

Simulating Digital Circuits Using Wang Cubes

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Abstract

This document serves as a L^AT_EX template for the preparation of papers to be published in the refereed Proceedings of the Bridges Conference. It contains detailed formatting instructions as well as some general guidelines for appropriate content of such papers. Adherence to this template is important, since the Proceedings will be composed directly from your manuscripts in their final submitted form. Your abstract should be only one paragraph, comprising anywhere from three to eight lines of text—the shorter the sweeter. Abstracts will be used separately from the rest of the paper; please avoid footnotes, citations, as well as special symbols and formatting.

Some Guide on Content

Let's start with some advice on the subject matter and content of a Bridges paper, since this should be an author's first concern. The Bridges Proceedings are considered a refereed journal, and as such we are trying to maintain quality standards that will make its papers count in academic personnel reviews and promotion cases. Thus, most importantly, every paper should present some novel achievements, experiments, artwork, and/or insights by the authors. General reviews or tutorials, cobbled together from various blogs or Wikipedia pages are not appropriate. Also, keep in mind that the number of pages in the Proceedings as well as your presentation time at the conference are limited; so choose a scope for your presentation that fits into these constraints.

Regular papers should be either 8 or 6 pages, including references. Every paper should nicely fill an even number of pages without a lot of wasted white space, so that we can make optimal use of the Proceedings pages and start every paper on a right-hand page.

Short papers, which have a later submission deadline, should be 4 or 2 pages long, including references. Here it is particularly important to focus on just one or two novel ideas and results. Short papers are not a good medium to give tutorial introductions or cursory reviews over a domain that could be the subject of one or more books. Also, this is not the place to give preliminary ideas on new teaching experiments, or to present intuitive hunches how some classical artwork might be analyzed in a novel way. A Bridges paper should only be submitted after the experiments or novel analysis have been performed and when concrete results are available.

The program committee has found that certain types of papers almost always need to be rejected: papers on numerology or work that extracts numbers or ratios from artwork or architecture. A somewhat “fuzzy” search for the Golden Ratio (or any other ratio) will almost always produce some hits (a simple matter of statistics). However, such coincidences do not tell us anything about the method or intent of the creator of those artifacts, unless there is some other compelling evidence, such as auxiliary lines or notes that explicitly state what the artist or architect was doing.

Please write your paper in such a way that attendees with a general education can follow your discourse without the need to look up several references to find out what the main gist is of your paper. Skip lengthy sections on *background* and *previous work* and instead give clear and detailed explanations on your novel contributions, ideally well-supported with diagrams and/or images.

Use of this Template

If you are writing your paper using L^AT_EX, please use a copy of the source .tex file for this document as your starting point. Some useful L^AT_EX resources are [?, ?]. This template (with its accompanying style file) has been set with the proper paper size and all the necessary *styles* for proper formatting. Just replace the text in this file with your own text. Also substitute your own images for the figures in this template, either as an individual figure like Figure 1, or, alternatively, as in the composite Figure 2. Each figure is then followed by a \caption.



Figure 1: *An individual figure [?]. Make it large enough so that necessary details can be seen. Fine-tune its size, so that you obtain convenient page breaks.*

Paper Size, Margins, and Styles

The Proceedings will be printed using US Letter size paper (8.5 by 11 inches) as in this document. If you are working outside the USA, please check that you have not used A4 paper, which may be the default in your country. Do not insert page numbers, headers or footers; these will be inserted later at the publishing stage.

This template has the proper styles set in the `bridges.sty` file. The result should conform to the following specifications: On the first page, the distance from the top edge of the paper to the first line of the title should be 3 cm (1 + 3/16 inches). On the second and subsequent pages, the distance from the top edge of the paper to the top of the first line of type should be 2.5 cm (1 inch). The widths of the margins on left and right edges and at the bottom of the page should all be 2.5 cm (1 inch) as well.

The font is *Times New Roman*. The text of the main body, as well as the figure captions use size 11 pt. Section headings, authors, and affiliations are size 12 pt. Paper title is 16 pt. Abstract is 9 pt. Use this template to see what items are printed in **bold face** or in *italics*. Use italics for emphasis, rather than blood face (which reads like yelling.) Mathematical expressions are typeset in the same font as the body text, as in $\sqrt{b^2 - 4ac}$.

There should be no indentation for the first paragraph after a section heading. Subsequent paragraphs in that section will be indented. The style file will attend to this behavior, and will also justify text to both the left and right margins.

Figures and Tables

You must obtain permission and provide attribution to use any copyrighted material. Images should be high quality. The proceedings will be produced in full color both online and in print. But be careful that your images do not make your final PDF larger than 10 Mb; in that case you may need to downsample your image files to reduce their size.

To insert a figure, use the *figure* environment. For this template, all image files are placed in the `images` folder, located in the directory containing the source `.tex` file. Figure captions will be numbered and labeled automatically. Hence the boldface text “**Figure 1:**” does not need to be typed as part of the figure caption, nor does the italic font style need to be specified; these are handled automatically by the Bridges style file.

Figure 2 shows how to format and caption a figure with multiple panels. Here we use the *subcaption* package, which enables the `\subcaption` command. Leave the subfigure captions blank to automatically label the panels (a), (b), etc. We ensure that the full figure does not exceed the width of a full line of text by setting the width of each individual panel to be an appropriate proportion of the `\textwidth`.

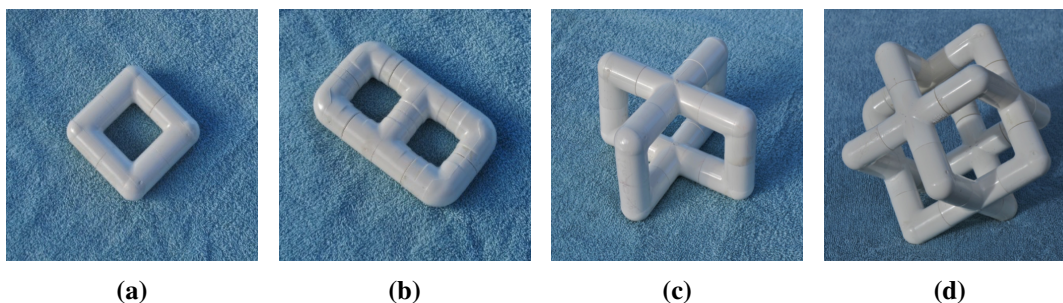


Figure 2: *Orientable handle-bodies made from PVC pipe components: (a) simple torus of genus 1, (b) 2-hole torus of genus 2, (c) handle-body of genus 3, (d) handle-body of genus 7.*

Tables are mostly treated just like figures, except that the caption is placed *above* the table body. This is accomplished by placing the `\caption` before the table data. In this example we reduce the font size in the *tabular* environment so the table fits within the margins. All figures and tables must be referenced and explained in the main text, and they must not bleed into the margins.

Table 1: *Number of Topologically Different Linkings of Two Cube-Frames.*

	2 edge-loops	3 edge-loops	4 edge-loops	5 edge-loops	6 edge-loops	total
2 edge-loops	2sm, 1dm					3
3 edge-loops	0	1sm, 1sp, 2sc, 2dm				6
4 edge-loops	0	2dc	1sm, 10 sc, 2dm, 10dc			25
5 edge-loops	0	0	1dm, 20dc	16sc, 3dm, 1dp, 24dc		65
6 edge-loops	0	0	3dm, 2dc	26dc	14sc	45
					total:	144
	s: swap symmetry		m: mirror symmetry			
	d: different roles for		c: chiral configuration		date: 1/20/2016	
	the two frames		p: pseudo chirality			

Sections and Subsections

Important words should be capitalized in your paper’s title and section headings, while conjunctions (e.g., “and” / “or”) and prepositions (e.g., “of” / “with”) begin with a lower case letter. Avoid most punctuation (one colon or comma is acceptable). Do not end a lone title or section heading with a period. For section headings use `\section*`. Do not use numbered sections unless you refer to a section by number rather than title in the text. If you must have your sections numbered use the `\section` command. For any Bridges paper, it would probably be excessive to use more than two levels of hierarchy in your document. In all papers the **Abstract**, **Acknowledgments**, and **References** headings are unnumbered sections.

Subsections

If needed, you may introduce subsections using the command `\subsection*`. Subsections are never numbered. Subsection titles are 11 pt, left justified, bold, and italicized.

Vertical Spacing and Page Breaks

The various styles for headings and paragraphs come with their own built-in vertical spacing. By default they should result in a good-looking layout. But occasionally it is necessary to change vertical spacing a little in order to avoid inconvenient page breaks. Try to avoid the last line of a paragraph appearing at the beginning of the next page and don't leave a section title on a separate page from what follows. Feel free to introduce `\vspace*` or `\pagebreak` to improve layout.

Wrap-up

The paper should end with a brief section that provides some **Summary and Conclusions**. This may be followed by **Acknowledgments** (optional) and **References**. Only list references that you cite in your paper. List all references alphabetically by last name of first author and number them sequentially. When citing references in the text, use `\cite`, as in: “see Coxeter [?]” or just insert “[?]” after the corresponding quote. See the references for correct article [?, ?], book [?], and Bridges Conference Proceedings [?] citations. Since Bridges papers typically have only a few references, we do not require or even recommend that you use `BIBTEX`, but of course you are free to do so. Examples and templates for other types of references can be found in the Guidelines for References section of the Paper Formatting webpage. Don't insert links to references in the body of the paper.

Writing Style and Final Format

There is no need to use only the passive voice, often encountered in some formal academic journals. It is perfectly acceptable to use the first person “I” when talking about your own artistic endeavors, and the inclusive, academic “we” works well for more formal statements.

To submit your paper via EasyChair [?], you will have to convert it into a PDF (Portable Document Format) file and that file must not exceed 10 MB. Papers will appear in the online Bridges Archives and in print in full color.

Summary and Conclusions

Please adhere to the style incorporated in this template, *except* your paper must end after 2, 4, 6, or 8 pages, *including* references. Substantive deviations from this style are grounds for rejecting your paper without any detailed review.

Acknowledgements

Suggestions on how the clarity and usefulness of this guide could be enhanced would be gladly accepted.

References

- [1] Merrel, Paul. “Example-based model synthesis” *Proceedings of the 2007 Symposium on Interactive 3D Graphics and Games*, 2007, pp.105–112 <https://doi.org/10.1145/1230100.1230119>