TECHNISCHE UNIVERSITÄT DRESDEN

# Introduction to Matlab

## Intro

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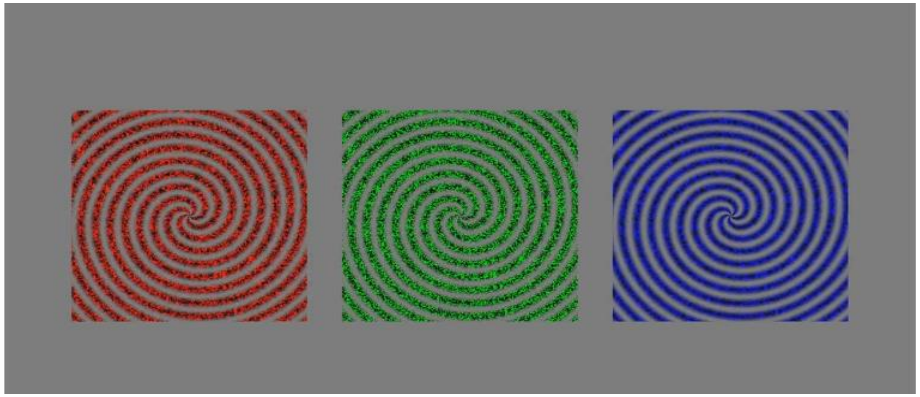
Dresden, 17.04.2015

DRESDEN concept
Exzellenz aus Wissenschaft und Kultur

# MATLAB in Psychology



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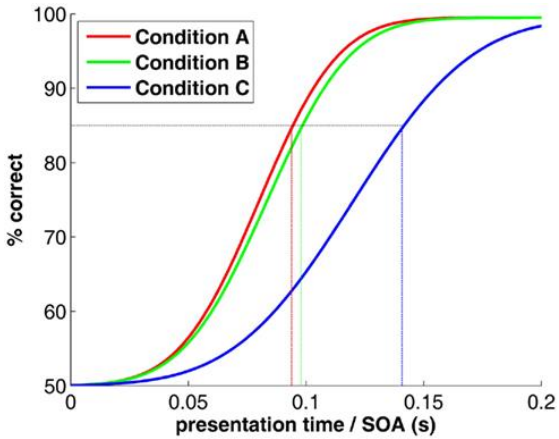
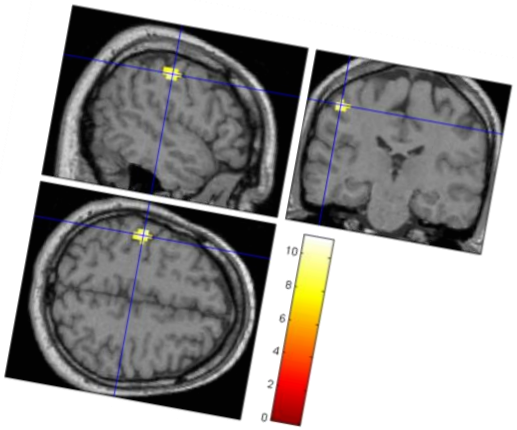
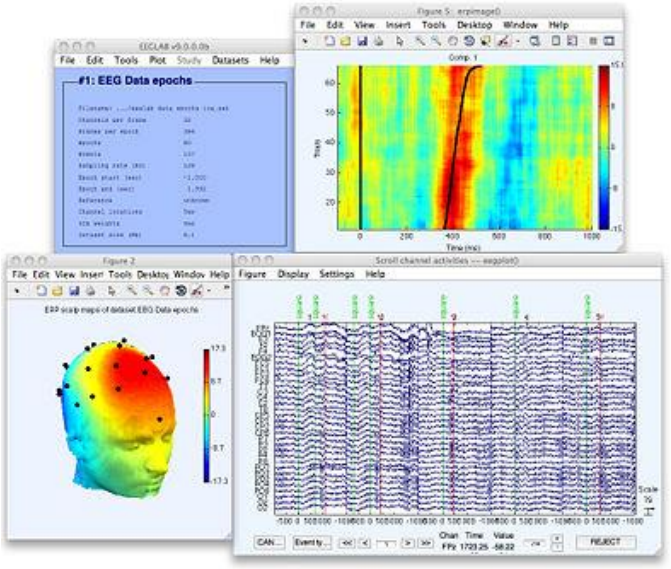



VanRullen (2011)



© SPM 12 Manual

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# MATLAB in Psychology

**Pros:**

- High-performance numerical computation, data analysis, visualization capabilities.
- Advanced editor and command-line features: You can write statements in MATLAB and have them calculate immediately so they are tested as you go.
- A very large and fast growing database of built-in programs and toolboxes for almost every scientific application:
  - Statistics and Machine Learning Toolboxes
  - Specialized Neuroscience Applications: SPM, EEGLAB, Psychtoolbox, …
  - Image Processing
- Thousands of fundamental and specialty function written by experts are available.
- **Cons:**
  - It’s rather expensive
  - (for the expert) Many built-in programs and toolboxes are not open-source.

# Seminar overview

| Date | Topics | Projects |
|---|---|---|
| 17.04. | Intro, basic operations, matrices | |
| 24.04. | Data handling, random numbers, basic plotting | 1st Project Assignment |
| 01.05. | Holiday (Labour day) | |
| 08.05 | Advanced plotting, scripts, control flow<br>1st Project Presentation | 1st Project Deadline<br>2nd Project Assignment |
| 15.05. | Control flow statements, signal processing, | |
| 22.05. | Functions, integration, image, and sound | |
| 29.05. | Holiday (Pfingstferien) | |
| 05.06. | Data Analysis, statistics,<br>2nd Project Presentation | 2nd Project Deadline |

# Textbook and Additional Resources

- **MATLAB for Psychologists (2012),** Borgo, M., Soranzo, A., Grassi, M., Springer-Verlag, 2012, ISBN. 978-1-4614-2196-2.
  - Available in SLUB as hard copy but not as electronic version

- **MATLAB for Neuroscientists, 2nd Ed: An Introduction to Scientific Computing (2014),** *Wallisch, P., Lusignan, M.E., Benayoun, M.D., Baker, T.I., Dickey, A.S. and Hatsopoulos, N.G.,* Academic Press, ISBN. 978-0123838360.

- **Matlab, 3rd ed: A Practical Introduction to Programming and Problem Solving (2013),** Attaway, S., Butterworth-Heinemann, ISBN. 978-0124058767.

  - Available in SLUB as hard copy and online (on Sciencedirect website) as an e-book.

- Additional Resources (Tutorial, codes, videos, etc.) can be shared on the course website.

# Grading Policy

- **Final Grade:**
  - Project 1: 40%
  - Project 2: 60%
- **Late submissions:**
  - **Extensions are generally not possible for the projects**
- **Project presentations:**
  - **Three randomly selected teams will present their project work**

# Team-work

- **Team-work is highly recommended**

- During seminar: One or two participants per computer
- Projects: Two participants each.

- Plagiarism policy:
  - Discussing solutions is **OK**
  - Getting ideas by going through codes shared by others or from other resources is **OK**
  - It is **not recommended** to post your solutions by email
  - **Copying-and-pasting** any part of written code from anywhere is **NOT OK**!

# Course Website and email contact

- **Course Website:**
  - goo.gl/pfcPrA (Shortened hyperlink)

- **Contact:**
  - **Pouyan Fard** pouyan.rafieifard@tu-dresden.de