

First Meeting Presentation

Project A2

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Bayesian Statistics course

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Presentation Flow

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Goal and Definition

Goal: Clustering weekly data of one year of PM10 (plus covariates)

Dataset: AGRIMONIA project, at

<https://zenodo.org/records/7563265>

Data Exploration

Model 1



Mozdzen A., Cremaschi A., Cadonna A., Guglielmi A., Kastner G. (2022)

Bayesian modeling and clustering for spatio-temporal areal data: An application to Italian unemployment

$$Y_{it} | \mathbf{x}_{it}, \beta_{s_i}^*, w_{it}, \sigma^2, s_i \stackrel{\text{ind}}{\sim} \mathcal{N}(\mathbf{x}_{it}^T \beta_{s_i}^* + w_{it}, \sigma^2)$$

$$\mathbf{w}_t | \mathbf{w}_{t-1}, \xi_s^*, \mathbf{s}, \tau^2, \rho, W \sim \mathcal{N}_I(\text{diag}(\xi_s^*) \mathbf{w}_{t-1}, \tau^2 Q(\rho, W)^{-1})$$

Model 2



Leonardo V. Teixeira, Renato M. Assunção, Rosangela H. Loschi (2019)
Bayesian Space-Time Partitioning by Sampling and Pruning Spanning Trees

The model is ecc

Paragraphs of Text

Sed iaculis **dapibus gravis**. Morbi sed tortor erat, nec interdum arcu. Sed id lorem lectus. Quisque viverra augue id sem ornare non aliquam nibh tristique. Aenean in ligula nisl. Nulla sed tellus ipsum. Donec vestibulum ligula non lorem vulputate fermentum accumsan neque mollis.

Sed diam enim, sagittis nec condimentum sit amet, ullamcorper sit amet libero. Aliquam vel dui orci, a porta odio.
— *Someone, somewhere. . .*

Nullam id suscipit ipsum. Aenean lobortis commodo sem, ut commodo leo gravis vitae. Pellentesque vehicula ante iaculis arcu pretium rutrum eget sit amet purus. Integer ornare nulla quis neque ultrices lobortis.

Lists

Bullet Points and Numbered Lists

- Lorem ipsum dolor sit amet, consectetur adipiscing elit
 - Aliquam blandit faucibus nisi, sit amet dapibus enim tempus
 - Lorem ipsum dolor sit amet, consectetur adipiscing elit
 - Nam cursus est eget velit posuere pellentesque
 - Nulla commodo, erat quis gravida posuere, elit lacus lobortis est, quis porttitor odio mauris at libero
-
- ① Nam cursus est eget velit posuere pellentesque
 - ② Vestibulum faucibus velit a augue condimentum quis convallis nulla gravida

Blocks of Highlighted Text

Block Title

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Integer lectus nisl, ultricies in feugiat rutrum, porttitor sit amet augue.

Example Block Title

Aliquam ut tortor mauris. Sed volutpat ante purus, quis accumsan.

Alert Block Title

Pellentesque sed tellus purus. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos himenaeos.

Suspendisse tincidunt sagittis gravida. Curabitur condimentum, enim sed venenatis rutrum, ipsum neque consectetur orci.

Multiple Columns

Subtitle

Heading

- ① Statement
- ② Explanation
- ③ Example

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Integer lectus nisl, ultricies in feugiat rutrum, porttitor sit amet augue. Aliquam ut tortor mauris. Sed volutpat ante purus, quis accumsan dolor.

Table

Subtitle

Treatments	Response 1	Response 2
Treatment 1	0.0003262	0.562
Treatment 2	0.0015681	0.910
Treatment 3	0.0009271	0.296

Table: Table caption

Figure

Figure: Space for a possible image.

Definitions & Examples

Definition

A **prime number** is a number that has exactly two divisors.

Example

- 2 is prime (two divisors: 1 and 2).
- 3 is prime (two divisors: 1 and 3).
- 4 is not prime (**three** divisors: 1, 2, and 4).

You can also use the theorem, lemma, proof and corollary environments.

Theorem, Corollary & Proof

Theorem (Mass–energy equivalence)

$$E = mc^2$$

Corollary

$$x + y = y + x$$

Proof.

$$\omega + \phi = \epsilon$$



Equation

$$\cos^3 \theta = \frac{1}{4} \cos \theta + \frac{3}{4} \cos 3\theta \quad (1)$$

Verbatim

Example (Theorem Slide Code)

```
\begin{frame}  
\frametitle{Theorem}  
\begin{theorem}[Mass--energy equivalence]  
$E = mc^2$  
\end{theorem}  
\end{frame}
```


Slide without title.

Citing References

An example of the `\cite` command to cite within the presentation:

This statement requires citation [Smith, 2022, Kennedy, 2023].

References



John Smith (2022)

Publication title

Journal Name 12(3), 45 – 678.



Annabelle Kennedy (2023)

Publication title

Journal Name 12(3), 45 – 678.

Acknowledgements

Smith Lab

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The End

Questions? Comments?