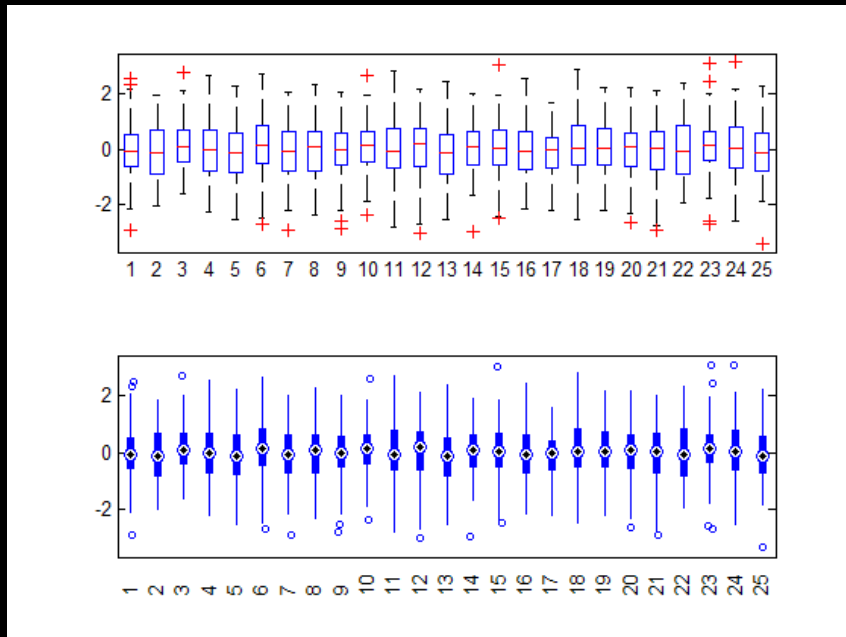
```
>> a=rand(1,5);  
>> [min(a) mean(a) max(a) std(a)]  
ans =  
    0.1270    0.6786    0.9134    0.3285  
>> a(3)=NaN;  
>> [min(a) mean(a) max(a) std(a)]  
ans =  
    0.6324    NaN    0.9134    NaN
```

Statistics Toolbox: Descriptive Stats

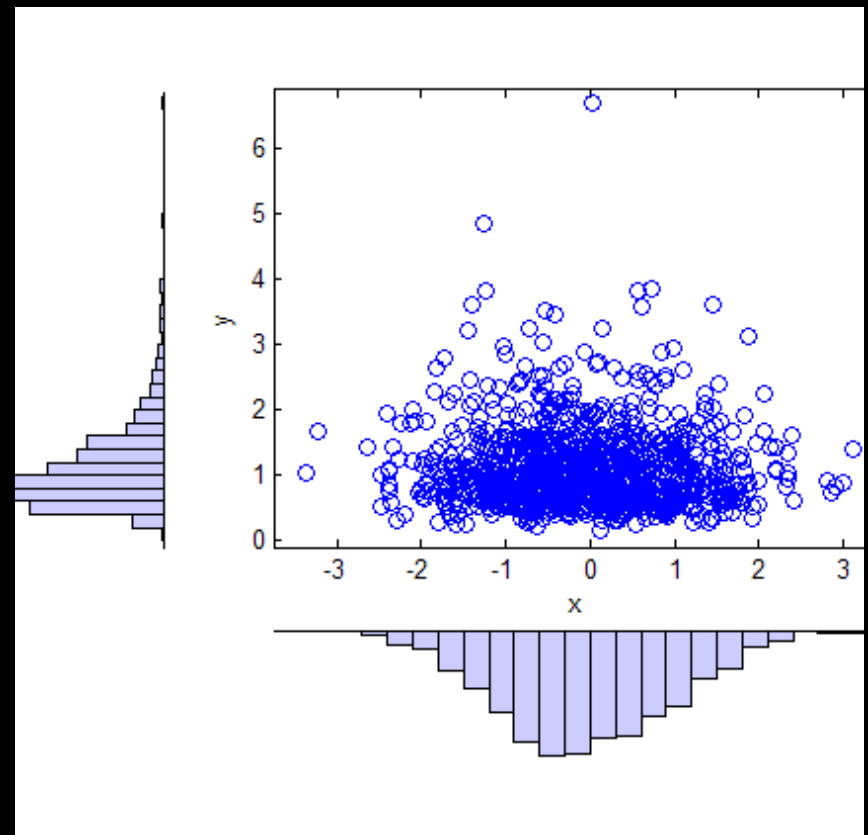
Funtions for blank values	
<code>nancov</code>	Covariance ignoring NaN values
<code>nanmax</code>	Maximum ignoring NaN values
<code>nanmean</code>	Mean ignoring NaN values
<code>nanmedian</code>	Median ignoring NaN values
<code>nanmin</code>	Minimum ignoring NaN values
<code>nanstd</code>	Standard deviation ignoring NaN values
<code>nansum</code>	Sum ignoring NaN values
<code>nanvar</code>	Variance ignoring NaN values

Statistics Toolbox: Specialized plots

boxplot

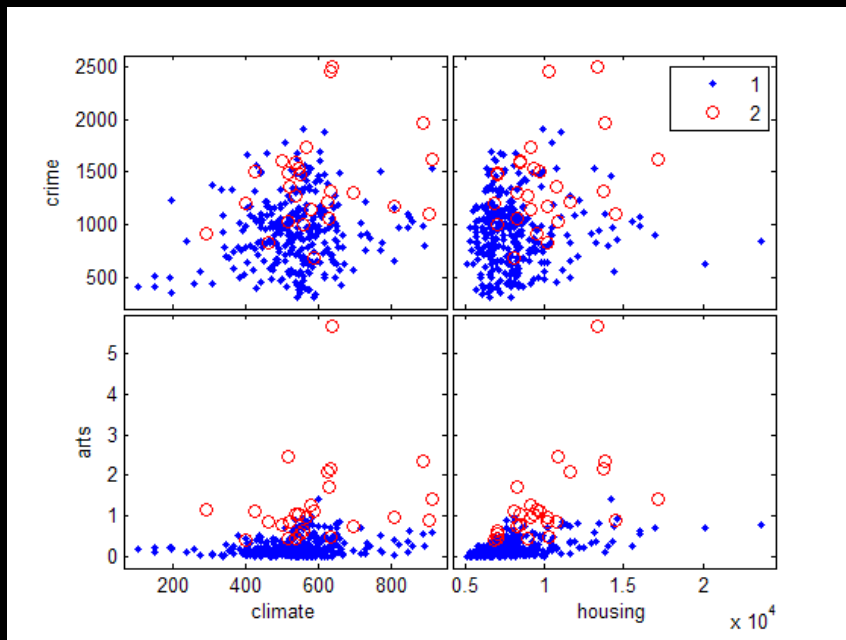


scatterhist

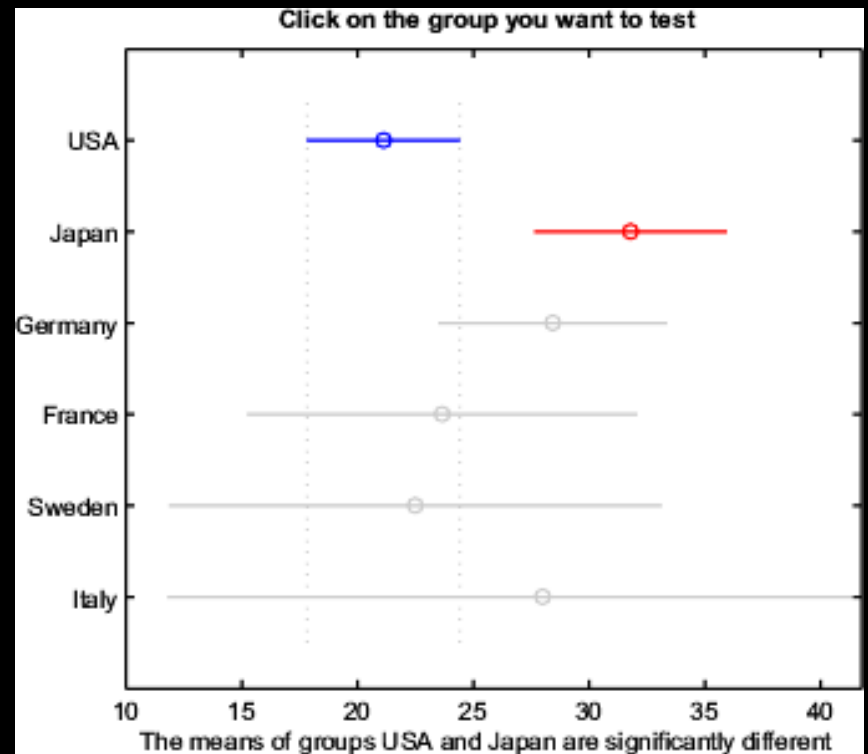


Statistics Toolbox: Specialized plots

`gplotmatrix`



`multcompare`



The Matlab File Exchange

901 files in the stats category

Search Results: category: "Statistics and Probability" - Mozilla Firefox

File Exchange | Answers | Newsgroup | Link Exchange | Blogs | Contest | MathWorks.com

Search: MATLAB Central

File Exchange

Search Files: category: "Statistics and Probability"

View All files by: Most Recent | Most Downloaded

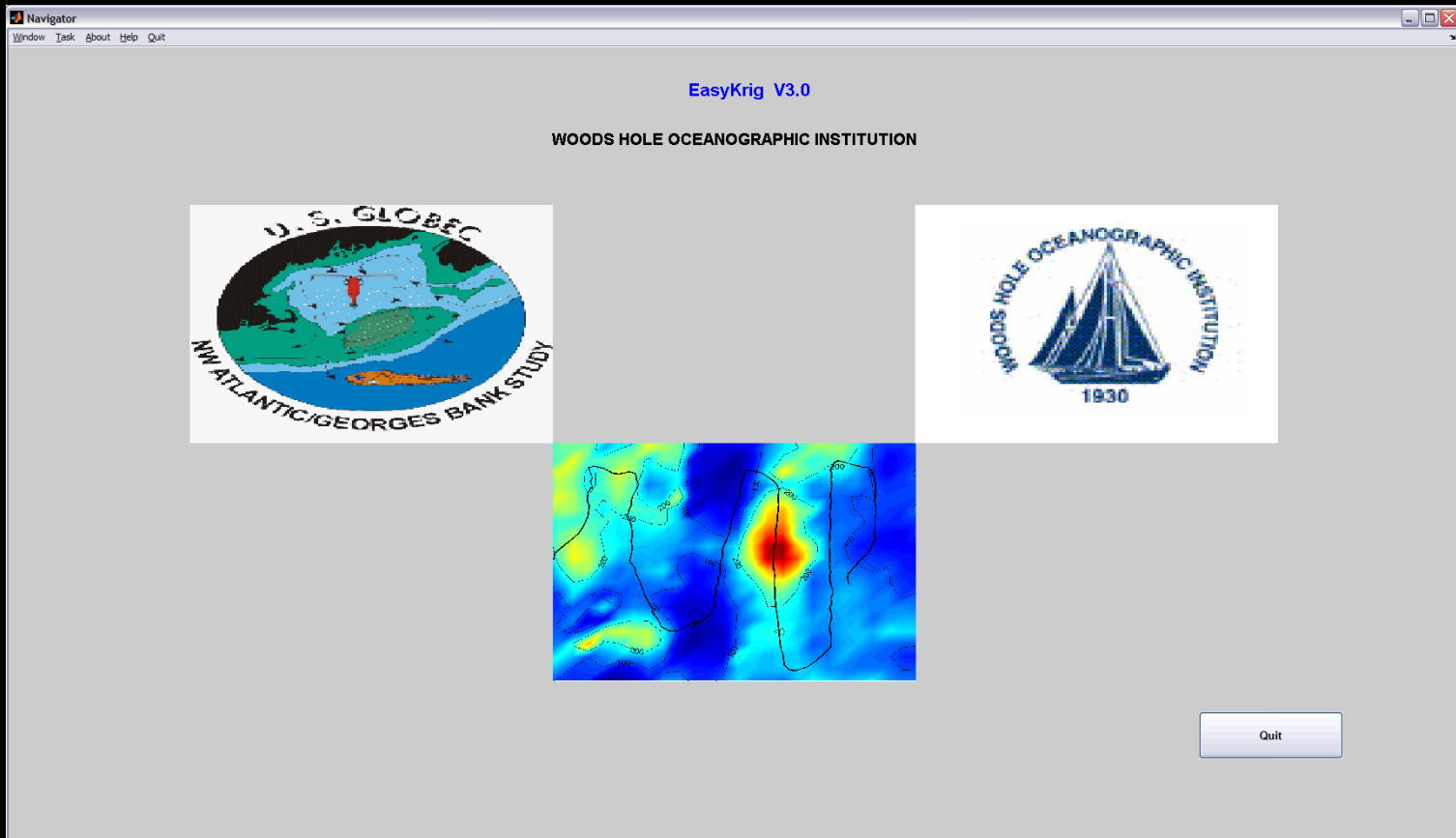
Files

Date	File	Tags	Downloads (last 30 days)	Comments	Ratings
19 Jan 2011	Number of packets arrived in one slot compute by arrive rate Author: Ice	simulation, communications, statistics		0	
18 Jan 2011	Generalized Hurst exponent Generalized Hurst exponent of a stochastic variable Author: Tommaso Aste	physics, statistics, finance, signal processing	27	0	
13 Jan 2011	MyRegressionIV Reaches a calibration problem that is to estimate mean value and confidence interval of x since y Author: Giuseppe Carillo	Inverse, statistics, probability, regression, probab, calibration	29	2	
13 Jan 2011	MyRegression A simple function on LS linear regression with many informative outputs Author: Giuseppe Carillo	statistics, probability, leastsquares linear r... least squares linear ...	67	6	3.7 / 7 ratings
13 Jan 2011	Kernel Density Estimator Reliable and extremely fast kernel density estimator for one-dimensional data Author: Zdravko Botev	automatic htech band... kernel smoothing, statistics, probability	287	15	4.6 / 16 ratings
12 Jan 2011	partial least squares-discriminant analysis and variable selection for high dimensional data chemometrics, metabolomics,	modeling, model population anal..., pl, statistics, variable selection, chemometrics	74	0	

Regression: 135

Time Series: 220

Anova: 42



Easy Krig 3.0

ftp://globec.whoi.edu/pub/software/kriging/easy_krig/V3.0.1/

Last updated in 2004! But it still works.

Interfacing with outside data

- Excel
 - Works on PCs with Matlab and Office installed
 - Functions like: `xlswrite`, `xlsread`
- Text Data
 - Can read delimited data easily
 - Can parse text strings with some effort
 - You can specify what to read and what to ignore
 - Some trial and error involved...