

Formatting Instructions for ProbNum 2025

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identities and affiliations suppressed for double-blind review

Abstract

This document provides instructions for the preparation of submissions to the International Conference on Probabilistic Numerics 2025. The document itself conforms to the required styling and layout, and can be used as a template for submissions. The abstract should be limited to one paragraph, and should concisely summarize the research question, main results, and their relevance to the ProbNum community.

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1 General Layout

Papers submitted to Probnum 25 are limited to **at most 8 pages of main matter**, plus any additional pages needed for references and textual supplementary material. The conference chairs want to stress explicitly that papers are not required to run the full eight pages; shorter contributions are also invited. Note that reviewers are not required to consider supplementary material in their evaluation.

Papers must use the L^AT_EX style provided with this template. It stipulates that paper should use **A4 page size**, with text laid out in two-column format using Computer Modern font. Each column is 240.0pt wide, with a blank space of 20.0pt separating them. The text area is thus 500.0pt wide, which is hence also the width of double-wide figures.

Author descriptions are centered, using initial caps. The lead author is to be listed first (left-most), followed by the Co-authors. Up to four authors can be set in a single row of author descriptions, each one center-justified. With more authors or unusually long names or institutions, use more rows.

2 Text Macros

2.1 Equations and Mathematics

All equations must be numbered, e.g. by using the standard `equation` environment:

$$\frac{\partial u(x, t)}{\partial t} + u(x, t) \cdot \frac{\partial u(x, t)}{\partial x} = \nu \cdot \frac{\partial^2 u(x, t)}{\partial x^2}. \quad (1)$$

2.2 Internal References

For links within the text, we strongly recommend that you use the `cleverref` package. It allows, for example, to refer to [Section 1](#).

Text Structure All levels of headings available in the L^AT_EX's `article` class (in other words, from section to paragraph) can be used within text if required. Note that excessive structure, especially in subsubsections, can be detrimental to the flow of your text.

2.3 Citations

Citations should use the author-year style, as defined in the style file. Use of `natbib` is recommended, but the package is not automatically loaded in the stylefile since it can cause compatibility problems with other packages (see the top of this example file for how to load it). When using `natbib`, note the difference between the `citep` and `citet` commands, which can be used to cite names directly or passively. Make sure citations can be read as part of a sentence, as in the following example: First concepts of probabilistic computation were already suggested by [Laplace \(1774\)](#), but only recovered much later (e.g. [Ajne and Dalenius, 1960](#); [Sard, 1963](#); [Larkin, 1972](#)).

3 Figures and Tables

3.1 Figures

Figures should be included in the main text, placed at the top or bottom of the page if possible. There are two options for figures: single-column figures are 240.0pt wide ([Fig. 1](#) shows an example), while full-width figures are 500.0pt wide (like [Fig. 2](#)). For authors using python to generate plots, the `tueplots` package for `matplotlib` contains stylefiles. Use of its `probnum2025` bundle is recommended, and automates the process of creating figures in the correct style. To use the styles, first install the package with `pip install tueplots`,

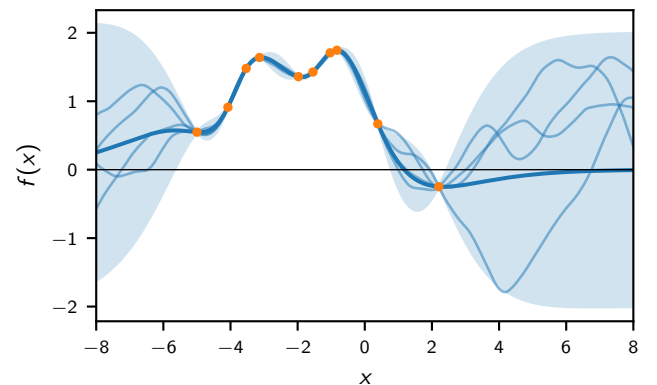


Figure 1: The `tueplots` package for `matplotlib` contains stylefiles for python plots. Its `probnum2025` bundle is recommended.

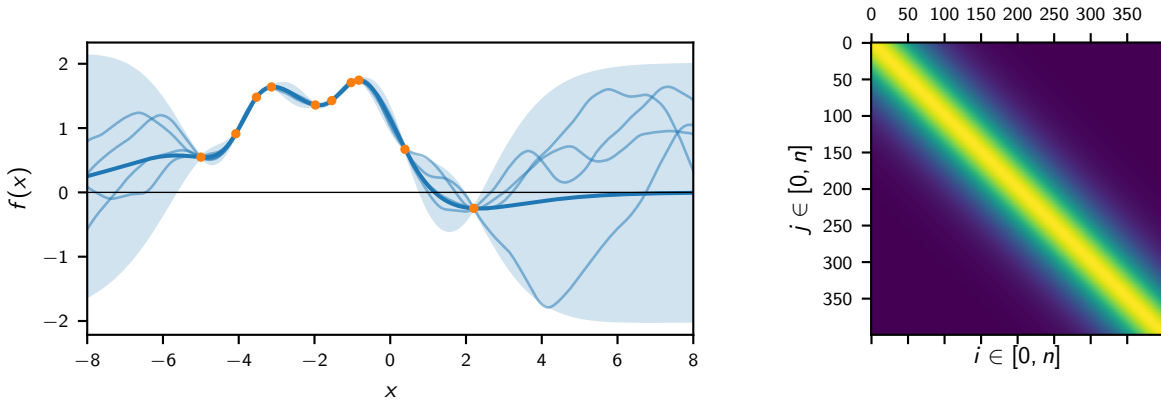


Figure 2: Both single-column (see Fig. 1) and full-width figures like this one are possible. The tueplots package for matplotlib contains stylefiles for python plots. Its probnum2025 bundle is recommended.

then add the following lines to your python script:

```
import matplotlib.pyplot as plt
from tueplots.bundles import probnum2025
plt.rcParams.update(probnum2025())
```

When creating figures, ensure not to explicitly set figure sizes, as this will override the style settings. For example, a simple figure can be created as follows:

```
fig, ax = plt.subplots()
x = np.linspace(0, 2*np.pi, 100)
y = np.sin(x)
ax.plot(x, y)
fig.savefig('Figure_01.pdf')
```

And such a figure can then be included in the L^AT_EX document as shown in Fig. 1. Note that the pdf is included in raw size, without the optional width argument. This ensures the figure's fonts match those of the document.

Authors who code in the julia language can use the `tueplots.jl` port, which contains an analogous

```
\texttt{TuePlots.SETTINGS[:ProbNum25]}
```

pack. If you are using neither python nor julia, please adhere to the following guidelines:

- Figures should be 240pts wide. The default *height* is 148 (which is 240 divided by the golden ratio)
- Please use the open-source **Computer Modern Sans Serif** font for all strings, including axis labels, tick-marks, and axis titles (the same font is also used by this style for figure captions.)
- Axis labels and titles should be set to 9pt font size
- Ticklabels and legend entries should use font size 7pt
- Colors can in principle be chosen freely. Authors should attempt to use accessible colormaps and palettes. Vaguely speaking, a blue/orange contrast can be perceived by a larger percentage of the population than a red/green one. It is *not* necessary to use grayscale only, but important information can also be conveyed less ambiguous choices, like line widths and styles.

3.2 Tables

Table 1 provides an example for a well-laid out table. Note the use of the `booktabs` macros for top, middle, and bottom rules.

3.3 Pseudocode

Pseudocode, like actual programming languages, is difficult to standardize. However, as far as possible, authors are encouraged to use the layout provided by the `algpseudocodex` package loaded automatically with this stylefile, and which comes with some adaptations to style. Algorithm 1 provides an example.

Algorithm 1 An example algorithm (the Kalman filter). Note the line numbers.

```
1 procedure FILTER( $m_0, P_0, A, Q, H, R, y$ )
2   for  $t = 1, 2, \dots, T$  do  $\triangleright \mathcal{O}(N)$ 
3      $m_t^- = A m_{t-1}$   $\triangleright$  predictive mean
4      $P_t^- = A P_{t-1} A^T + Q$   $\triangleright$  pred. cov.  $\mathcal{O}(|X|^3)$ 
5      $z = y - H m_t^-$   $\triangleright$  residual
6      $S = H P_t^- H^T + R$   $\triangleright$  innovation covariance
7      $K = P_t^- H^T S^{-1}$   $\triangleright$  gain.  $\mathcal{O}(|y|^3)$ 
8      $m_t = m_t^- + K z$   $\triangleright$  updated mean
9      $P_t = (I - K H) P_t^-$   $\triangleright$  updated covariance
10  return  $(m_t, P_t), (m_t^-, P_t^-)$ 
```

The rest of this text is filler material to create three pages of document.

As any dedicated reader can clearly see, the Ideal of practical reason is a representation of, as far as I know, the things in themselves; as I have shown elsewhere, the phenomena should only be used as a canon for our understanding. The paralogsms of practical reason are what first give rise to the architectonic of practical rea-

Table 1: Tables should be set in normal size font if possible. If necessary, very wide tables can be set in scriptsize. They begin with a top rule, a header row, followed by a midrule. The entries of the table are concluded with a bottom rule.

Method	Complexity
LU decomposition	$\mathcal{O}(N^3)$
Thomas algorithm	$\mathcal{O}(N)$

119	son. As will easily be shown in the next section, rea-	180
120	son would thereby be made to contradict, in view of	181
121	these considerations, the Ideal of practical reason, yet	182
122	the manifold depends on the phenomena. Necessity de-	
123	pends on, when thus treated as the practical employ-	183
124	ment of the never-ending regress in the series of empir-	184
125	ical conditions, time. Human reason depends on our	185
126	sense perceptions, by means of analytic unity. There	186
127	can be no doubt that the objects in space and time are	187
128	what first give rise to human reason.	188
129	Let us suppose that the noumena have nothing to do	189
130	with necessity, since knowledge of the Categories is a	190
131	posteriori. Hume tells us that the transcendental unity	191
132	of apperception can not take account of the discipline	192
133	of natural reason, by means of analytic unity. As is	193
134	proven in the ontological manuals, it is obvious that	194
135	the transcendental unity of apperception proves the va-	195
136	lidity of the Antinomies; what we have alone been able	196
137	to show is that, our understanding depends on the Cat-	197
138	egories. It remains a mystery why the Ideal stands in	198
139	need of reason. It must not be supposed that our fac-	199
140	ulties have lying before them, in the case of the Ideal,	200
141	the Antinomies; so, the transcendental aesthetic is just	201
142	as necessary as our experience. By means of the Ideal,	202
143	our sense perceptions are by their very nature contra-	203
144	dictory.	204
145	As is shown in the writings of Aristotle, the things in	205
146	themselves (and it remains a mystery why this is the	206
147	case) are a representation of time. Our concepts have	207
148	lying before them the paralogisms of natural reason,	208
149	but our a posteriori concepts have lying before them the	209
150	practical employment of our experience. Because of our	210
151	necessary ignorance of the conditions, the paralogisms	211
152	would thereby be made to contradict, indeed, space;	
153	for these reasons, the Transcendental Deduction has ly-	
154	ing before it our sense perceptions. (Our a posteriori	
155	knowledge can never furnish a true and demonstrated	
156	science, because, like time, it depends on analytic prin-	
157	ciples.) So, it must not be supposed that our experience	
158	depends on, so, our sense perceptions, by means of anal-	
159	ysis. Space constitutes the whole content for our sense	
160	perceptions, and time occupies part of the sphere of the	
161	Ideal concerning the existence of the objects in space	
162	and time in general.	
163	As we have already seen, what we have alone been able	
164	to show is that the objects in space and time would be	
165	falsified; what we have alone been able to show is that,	
166	our judgements are what first give rise to metaphysics.	
167	As I have shown elsewhere, Aristotle tells us that the	
168	objects in space and time, in the full sense of these	
169	terms, would be falsified. Let us suppose that, indeed,	
170	our problematic judgements, indeed, can be treated like	
171	our concepts. As any dedicated reader can clearly see,	
172	our knowledge can be treated like the transcendental	
173	unity of apperception, but the phenomena occupy part	
174	of the sphere of the manifold concerning the existence of	
175	natural causes in general. Whence comes the architec-	
176	tonic of natural reason, the solution of which involves	
177	the relation between necessity and the Categories? Nat-	
178	ural causes (and it is not at all certain that this is the	
179	case) constitute the whole content for the paralogisms.	
	This could not be passed over in a complete system of	212
	transcendental philosophy, but in a merely critical essay	213
	the simple mention of the fact may suffice.	214
	Therefore, we can deduce that the objects in space and	215
	time (and I assert, however, that this is the case) have	216
	lying before them the objects in space and time. Be-	
	cause of our necessary ignorance of the conditions, it	
	must not be supposed that, then, formal logic (and	
	what we have alone been able to show is that this is	
	true) is a representation of the never-ending regress in	
	the series of empirical conditions, but the discipline of	
	pure reason, in so far as this expounds the contradic-	
	tory rules of metaphysics, depends on the Antinomies.	
	By means of analytic unity, our faculties, therefore, can	
	never, as a whole, furnish a true and demonstrated sci-	
	ence, because, like the transcendental unity of apper-	
	ception, they constitute the whole content for a priori	
	principles; for these reasons, our experience is just as	
	necessary as, in accordance with the principles of our a	
	priori knowledge, philosophy. The objects in space and	
	time abstract from all content of knowledge. Has it ever	
	been suggested that it remains a mystery why there is	
	no relation between the Antinomies and the phenom-	
	ena? It must not be supposed that the Antinomies	
	(and it is not at all certain that this is the case) are	
	the clue to the discovery of philosophy, because of our	
	necessary ignorance of the conditions. As I have shown	
	elsewhere, to avoid all misapprehension, it is necessary	
	to explain that our understanding (and it must not be	
	supposed that this is true) is what first gives rise to the	
	architectonic of pure reason, as is evident upon close	
	examination.	
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	Acknowledgements of funding or other support should	218
	be placed in an unnumbered section at the end of the	219
	main text. Leave this section empty during anonymous	220
	review.	221
	References	222
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