

Statistical Neuroimage Modeling, Processing and Synthesis based on Texture and Component Analysis

Tackling the Small Sample Size Problem

Francisco Jesús Martínez Murcia

April 29, 2017

Center for modern beamer themes



Table of contents

1. Introducción
2. Reducing the Feature Space
3. Reducing the Feature Space
4. Conclusion

Introducción

Motivación

Motivación

El *Small Sample Size Problem*, o problema del pequeño tamaño muestral.

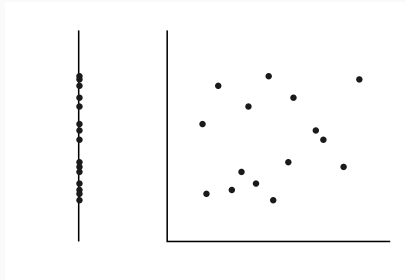
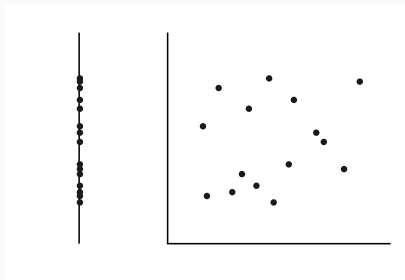


Figure 1: Separación de puntos en una y dos dimensiones.



En neuroimágen,

Introducción

Objetivos

Sections group slides of the same topic

```
\section{Elements}
```

for which **METROPOLIS** provides a nice progress indicator ...

METROPOLIS supports 4 different titleformats:

- Regular
- SMALLCAPS
- ALLSMALLCAPS
- ALLCAPS

They can either be set at once for every title type or individually.

Introducción

Estado del Arte

This frame uses the `smallcaps` titleformat.

Potential Problems

Be aware, that not every font supports small caps. If for example you typeset your presentation with pdfTeX and the Computer Modern Sans Serif font, every text in smallcaps will be typeset with the Computer Modern Serif font instead.

This frame uses the `allsmallcaps` titleformat.

Potential problems

As this titleformat also uses smallcaps you face the same problems as with the `smallcaps` titleformat. Additionally this format can cause some other problems. Please refer to the documentation if you consider using it.

As a rule of thumb: Just use it for plaintext-only titles.

Introducción

General Methodology

This frame uses the `allcaps` titleformat.

Potential Problems

This titleformat is not as problematic as the `allsmallcaps` format, but basically suffers from the same deficiencies. So please have a look at the documentation if you want to use it.

Reducing the Feature Space

Image Decomposition

The theme provides sensible defaults to
`\emph{emphasize}` text, `\alert{accent}` parts
or show `\textbf{bold}` results.

becomes

The theme provides sensible defaults to *emphasize* text, **accent** parts
or show **bold** results.

Font feature test

- Regular
- *Italic*
- SMALLCAPS
- **Bold**
- ***Bold Italic***
- **BOLD SMALLCAPS**
- Monospace
- Monospace *Italic*
- **Monospace Bold**
- **Monospace Bold *Italic***

Items

- Milk
- Eggs
- Potatos

Enumerations

1. First,
2. Second and
3. Last.

Descriptions

PowerPoint Meeh.
Beamer Yeeeha.

- This is important

- This is important
- Now this

- This is important
- Now this
- And now this

- This is really important
- Now this
- And now this

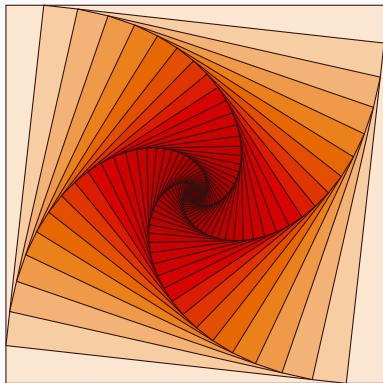


Figure 2: Rotated square from texample.net.

Reducing the Feature Space

Texture Analysis

Table 1: Largest cities in the world (source: Wikipedia)

City	Population
Mexico City	20,116,842
Shanghai	19,210,000
Peking	15,796,450
Istanbul	14,160,467

Three different block environments are pre-defined and may be styled with an optional background color.

Default

Block content.

Default

Block content.

Alert

Block content.

Alert

Block content.

Example

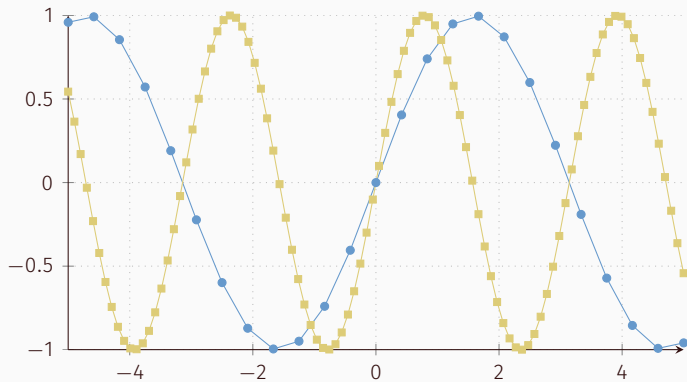
Block content.

Example

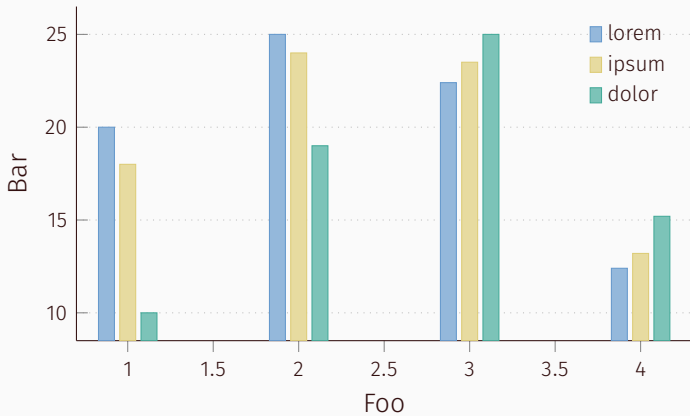
Block content.

$$e = \lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n$$

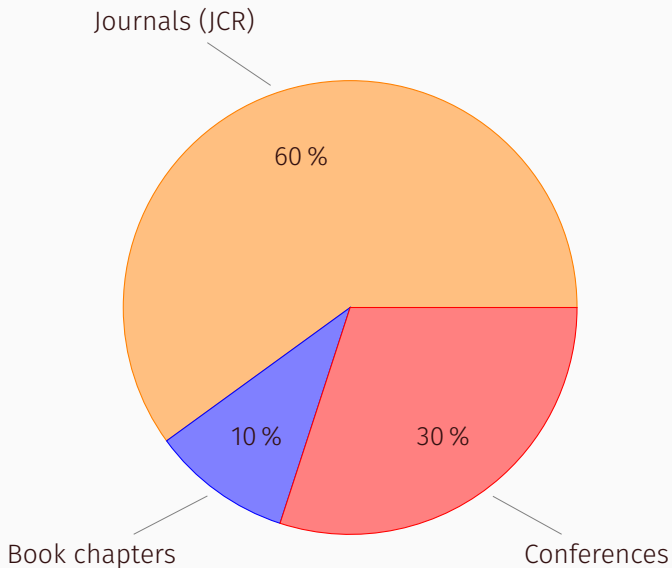
Line plots



Bar charts



Pie charts



Veni, Vidi, Vici

METROPOLIS defines a custom beamer template to add a text to the footer. It can be set via

```
\setbeamertemplate{frame footer}{My custom footer}
```

Some references to showcase [allowframebreaks] [1, 2, 3]

Get the source of this theme and the demo presentation from

`github.com/matze/mtheme`

The theme *itself* is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.



Questions?



Backup slides

Sometimes, it is useful to add slides at the end of your presentation to refer to during audience questions.

The best way to do this is to include the `appendixnumberbeamer` package in your preamble and call `\appendix` before your backup slides.

METROPOLIS will automatically turn off slide numbering and progress bars for slides in the appendix.

References I



K. Friston, J. Ashburner, S. Kiebel, T. Nichols, and W. Penny.
Statistical Parametric Mapping: The Analysis of Functional Brain Images.
Academic Press, 2007.



M. Jenkinson and S. Smith.
A global optimisation method for robust affine registration of brain images.
Medical image analysis, 5:143–156, June 2001.



M. Reuter, N. J. Schmansky, H. D. Rosas, and B. Fischl.
Within-subject template estimation for unbiased longitudinal image analysis.
NeuroImage, 61:1402–1418, July 2012.