

How to write an amazing article

Adam Herout*

Abstract

What is the problem? What is the topic? The aim of this paper? Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce ullamcorper suscipit euismod. Mauris sed lectus non massa molestie congue. In hac habitasse platea dictumst. How is the problem solved, the aim achieved (methodology)? Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce ullamcorper suscipit euismod. Mauris sed lectus non massa molestie congue. In hac habitasse platea dictumst. Curabitur massa neque, commodo posuere fringilla ut, cursus at dui. Nulla quis purus a justo pellentesque. What are the specific results? How well is the problem solved? Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce ullamcorper suscipit euismod. Mauris sed lectus non massa molestie congue. In hac habitasse platea dictumst. So what? How useful is this to Science and to the reader? Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce ullamcorper suscipit euismod.

Keywords: Keyword1 — Keyword2 — Keyword3

Supplementary Material: [Demonstation video](#) — [Downloadable code](#)

*herout@fit.vut.cz, Faculty of Information Technology, Brno University of Technology

1. Introduction

[Motivation] What is the raison d'être of your project? Why should anyone care? No general meaningless claims. Make bulletproof arguments for the importance of your work. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Integer sit amet neque vel mi sodales interdum nec a mi. Aliquam eget turpis venenatis, tincidunt purus eget, euismod neque. Nulla et porta tortor, id lobortis turpis. Sed scelerisque sem eget ante interdum, vel volutpat arcu volutpat.

[Problem definition] What exactly are you solving? What is the core and what is a bonus? What parameters should a proper solution of the problem have? Define the problem precisely and state how its solution should be evaluated. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque non arcu quis nunc efficitur vestibulum. Integer gravida neque suscipit diam porta aliquet. Maecenas porttitor libero ut turpis porttitor, auctor porta ligula rhoncus. Etiam a turpis blandit, eleifend dolor eget, egestas ligula. Nullam sollicitudin pulvinar mi sit amet in-

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[Existing solutions] Discuss existing solutions, be fair in identifying their strengths and weaknesses. Cite important works from the field of your topic. Try to define well what is the *state of the art*. You can include a Section 2 titled "Background" or "Previous Works" and have the details there and make this paragraph short. Or, you can enlarge this paragraph to a whole page. In many scientific papers, *this* is the most valuable part if it is written properly. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent congue enim eu eros dictum sagittis. Aliquam ligula arcu, gravida at augue et, aliquet condimentum nulla. Morbi a lectus arcu. Nam ac commodo nisi, a accumsan nunc. Nam sed ante vel nulla elementum lobortis. Aliquam sed laoreet risus. Etiam ipsum odio, gravida

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[Our solution] Make a quick outline of your approach – pitch your solution. The solution will be described in detail later, but give the reader a very quick overview now. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi laoreet risus a egestas imperdiet. Ut egestas nibh non fermentum vestibulum. Nullam quis eleifend ex, sed maximus nisl. Mauris maximus non dolor id tristique. Nunc pulvinar congue gravida. Nullam lobortis viverra leo sed commodo. Nulla in elit congue, ullamcorper metus non, eleifend risus. Vivamus porttitor, ex nec porttitor pretium, libero turpis ultrices dui, eu efficitur ante ipsum vel justo. Vivamus nec nulla nisi. Aenean quis mauris vitae metus gravida congue.

[Contributions] Sell your solution. Pinpoint your achievements. Be fair and objective. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Integer sit amet neque vel mi sodales interdum nec a mi. Aliquam eget turpis venenatis, tincidunt purus eget, euismod neque. Nulla et porta tortor, id lobortis turpis. Sed scelerisque sem eget ante interdum, vel volutpat arcu volutpat. Aliquam cursus, dolor a luctus.

2. How To Use This Template

Here will go several sections describing **your work**. From theoretical background (Section 2), through your own methodology (Section 3), experiments and implementation (Section 4 and possibly 5), to conclusions (Section 6). Instead of such technical content, here in this template we give a few hints how to write the paper.

Here is a list of actions to do first when you want to write an project practice paper:

1. Download all the template files (Sec. 2.1) into a directory. Maybe setup a GIT sync for backup, sharing, and for use from multiple computers.
2. Rename *2019-PPFIT-ShortName.tex* (the main template file) – replace ShortName with something that identifies your work and is short enough. For example: *VehicleBoxes*, *VanishingPoints*, *FastShadows*, *NewProbeTesting*, *CheapDynamicDNS*, ... This ensures that the filename already



Figure 1. Good writing is bad writing that was rewritten several times. Don't worry, start somewhere.

- gives a hint what is in there (*mypaper.pdf* is really stupid).
3. Decide the language of your paper. English is recommended, as it is the language of science and technology. However, if you want to write in Czech or Slovak, you may. Use the correct option to the `\documentclass` command – the very first line of the template. The option may be either `[czech]` or `[slovak]`, if you want to write in English, do not use any parameters.
4. Insert meta information: **your name, email, paper title**. Do not hesitate to use `ěščřžýáíé` in your name – the \LaTeX template is configured to eat UTF8 Unicode. Also check that the correct accademic year is specified (the `\PPYear` command in the main template file).
5. Insert teaser images (“image abstract”). Use as many `\TeaserImage` commands as suitable – three or four will usually be fine for a one-line teaser. If you absolutely don't have any image showing your work (what kind of work could that be, anyway?!), remove the `\Teaser` command.
6. Insert references to supplementary material. That will typically be clickable links to a YouTube / Vimeo video and to downloadable code, hyperlink to an online demo, or a Github repository. If you have anything else relevant, put it in. If there is no supplementary material (really?!), remove or comment out the `\Supplementary` command.
7. Keep calm and start writing (Figure 1). Some suggestions how to do this are in Section 3.
8. After fixing the paper based on the recommendations of your supervisor, uncomment the `\PPFinalCopy` command in the main template file. The line

128 numbering will be removed and the paper will
129 be ready for submission.

130 Jean-Luc Lebrun [3] offers excellent recommenda-
131 tions for the canonical sections of scientific/technical
132 papers. That is why Abstract, Introduction, and Con-
133 clusions in this template are already structured (re-
134 move the [Bold labels] in the Introduction and Con-
135 clusions, they are there just for your information and
136 should not remain in the paper). This structure is no
137 more than a recommendation, but divert from it only
138 in cases when you exactly know what you are doing.
139 The “phony” texts (typeset in gray color) roughly in-
140 dicate the lengths of individual parts of these sections.
141 Replace them with reasonable amounts of text.

142 2.1 What Files are Here and Why

143 This package (based on the Excel@FIT conference
144 package and KNOT paper package) contains these
145 files:

146 **2019-PPFIT-ShortName.tex** This is the template for
147 the main L^AT_EX file. Do yourself a favor and re-
148 place *ShortName* in the filename with something
149 meaningful.

150 **2019-PPFIT-ShortName-text(-en).tex** This is the file
151 containing the text of your paper in L^AT_EX –
152 this is your paper. Do yourself a favor and re-
153 place *ShortName* in the filename with something
154 meaningful. If you want to write the paper in
155 English, use the file with -en in the name.

156 **2016-KNOTFIT-ShortName-bib.bib** You can delete
157 the contents of this file completely and start
158 adding BibTeX references. It is much easier
159 to use a small editing tool (Section 4, JabRef)
160 than to format .bib file manually. Rename the
161 file so that *ShortName* is consistent with the pre-
162 vious files (and update the filename in the .tex
163 file).

164 **PPFIT.cls** L^AT_EX class file based on the *Stylish Arti-*
165 *cle*¹ document class. Do not modify this file.

166 **VUT-FIT-logo.pdf** Another logo on the title page.

167 **images/placeholder.pdf** Placeholder image; include
168 it, scale it as needed, then replace it with real
169 content.



170
171 **images/keep-calm.png** You don’t need this file; it
172 is only used in this template to show how to
173 include a .png file (Figure 1).

¹<http://www.latextemplates.com/template/stylish-article>

3. How To Write the Paper — A Few Hints 174

A reasonable way to start writing is sketching the **ab-**
stract [2]. Writing the abstract helps focus on what
is important in the paper, what is the contribution, the
meaning for the community. This exercise might take
some 20 minutes and it pays back by clearing the key
points of the text. In 99 % cases it is very reasonable
to stick to the abstract structure [3] which is provided
in this template.

Once you have the abstract, it should be very clear
what is the message of the paper, what is the newly
introduced knowledge, what are the proofs of its contri-
bution, etc. This is the right time to start constructing
the *skeleton* of the paper: it’s **comics edition** [1]. This
thing is composed of mainly four items:

1. **Sections and subsections.**
2. **Figures and tables.** At this phase, knowing
that “once there will be a figure about this and
that” is just fine. That is why we have the *place-*
holder.pdf image – see Figure 2. If this totally
generic image can be replaced by some tempo-
rary image which still needs more work, but
which is closer to the target version, go ahead.
A hand-drawing photographed by a cellphone is
perfect at this stage.
3. **Todo’s.** In the early comics version, every sec-
tion is filled by one or more `\todo` commands
and nothing else. A todo in the text might look
like: **[[you should do something]]**. Unlike some
elaborated todo packages, this simple solution
(defined in the template) does not break the page
formatting and it is perfectly sufficient.
4. **Phony placeholder texts.** These help you esti-
mate the proportions of individual sections and
subsections and to better aim at the correct paper
length. Use `\blind{3}` to get three paragraphs of
beautiful grey phony text.

One hour is usually enough for creating a nice comics
edition of the paper. No reason to wait, make a copy
of the template and start butchering it.

Having the comics edition usually lubricates the
whole writing process. Now, the paper contains 20 or
so todo’s – why not take the easiest one of them and
replace it with a few lines of text within 15 minutes or
even less. Writing is no more a scary complex work.

3.1 Images and Tables 219

Visuals (figures, tables, good equations, section head-
ings) make the skeleton of a properly written paper.
A time-stressed reader should be able to get the idea
from only browsing them. Therefore:

- 224 1. **Make them perfect.** Cheap and ugly images –
225 cheap and ugly paper. Imperfect or shorter text –
226 who cares?
- 227 2. **Make them self-contained.** Be not afraid to
228 have a ten-lines-long caption under an image.
229 The image plus its caption must make perfect
230 sense by themselves, without reading the text.
- 231 3. **Make them many.** EVERY technical idea is
232 better explained by an image. Two images per
233 page are a moderate start.

234 L^AT_EX lets you easily insert both vector and raster
235 graphics. It is reasonable to use three formats:

.pdf Perfect for vector graphics. All graphs **must** be in vector and therefore in .pdf. Gnuplot, Pyplot, Matlab – they all produce vector graphs in .pdf easily. Diagrams, system structures, sketches – all vector graphics. It's 2019, not 1980 anymore...

242 **.jpg** Suitable for photos. **Never** for plots or screen-
243 shots.

244 **.png** Good for precise raster graphics. Screenshots,
245 raster plots, raster outputs of programs. Not for
246 diagrams and plots – unless it is a one-in-ten-
247 years exception.

248 Caption of a table goes **before** the table (e.g. Table 1),
249 just the opposite way than with figures. There is no
250 logic behind, that's just how it is.

251 3.2 Sections and Subsections

It is usually wrong to have subsections in the Introduction; it is always wrong to have them in Conclusions. In this kind of paper, it is very likely to be wrong to have any subsubsections.

Section headings are the skeleton of the paper – make them accurate and descriptive. One-word section titles (apart from Introduction and Conclusions) are typically wrong, because they are not descriptive. “Proposed Method for Running X by Using Y” is better than “The Method”. “Implemented Application for PQR Communication” is better than “Application”. The outline of all section titles should contain all the keywords relevant for the work. Just by seeing them, the reader should be able to tell precisely the topic of the paper. If not, the section headers are wrong (usually too short and generic).

268 3.3 Keywords

269 Keywords are specified at the top of the document.

1. When making the list of keywords, ask yourself this: “What should one write to Google, so that the right answer would be my paper?”

2. Very generic terms (“IT”, “Graphics”, “Hardware”) are useless. Narrow terms are fine (“Matrix Code Recognition”, “Appearance-Based Vehicle Segmentation”, . . .)

4. Some Useful Tools

This list is not a list and it is by no means complete. If
you prefer other tools – cool, stick with them. If you
are just beginning, consider these.

MikTeX Problem-free L^AT_EX for Windows; a distribu- 281
tion with perfect automation of package down- 282
load. Single setup, no more worries. 283

TeXstudio Portable and opensource GUI for \LaTeX writing. Ctrl+click jumps from PDF to \LaTeX and back. Integrated spellchecker, syntax highlighting, multifile projects, etc. First, install MikTeX, then TeXstudio. Ten minutes and you are a \LaTeX master.

JabRef Nice and simple Java program for managing
.bib files with references. Not much to learn –
 one window, a straightforward form for editing
 the entries.

Inkscape Opensource and portable editor of vector files (SVG and – conveniently – PDF). The proper tool for making great drawings for papers – not the easiest to learn, though.

GIT	Great for team collaboration on L ^A T _E X projects,	298
	but also helpful to a single author – for version-	299
	ing, backup, multi-computer, ...	300

Overleaf Online L^AT_EX editing (FIT BUT have an institutional license) – some love it, to others it might seem a little too slow, though...

5. Frequently Used \LaTeX Fragments

Here goes an example of a table:

Table 1. Table of Grades

Name		
First name	Last Name	Grade
John	Doe	7.5
Richard	Miles	2

Figure 2 shows a wide figure, Figure 1 is a single-column figure with width specified relatively to the column. Some mathematics $\cos \pi = -1$ and α in the text².

Now, this is an equation:

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

²And some mathematics $\cos \pi = -1$ and α in a footnote.



Figure 2. Wide Picture. The whole figure can be composed of several smaller images. If you want to address individual images in the caption or from the text, use the *subcaption* package.

and here is a bunch of equations aligned horizontally:

$$3x = 6y + 12 \quad (2)$$

$$x = 2y + 4 \quad (3)$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

6. Conclusions

[Paper Summary] What was the paper about, then? What the reader needs to remember about it? Lorem ipsum dolor sit amet, consectetur adipiscing elit. Proin vitae aliquet metus. Sed pharetra vehicula sem ut varius. Aliquam molestie nulla et mauris suscipit, ut commodo nunc mollis.

[Highlights of Results] Exact numbers. Remind the reader that the paper matters. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed tempus fermentum ipsum at venenatis. Curabitur ultricies, mauris eu ullamcorper mattis, ligula purus dapibus mi, vel dapibus odio nulla et ex. Sed viverra cursus mattis. Suspendisse ornare semper condimentum. Interdum et malesuada fames ac ante ipsum.

[Paper Contributions] What is the original contribution of this work? Two or three thoughts that one should definitely take home. Lorem ipsum dolor sit

amet, consectetur adipiscing elit. Praesent posuere mattis ante at imperdiet. Cras id tincidunt purus. Aliquam erat volutpat. Morbi non gravida nisi, non iaculis tortor. Quisque at fringilla neque.

[Future Work] How can other researchers / developers make use of the results of this work? Do you have further plans with this work? Or anybody else? Lorem ipsum dolor sit amet, consectetur adipiscing elit. Suspendisse sollicitudin posuere massa, non convallis purus ultricies sit amet. Duis at nisl tincidunt, maximus risus a, aliquet massa. Vestibulum libero odio, condimentum ut ex non, eleifend.

Acknowledgements

I would like to thank my supervisor X. Y. for his help.

References

- [1] HEROUT, A. *Diplomka / Comics Edition* [blogpost (czech)]. Březen 2013. Dostupné z: <http://www.herout.net/blog/2013/03/diplomka-comics-edition/>.
- [2] HEROUT, A. *Jak psát abstrakt* [blogpost (czech)]. Prosinec 2013. <http://www.herout.net/blog/2013/12/jak-psat-abstrakt/>. Dostupné z: <http://www.herout.net/blog/2013/12/jak-psat-abstrakt/>.
- [3] LEBRUN, J.-L. *Scientific Writing 2.0: a reader and writer's guide*. 2. vyd. World Scientific Publishing, 2011. ISBN 9814350605.