LaTeX Template for Preparing a Paper or Report for I524

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This template can be used to prepare a research article for I524. Note that this template can be run from your own TEX system or within the cloud-based Overleaf system or Sharelatex systems.

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Keywords: Cloud, I524

https://github.com/cloudmesh/classes/blob/master/docs/source/format/report/report.pdf

INTRODUCTION

This template is designed to assist with creating an article for I524. The page length is typically done without images. Thus if you have images in your report, please add additional content to offset the space captured by images. We do not check exactly, so there is no reason to contact us if you are a paragraph short, but if you are half a page short you may add quality content.

CHANCE FOR PUBLISHING A PAPER

If this work can lead to a publishable paper, you could engage with the course instructor as coauthor to work more closely with him/them. This however requires that the paper be worked on in a regular basis and that timely contributions from the instructor can be integrated. Hence this is going to be a significant effort and you need to decide if you like to conduct this. Naturally the project must be suitable for such an activity. It may even be that some projects may be combined.

In such cases if the work is sufficient for publication submission, an A+ for the class could be considered. It will be however a lot of work. The length of such a paper is typically 10-12 high quality pages including figures and references. We may elect for the final submission to use a different LaTeX style. As Gregor is an expert in this, changing the format will be simple.

EXAMPLES OF ARTICLE COMPONENTS

The sections below show examples of different article components.

FIGURES AND TABLES

It is not necessary to place figures and tables at the back of the manuscript. Figures and tables should be sized as they are to appear in the final article. Do not include a separate list of figure captions and table titles.

Figures and Tables should be labelled and referenced in the standard way using the `\label{}` and `\ref{}` commands.

Sample Figure

Figure 1 shows an example figure.

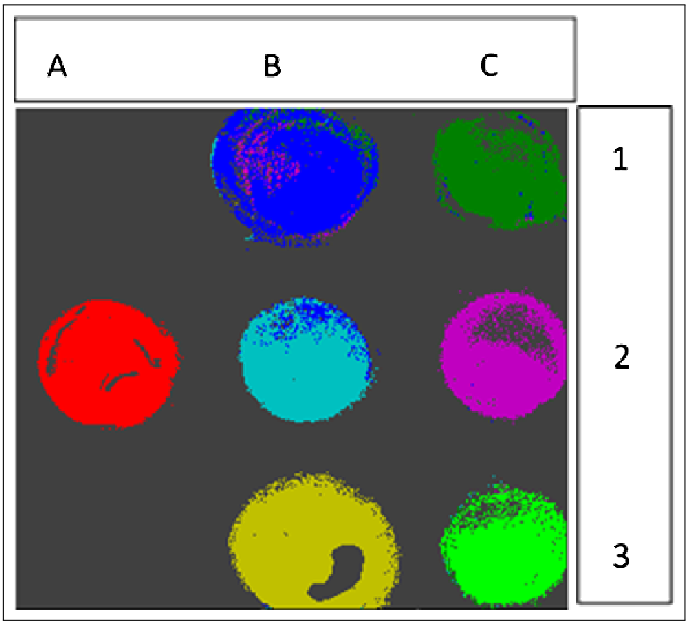


Fig. 1. False-color image, where each pixel is assigned to one of seven reference spectra.

Sample Table

Table 1 shows an example table.

Table 1. Shape Functions for Quadratic Line Elements

local node	$\{N\}_m$	$\{\Phi_i\}_m$ $(i = x, y, z)$
$m = 1$	$L_1(2L_1 - 1)$	Φ_{i1}
$m = 2$	$L_2(2L_2 - 1)$	Φ_{i2}
$m = 3$	$L_3 = 4L_1L_2$	Φ_{i3}

SAMPLE EQUATION

Let $X_1, X_2, \ldots, X_n$ be a sequence of independent and identically distributed random variables with $\mathrm{E}[X_i] = \mu$ and $\mathrm{Var}[X_i] = \sigma^2 < \infty$, and let

$$S_n = \frac{X_1 + X_2 + \cdots + X_n}{n} = \frac{1}{n}\sum_{i}^{n} X_i \qquad \textbf{(1)}$$

denote their mean. Then as n approaches infinity, the random variables $\sqrt{n}(S_n - \mu)$ converge in distribution to a normal $\mathcal{N}(0, \sigma^2)$.

SAMPLE ALGORITHM

Algorithms can be included using the commands as shown in algorithm 1.

Algorithm 1. Euclid's algorithm

```
1: procedure EUCLID(a, b)          ▷ The g.c.d. of a and b
2:     r ← a mod b
3:     while r ≠ 0 do              ▷ We have the answer if r is 0
4:         a ← b
5:         b ← r
6:         r ← a mod b
7:     return b                    ▷ The gcd is b
```

Algorithm 2. Python example

```
for i in range(0,100):
  print i
```

REFERENCE MANAGEMENT

The best programs to manage your references is jabref or emacs. You can edit the references and verify them with them for format errors. To cite them use the citation key. You can add multiple bib files to the bibliography command separated by comma. Add citations with the cite command. See [1] for an example on how to use multiple clouds. In [2] we list the class content.

Here a test of a citation with an underscore in the url [3].

SUPPLEMENTAL MATERIAL

You can include an appendix with important information and additional figures if needed. However they must be referenced and follow the same guidelines as in the main text. All materials must be associated with a figure, table, or equation or be referenced in the results section of the manuscript. (1) 2D and 3D image files and video must be labeled "Visualization," not "Movie," "Video," "Figure," etc. (2) Machine-readable data (for example, csv files) must be labeled "Data File." Number data files and visualizations consecutively, e.g., "Visualization 1, Visualization 2. . . ." (3) Large datasets or code files must be placed in github/gitlab. Such items should be mentioned in the text as either "Dataset" or "Code," as appropriate, and also be cited in the references list. Appropriate citations in jabref as Misc need to be created.

ACKNOWLEDGEMENTS

Funding information should be listed in this section. Please evaluate if you like to list your employer that may have funded your activities here. If you receive grants or project numbers, as shown in the example. This work was in part supported by National Science Foundation (NSF) (1234567, 891012345) (These numbers are invented)

The acknowledgments may also contain any information that is not related to funding:

The authors thank H. Haase, C. Wiede, and J. Gabler for technical support.

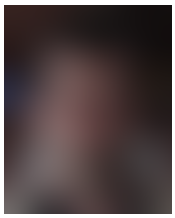
REFERENCES

[1] G. von Laszewski, F. Wang, H. Lee, H. Chen, and G. C. Fox, "Accessing Multiple Clouds with Cloudmesh," in *Proceedings of the 2014 ACM International Workshop on Software-defined Ecosystems*, ser. BigSystem '14. New York, NY, USA: ACM, 2014, pp. 21–28. [Online]. Available: http://doi.acm.org/10.1145/2609441.2609638

[2] Gregor von Laszewski and Badi Abdul-Wahid, "Big Data Classes," Web Page, Indiana University, Jan. 2017. [Online]. Available: https://cloudmesh.github.io/classes/

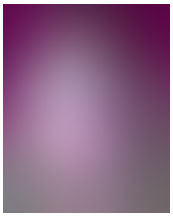
[3] Web Page. [Online]. Available: http://www.google.com/some_underscore

AUTHOR BIOGRAPHIES



John Smith received his BSc (Mathematics) in 2000 from The University of Maryland. His research interests include lasers and optics.

Alice Smith received her BSc (Mathematics) in 2000 from The University of Maryland. Her research interests also include lasers and optics.



Bruce Wayne received his BSc (Aeronautics) in 2000 from Indiana University. His research interests include lasers and optics.

WORK BREAKDOWN

The work on this project was distributed as follows between the authors:

John Smith. Explored the deep mathematical knowledge needed for this paper and taught it to the other authors.

Alice Smith. She explored the world of Oz and was instrumental to work on the deployment of hadoop.

Bruce Wayne. He did not contribute at all to this paper and flew around to safe the world.

REPORT CHECKLIST

- □ Have you written the report in word or LaTeX in the specified format?
- □ Have you included the report in github/lab?
- □ Have you specified the names and e-mails of all team members in your report. E.g. the username in Canvas?
- □ Have you included the HID of all team members?
- □ Does the report have the project number added to it?
- □ Have you included all images in native and PDF format in gitlab in the images folder?
- □ Have you added the bibliography file in bibtex format?
- □ Have you submitted an additional page that describes who did what in the project or report?
- □ Have you spellchecked the paper?
- □ Have you made sure you do not plagiarize?
- □ Have you made sure that the important directories are all lower case and have no underscore or space in it?
- □ Have you made sure that all authors have a README.rst in their HID github/lab repository?
- □ Have you made sure that there is a README.rst in the project directory and that it is properly filled out?
- □ Have you put a work breakdown in the document if you worked in a group?

POSSIBLE TECHNOLOGY PAPER OUTLINE

The next sections are just some suggestions, your may want to add sections and subsections as you see fit. Images and references do not count towards the 2 page length. Please use the `\section`, `\subsection`, and `\subsubsection` commands in your paper. do not introduce hardcoded numbers. Use the `\ref` and `\label` commands to refer to the sections.

Abstract Put in the abstract a summary what this paper is about

1. Introduction Introduce the technology and provide general useful information.

2. Architecture If applicable include a description about architectural details. This may include a figure. Make sure that if you copy a figure you put the [**?**] in the caption also. Otherwise it is plagiarism.

2.1. API comment on the API which could include language bindings

2.2. Shell Access If applicable comment on how the tool can be used from the command line

2.3.Graphical Interface If applicable comment on if the technology has a GUI

3. Licensing Often tools may have different versions, some fre, some for pay. Comment on this. For example while a tool may offer a comercial version this version may be too costly for others. Identify especially the difference between features for free vs commercial tools.

Sometimes you may need to introduce this also in the introduction as there may be a big difference and without the knowledge you do not provide the user an adequate introduction.

4. Ecosystem Some technologies have a large ecosystem developed around them with extensions plugins and other useful tools. Identify if they exists and comment on what they can achieve

provide potentially a mindmap or a figure illustrating how the technology fits in with other technologies if applicable.

4. Use Cases

4.1. Use Cases for Big Data Locate and describe major usecases that demonstrate the technology while focussing on big data related use cases. Make sure you do proper references with the **[?**] command. Do not put URLs in the text.

4.2. Other Use Cases Some technologies may not just be used for big data, find other makor use cases from other areas if applicable. Make sure you do proper references with the **[?**] command. Do not put URLs in the text.

5. Educational material Put information here how someone would find out more about the technology. Use important material and do not list hundrets of web pages, be selective.

6. Conclusion Put in some conclusion based on what you have researched

Acknowledgement Put in the information for this class and who may sponsor you. Examples will be given later