

# How to Write an Excellent Excel@FIT Paper

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:** [Demonstration Video](#) — [Downloadable Code](#)

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## 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 interdum. Etiam in ultrices ante. Suspendisse potenti. Duis vel nisi eget tellus volutpat tempor. Etiam laoreet magna elit, et sollicitudin lectus tempor sit. Maecenas porttitor libero ut turpis porttitor, auctor porta ligula rhoncus. Etiam a turpis blandit, eleifend dolor eget, egestas ligula.

**[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

35 whole page. In many scientific papers, *this* is the most  
 36 valuable part if it is written properly. Lorem ipsum  
 37 dolor sit amet, consectetur adipiscing elit. Praesent  
 38 congue enim eu eros dictum sagittis. Aliquam ligula  
 39 arcu, gravida at augue et, aliquet condimentum nulla.  
 40 Morbi a lectus arcu. Nam ac commodo nisi, a accum-  
 41 san nunc. Nam sed ante vel nulla elementum lobortis.  
 42 Aliquam sed laoreet risus. Etiam ipsum odio, gravida  
 43 eget sapien dictum, eleifend aliquet ex. Duis dapibus  
 44 vitae enim vitae bibendum. Phasellus eget pulvinar  
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 46 ut turpis porttitor, auctor porta ligula rhoncus. Etiam a  
 47 turpis blandit, eleifend dolor eget, egestas ligula. Nul-  
 48 lam sollicitudin pulvinar mi sit amet interdum. Etiam  
 49 in ultrices ante. Suspendisse potenti. Duis vel nisi eget  
 50 tellus volutpat tempor. Suspendisse potenti. Duis vel  
 51 nisi eget tellus volutpat tempor.

52 **[Our solution]** Make a quick outline of your ap-  
 53 proach – pitch your solution. The solution will be  
 54 described in detail later, but give the reader a very  
 55 quick overview now. Lorem ipsum dolor sit amet, con-  
 56 sectetur adipiscing elit. Morbi laoreet risus a egestas  
 57 imperdiet. Ut egestas nibh non fermentum vestibulum.  
 58 Nullam quis eleifend ex, sed maximus nisl. Mauris  
 59 maximus non dolor id tristique. Nunc pulvinar congue  
 60 gravida. Nullam lobortis viverra leo sed commodo.  
 61 Nulla in elit congue, ullamcorper metus non, eleifend  
 62 risus. Vivamus porttitor, ex nec porttitor pretium,  
 63 libero turpis ultrices dui, eu efficitur ante ipsum vel  
 64 justo. Vivamus nec nulla nisi. Aenean quis mauris  
 65 vitae metus gravida congue.

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

## 74 2. How To Use This Template

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

82 Here is a list of actions to do first when you want  
 83 to write an Excel@FIT paper:

- 84 1. Download all the template files (Sec. 2.1) into a  
 85 directory. Maybe setup a GIT sync for backup,



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

- sharing, and for use from multiple computers. 86
2. Rename *2019-ExcelFIT-ShortName.tex* – replace 87  
 ShortName with something that identifies your 88  
 work and is short enough. For example: *Vehicle-* 89  
*Boxes*, *VanishingPoints*, *FastShadows*, *NewPro-* 90  
*beTesting*, *CheapDynamicDNS*, ... This ensures 91  
 that the filename already gives a hint what is in 92  
 there (*mypaper.pdf* is really stupid). 93
3. Decide the language of your paper. English is 94  
 recommended, as it is the language of science 95  
 and technology. However, if you want to write 96  
 in Czech or Slovak, you may. Use the correct 97  
 option to the `\documentclass` command – the 98  
 very first line of the template. The option may 99  
 be either `[czech]` or `[slovak]`. 100
4. Insert meta information: **your name, e-mail,** 101  
**paper title**. Make sure the year in the top right 102  
 corner of the document is correct. Do not hes- 103  
 itate to use `ěščžýáíé` in your name – the L<sup>A</sup>T<sub>E</sub>X 104  
 template is configured to eat UTF8 Unicode. 105
5. Insert teaser images (“image abstract”). Use 106  
 as many `\TeaserImage` commands as suitable 107  
 – three or four will usually be fine for a one- 108  
 line teaser. If you absolutely don't have any 109  
 image showing your work (what kind of work 110  
 could that be, anyway?!), remove the `\Teaser` 111  
 command. 112
6. Insert references to supplementary material. That 113  
 will typically be clickable links to a youtube / 114  
 vimeo video and to downloadable code, hyper- 115  
 link to an online demo, or a github repo. If you 116  
 have anything else relevant, put it in. If there is 117  
 no supplementary material (really?!), remove or 118  
 comment out the `\Supplementary` command. 119
7. Keep calm and start writing (Figure 1). Some 120

121 suggestions how to do this are in Section 3.  
 122 8. When your paper is accepted to Excel@FIT, un-  
 123 comment `\ExcelFinalCopy` at the beginning of  
 124 this file. The line numbers will disappear from  
 125 the sides of the text and your paper is ready for  
 126 final publication.

127 Jean-Luc Lebrun [1] offers excellent recommen-  
 128 dations for the canonical sections of scientific/techni-  
 129 cal papers. That is why Abstract, Introduction, and  
 130 Conclusions in this template are already structured  
 131 (remove the **[Bold labels]** in the Introduction and Con-  
 132 clusions, they are there just for your information and  
 133 should not remain in the paper). This structure is no  
 134 more than a recommendation, but divert from it only  
 135 in cases when you exactly know what you are doing.  
 136 The “phony” texts (typeset in gray color) roughly in-  
 137 dicate the lengths of individual parts of these sections.  
 138 Replace them with reasonable amounts of text.

## 139 2.1 What Files are Here and Why

140 The template package for Excel@FIT papers contains  
 141 these files:

142 **2019-ExcelFIT-ShortName.tex** This is the template  
 143 for the main L<sup>A</sup>T<sub>E</sub>X file – this is your paper. Do  
 144 yourself a favor and replace *ShortName* in the  
 145 filename with something meaningful.

146 **2019-ExcelFIT-ShortName-bib.bib** You can delete  
 147 the contents of this file completely and start  
 148 adding BibTeX references. It is much easier  
 149 to use a small editing tool (Section 4, JabRef)  
 150 than to format *.bib* file manually. Rename the  
 151 file so that *ShortName* is consistent with the pre-  
 152 vious file (and update the filename in the *.tex*  
 153 file).

154 **ExcelAtFIT.cls** L<sup>A</sup>T<sub>E</sub>X class file based on the *Stylish*  
 155 *Article*<sup>1</sup> document class. Do not modify this file.

156 **ExcelAtFIT-logo.pdf** This is the logo on the title page.

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

158 **images/placeholder.pdf** Placeholder image; include  
 159 it, scale it as needed, then replace it with real  
 160 content.



161 **images/keep-calm.png** You don’t need this file; it  
 162 is only used in this template to show how to  
 163 include a *.png* file (Figure 1).  
 164

## 3. How To Write the Paper — A Few Hints 165

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 [1] 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** [3]. This  
 thing is composed of mainly four items:

1. **Sections and subsections.** 180
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. 189
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. 196
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. 201

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 210

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:

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

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1. **Make them perfect.** Cheap and ugly images – cheap and ugly paper. Imperfect or shorter text – who cares?

2. **Make them self-contained.** Be not afraid to have a ten-lines-long caption under an image. The image plus its caption must make perfect sense by themselves, without reading the text.

3. **Make them many.** EVERY technical idea is better explained by an image. Two images per page are a moderate start.

L<sup>A</sup>T<sub>E</sub>X lets you easily insert both vector and raster 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...

**.jpg** Suitable for photos. **Never** for plots or screenshots.

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

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

**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).

**3.3 Keywords**

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.

**Overleaf** Online L<sup>A</sup>T<sub>E</sub>X editing – if you don’t want to install and learn many tools, Overleaf is a great solution: works online and allows sharing your text with your supervisor. Unless there are very good reasons for not doing so, stick to Overleaf.

**MikTeX** Problem-free L<sup>A</sup>T<sub>E</sub>X for Windows; a distribution with perfect automation of package download. Single setup, no more worries.

**TeXstudio** Portable and opensource GUI for L<sup>A</sup>T<sub>E</sub>X 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 L<sup>A</sup>T<sub>E</sub>X 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<sup>A</sup>T<sub>E</sub>X projects, but also helpful to a single author – for versioning, backup, multi-computer, ...

**5. Frequently Used L<sup>A</sup>T<sub>E</sub>X Fragments**

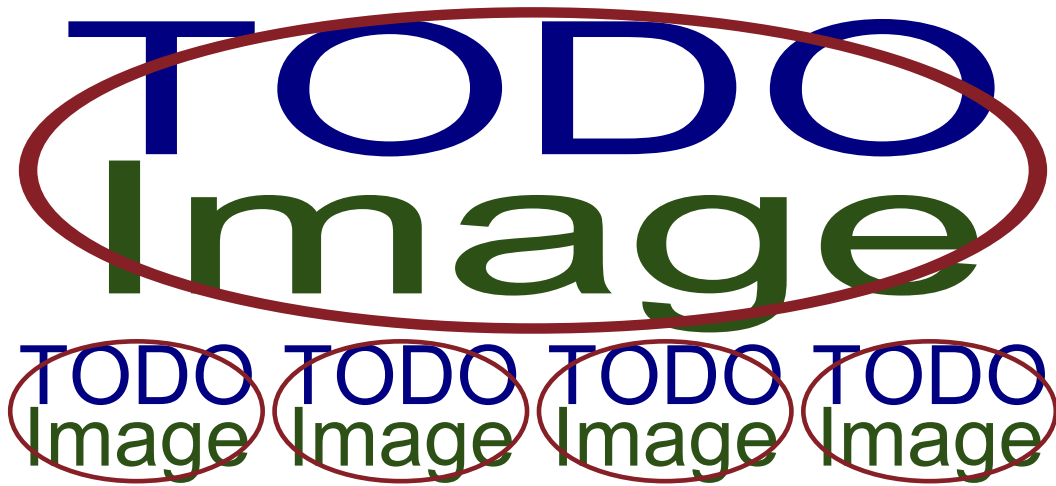
Here goes an example of a table:

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  $\alpha$  in the text<sup>2</sup>.

<sup>2</sup>And some mathematics  $\cos \pi = -1$  and  $\alpha$  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.

303 Now, this is an equation:

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

304 and here is a bunch of equations aligned horizontally:

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

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

305 In programming, longer and more descriptive identifiers are better:

```
307 volume = width * height * length
308 if volume > volume_max:
309     print "That's too much material!"
```

310 but the same is **wrong** in mathematical writing and in papers and single-letter identifiers are to be used:

$$V = w \times h \times l, \quad (4)$$

$$\delta(V) = V > \tau_V \quad (5)$$

312 identifiers composed of more than one letters are meaningful only in rare cases such as  $V_{\max}$  or  $t_{\text{start}}$ . Often-  
313 times it makes sense to define one's own reasonable  
314 notation by using accents:  
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$$\bar{x} = \frac{\sum_{x_i \in X} x_i}{|X|}. \quad (6)$$

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

## 6. Conclusions

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[Paper Summary] What was the paper about, then? 329  
What the reader needs to remember about it? Lorem 330  
ipsum dolor sit amet, consectetur adipiscing elit. Proin 331  
vitae aliquet metus. Sed pharetra vehicula sem ut var- 332  
ius. Aliquam molestie nulla et mauris suscipit, ut 333  
commodo nunc mollis. 334

[Highlights of Results] Exact numbers. Remind 335  
the reader that the paper matters. Lorem ipsum do- 336  
lor sit amet, consectetur adipiscing elit. Sed tempus 337  
fermentum ipsum at venenatis. Curabitur ultricies, 338  
mauris eu ullamcorper mattis, ligula purus dapibus mi, 339  
vel dapibus odio nulla et ex. Sed viverra cursus mattis. 340  
Suspendisse ornare semper condimentum. Interdum et 341  
malesuada fames ac ante ipsum. 342

[Paper Contributions] What is the original con- 343  
tribution of this work? Two or three thoughts that one 344  
should definitely take home. Lorem ipsum dolor sit 345  
amet, consectetur adipiscing elit. Praesent posuere 346  
mattis ante at imperdiet. Cras id tincidunt purus. Ali- 347  
quam erat volutpat. Morbi non gravida nisi, non iaculis 348  
tortor. Quisque at fringilla neque. 349

[Future Work] How can other researchers / devel- 350  
opers make use of the results of this work? Do you 351  
have further plans with this work? Or anybody else? 352  
Lorem ipsum dolor sit amet, consectetur adipiscing 353  
elit. Suspendisse sollicitudin posuere massa, non con- 354  
vallis purus ultricies sit amet. Duis at nisl tincidunt, 355  
maximus risus a, aliquet massa. Vestibulum libero 356  
odio, condimentum ut ex non, eleifend. 357

## Acknowledgements

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I would like to thank my supervisor X. Y. for his help. 359

## 360 References

- 361 [1] Jean-Luc Lebrun. *Scientific Writing 2.0: a reader*  
362 *and writer's guide*. World Scientific Publishing,  
363 2011. ISBN: 9814350605.
- 364 [2] Adam Herout. Jak psát abstrakt. blogpost (czech),  
365 Dec 2013. [http://www.herout.net/](http://www.herout.net/blog/2013/12/jak-psat-abstrakt/)  
366 [blog/2013/12/jak-psat-abstrakt/](http://www.herout.net/blog/2013/12/jak-psat-abstrakt/).
- 367 [3] Adam Herout. Diplomka / comics edi-  
368 tion. blogpost (czech), March 2013.  
369 [http://www.herout.net/blog/2013/](http://www.herout.net/blog/2013/03/diplomka-comics-edition/)  
370 [03/diplomka-comics-edition/](http://www.herout.net/blog/2013/03/diplomka-comics-edition/).