Advances in Approximate Bayesian Inference LaTeX Style Guide

First Author[1,*,†] **Second Author**[1,2,*] **Third Author**[2]

[1]Affiliation 1
[2]Affiliation 2
[*]Equal contribution
[†]Correspondence to email@example.com

Abstract

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1 Introduction

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$$\bar{x} = \frac{1}{n}\sum_{i=1}^{i=n} x_i = \frac{x_1 + x_2 + \ldots + x_n}{n}$$

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$$\int_0^\infty e^{-\alpha x^2} \mathrm{d}x = \frac{1}{2}\sqrt{\int_{-\infty}^\infty e^{-\alpha x^2} \mathrm{d}x \int_{-\infty}^\infty e^{-\alpha y^2} \mathrm{d}y} = \frac{1}{2}\sqrt{\frac{\pi}{\alpha}}$$

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$$\sum_{k=0}^\infty a_0 q^k = \lim_{n\to\infty} \sum_{k=0}^n a_0 q^k = \lim_{n\to\infty} a_0 \frac{1-q^{n+1}}{1-q} = \frac{a_0}{1-q}$$

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$$x_{1,2} = \frac{-b \pm \sqrt{b^2-4ac}}{2a} = \frac{-p \pm \sqrt{p^2-4q}}{2}$$

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$$\frac{\partial^2\Phi}{\partial x^2} + \frac{\partial^2\Phi}{\partial y^2} + \frac{\partial^2\Phi}{\partial z^2} = \frac{1}{c^2}\frac{\partial^2\Phi}{\partial t^2}$$

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1.1 Sub-sections

Sub-sections are produced using `\subsection`. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

1.1.1 Sub-sub-sections

Sub-sub-sections are produced using `\subsubsection`. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

Figure 1. Wrapped Figure Example

Sub-sub-sub-sections Sub-sub-sub-sections are produced using `\paragraph`. These are unnumbered with a running head.

Sub-sub-sub-sub-sections Sub-sub-sub-sub-sections are produced using `\subparagraph`. These are unnumbered with a running head.

1.2 Figures

Figures should go in the `figure` environment. If you want to scale the image, it's better to use a fraction of the line width rather than an explicit length. For example, see Fig. 2.

2 Cross-Referencing

Always use `\label` and `\cref` (or `\Cref` if at the beginning of a sentence) when cross-referencing. For example, the next section is Section 3.

Figure 2. Example Image

3 Equations

The jmlr class loads the amsmath package, so you can use any of the commands and environments defined there. (See the amsmath documentation for further details.[1])

Unnumbered single-lined equations should be displayed using \[and \]. For example:

$$E = mc^2$$

or you can use the displaymath environment:

$$E = mc^2$$

Numbered single-line equations should be displayed using the equation environment. For example:

$$\cos^2\theta + \sin^2\theta \equiv 1 \tag{1}$$

This can be referenced using \label and \eqref. For example, (1).

Multi-lined numbered equations should be displayed using the align environment.[2] For example:

$$\begin{align} f(x) &= x^2 + x \tag{2} \\ f'(x) &= 2x + 1 \tag{3} \end{align}$$

Unnumbered multi-lined equations can be displayed using the align* environment. For example:

$$\begin{align*} f(x) &= (x+1)(x-1) \\ &= x^2 - 1 \end{align*}$$

If you want to mix numbered with unnumbered lines use the align environment and suppress unwanted line numbers with \nonumber. For example:

$$\begin{align} y &= x^2 + 3x - 2x + 1 \nonumber \\ &= x^2 + x + 1 \tag{4} \end{align}$$

An equation that is too long to fit on a single line can be displayed using the split environment. Text can be embedded in an equation using \text or \intertext (as used in Theorem 1). See the amsmath documentation for further details.

4 Theorems, Lemmas etc

The following theorem-like environments are predefined by the jmlr class: theorem, example, lemma, proposition, remark, corollary, definition, conjecture and axiom. You can use the proof environment to display the proof if need be, as in Theorem 1.

1. Either texdoc amsmath or http://www.ctan.org/pkg/amsmath
2. For reasons why you shouldn't use the obsolete eqnarray environment, see Lars Madsen, *Avoid eqnarray!* TUGboat 33(1):21–25, 2012.

Table 1. Full-Width Table Example: Performance Comparison Across Different Methods

Method	Dataset 1	Dataset 2	Dataset 3	Dataset 4	Runtime (s)
Baseline Method	0.823	0.756	0.734	0.812	125.4
Improved Method A	0.847	0.789	0.768	0.834	98.7
Improved Method B	0.856	0.801	0.782	0.845	87.3
Our Method	**0.871**	**0.823**	**0.796**	**0.862**	**73.2**

Theorem 1 (Eigenvalue Powers). *If λ is an eigenvalue of $\vec{B}$ with eigenvector $\vec{\xi}$, then λ^n is an eigenvalue of $\vec{B}^n$ with eigenvector $\vec{\xi}$.*

Proof. Let λ be an eigenvalue of $\vec{B}$ with eigenvector ξ, then

$$\vec{B}\vec{\xi} = \lambda\vec{\xi}$$

premultiply by $\vec{B}$:

$$\begin{aligned}\vec{B}\vec{B}\vec{\xi} &= \vec{B}\lambda\vec{\xi}\\ \Rightarrow \vec{B}^2\vec{\xi} &= \lambda\vec{B}\vec{\xi}\\ &= \lambda\lambda\vec{\xi} \qquad \text{since } \vec{B}\vec{\xi} = \lambda\vec{\xi}\\ &= \lambda^2\vec{\xi}\end{aligned}$$

Therefore true for $n = 2$. Now assume true for $n = k$:

$$\vec{B}^k\vec{\xi} = \lambda^k\vec{\xi}$$

premultiply by $\vec{B}$:

$$\begin{aligned}\vec{B}\vec{B}^k\vec{\xi} &= \vec{B}\lambda^k\vec{\xi}\\ \Rightarrow \vec{B}^{k+1}\vec{\xi} &= \lambda^k\vec{B}\vec{\xi}\\ &= \lambda^k\lambda\vec{\xi} \qquad \text{since } \vec{B}\vec{\xi} = \lambda\vec{\xi}\\ &= \lambda^{k+1}\vec{\xi}\end{aligned}$$

Therefore true for $n = k + 1$. Therefore, by induction, true for all n. □

4.1 Full-Width Tables

For tables that need to span the full width of the page or contain many columns, you can use the `table*` environment. Here's an example using booktabs for professional formatting:

4.2 Wrapped Tables

Sometimes you want a table to be embedded within the text flow. The `wraptable` environment allows text to wrap around the table.

This paragraph demonstrates how text flows around the wrapped table. The table appears on the right side of the text, and the content naturally wraps around it. This is particularly useful for smaller tables that contain summary information or key results

Table 2. Summary Results

Method	Accuracy	Time
Method A	85.3%	12.4s
Method B	87.1%	15.7s
Our Method	**89.6%**	**10.2s**

that you want to highlight without breaking the flow
of the main text.

You can position the table on the left using `{l}` or on
the right using `{r}` as the first parameter to `wraptable`. The second parameter controls the width allocated to the table.

The wrapped table maintains proper spacing and formatting while allowing the text to flow naturally. This technique is especially effective in documents where you want to present data without interrupting the narrative flow. Notice how this paragraph continues to wrap around the table, demonstrating the natural text flow that can be achieved with this approach.

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The `table*` environment is ideal for comprehensive comparison tables, while `wraptable` works well for smaller summary tables that complement the surrounding text. ‘

5 Citations and Bibliography

The `jmlr` class automatically loads `natbib` and automatically sets the bibliography style, so you don't need to use `\bibliographystyle`. This sample file has the citations defined in the accompanying BibTeX file `jmlr-sample.bib`. For a parenthetical citation use `\citep`. For example (Guyon and Elisseeff, 2003). For a textual citation use `\citet`. For example Guyon et al. (2007). Both commands may take a comma-separated list, for example Guyon and Elisseeff (2003); Guyon et al. (2007).

These commands have optional arguments and have a starred version. See the `natbib` documentation for further details.[3] The bibliography is displayed using `\bibliography`.

3. Either `texdoc natbib` or http://www.ctan.org/pkg/natbib

Acknowledgments and Disclosure of Funding

Acknowledgements go here.

References

I. Guyon and A. Elisseeff. An introduction to variable and feature selection. *JMLR*, 3:1157–1182, March 2003.

I. Guyon, C. Aliferis, and A. Elisseeff. Causal feature selection. Technical report, Clopinet, 2007.

Appendix A. First Appendix

This is the first appendix.

Appendix B. Second Appendix

This is the second appendix.