

# Your Title\*

Your Name<sup>†</sup>

April 18, 2018

## Abstract

This is the abstract. An abstract is a short summary that tells a potential reader quickly what you are doing allowing him to judge whether to read your paper or not. (abstract length is  $\approx$  100 words for a normal length paper)

## 1. Introduction

This document can be used as a template (in this case you want to delete all my text from here to the `\bibliographystyle{chicago}` command. In the following, I will give some examples of how to cite and reference, and how to use mathematics in  $\text{\LaTeX}$ .<sup>1</sup> I assume that you have read the “Getting started” part of the  $\text{\LaTeX}$  wikibook, see <https://en.wikibooks.org/wiki/LaTeX>.

### 1.1. Literature Review

Some examples of citations in  $\text{\LaTeX}$  using BibTeX: The “Chicago view” of privacy is based on Stigler (1980) and Posner (1981). A page in a book is cited as Solove (2010, p. 34).

All the cited articles, books etc. have to have an entry in the .bib file where you define the label used for citing and store all the information necessary for creating the reference list at the end of the document. You can usually copy and paste the entries for the .bib file from Google Scholar or JSTOR with occasional minor editing (and otherwise you do it by hand following Martin Osborne’s guide; <https://www.economics.utoronto.ca/osborne/>

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\*If necessary, you can – at this very point – thank someone for his great comments to earlier versions of the paper.

<sup>†</sup>In many papers you will see here the affiliation of the authors.

<sup>1</sup>Ideally, you should look at the .pdf and the .tex file at the same time to see what the code generates.

latex/BIBTEX.HTM). To tell L<sup>A</sup>T<sub>E</sub>X that there is a .bib file, you need to use the `\bibliography{name .bib file}` command at the point where you want to have the reference list; see the end of this document. The layout of the reference list is determined by the `\bibliographystyle{}` command; in this document I use the style “chicago”.

The advantage of BibTeX is twofold: First, you spell the author names and the publication years correctly. Second, the reference list is automatically generated and formatted nicely.

Do not forget to run BibTeX (unless you like question marks instead of citations all over your document). To get the full output:

1. run L<sup>A</sup>T<sub>E</sub>X
2. run BibTeX
3. run L<sup>A</sup>T<sub>E</sub>X twice.<sup>2</sup>

## 2. Maths

Mathematics within a line of text is put between \$ marks. For example, `$$\frac{3}{4}$$` yields the fraction  $\frac{3}{4}$  or `$$\lim_{x \rightarrow \infty} e^{-x} = 0$$` is generated by `$$\lim_{x \rightarrow \infty} e^{-x} = 0$$`. Subindices as in  $x_1$  are written as `$$x_1$$`. Here is how you use math environments:

**Definition 1** (Fixed Point). *Let  $f : D \rightarrow R$  where  $D \subseteq R$ . If  $f(x) = x$ , then  $x$  is called a fixed point of  $f$ .*

You reference the definition as “definition 1” (that is `definition \ref{def:fp}` in the source file where `def:fp` is the label of the definition above). Similarly, you can reference sections as `section \ref{sec:intro}` which yields “section 1”. Also subsection 1.1 can be referenced using `subsection \ref{sec:literature}`. The advantage of such references over writing “section 1.1” directly is that your references will automatically adjust if you change something in the structure of your document; for example, if you insert another section. (Note that you have to compile L<sup>A</sup>T<sub>E</sub>X twice before it gets a new reference properly formatted.)

Important (or long) equations can be displayed in an own line (and maybe numbered and referenced) like so:

$$x^2 + px + q = 0,$$

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<sup>2</sup>You do not have to run BibTeX again afterwards unless you insert a new citation.

$$x_{1/2} = \frac{p}{2} \pm \sqrt{(p/2)^2 - q}. \quad (1)$$

## 2.1. Results

A mathematical result, like a proposition or a lemma, is written in a similar environment as a definition.

**Proposition 1.** *Let  $f : [0, 1] \rightarrow [0, 1]$  be an increasing function. Then,  $f$  has a fixed point.*

## 3. Extensions

This section gives examples of specialized uses that are probably unimportant if you try  $\LaTeX$  for the first time.

### 3.1. Importing graphics

You can include a graphic with the command `\includegraphics{filename}` if the graphic is in the same folder as your `.tex` document (recommended file formats are `png`, `eps` or `pdf`). Usually it is a good idea to place the graphic in a “figure environment” as here.

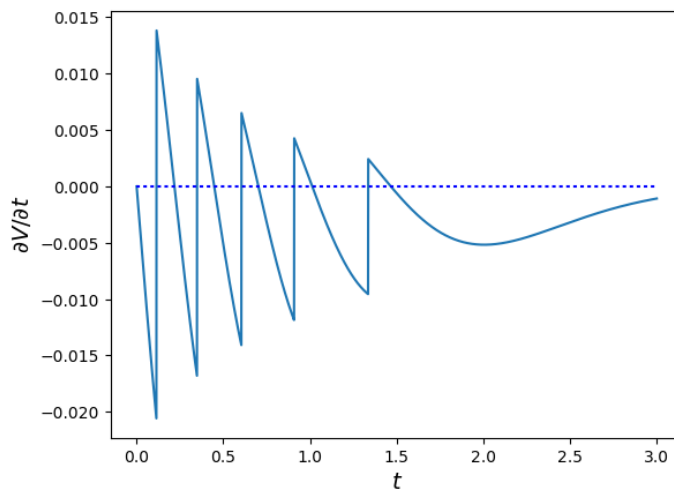


Figure 1: A nice figure

We can reference the figure as figure 1 using its label. Note that  $\LaTeX$  will place the figure at the top of the next page if there is not enough space on the current page (while moving the text that seemingly follows the figure in the `.tex` file to fill up the remaining space).

### 3.2. Tables

Sometimes you need to have a nicely formatted table. I will give only a simple example and you can check <https://en.wikibooks.org/wiki/LaTeX/Tables> if you need something more complicated. The table itself is created in a “tabular environment”. In order to give the table a caption and to be able to reference it, the tabular environment is put into a “table environment”.

top left	top center	top right
mid left	mid center	mid right
bottom left	bottom center	bottom right

Table 1: A simple table

### 3.3. Generating graphics

If you need to create nice looking graphs, something like figure 1 for example, you can produce these inside your L<sup>A</sup>T<sub>E</sub>X document using a package called “tikz” (do not forget to add `\usepackage{tikz}` to the preamble if you want to try). Jacques Crémer wrote an excellent introduction to tikz; see <http://cremeronline.com/LaTeX/minimaltikz.pdf>.

### 3.4. More maths

Putting two equations nicely formatted one below the other.

$$\alpha_h^+ = \frac{\alpha p}{(1 - \alpha)/2 + \alpha p} \quad (2)$$

$$\alpha_h^- = \frac{\alpha(1 - p)}{(1 - \alpha)/2 + \alpha(1 - p)}. \quad (3)$$

Sometimes an equation is too long to be displayed on a single line.

$$\begin{aligned} & \frac{3}{4} \left( \frac{\beta + \gamma}{\rho} + \theta e^\eta \right)^3 + \left( \frac{\beta + \gamma}{\rho} + \theta e^\eta \right)^3 \\ & = \sqrt{x} + \mathbb{E}_\theta [\log(\theta) * \sigma^2] + \frac{3 + 1}{x} + \frac{\alpha - \frac{2+p}{5}}{(1 - \alpha)/2 + \alpha(1 - p)}. \quad (4) \end{aligned}$$

The first line of the previous equation also illustrates when to use normal paranthesis like “(…)” and when you need the command “`\left(...\right)`” (the latter adjusts the size of the paranthesis).

If you do not reference an equation later on, there is no point in having it numbered.

$$\begin{aligned}\alpha_h^+ &= \frac{\alpha p}{(1-\alpha)/2 + \alpha p} \\ \alpha_h^- &= \frac{\alpha(1-p)}{(1-\alpha)/2 + \alpha(1-p)}\end{aligned}\tag{5}$$

and for a single equation

$$\alpha_h^+ = \frac{\alpha p}{(1-\alpha)/2 + \alpha p}.$$

### 3.4.1. Occasionally used symbols

$\sim, \equiv, \approx,$

$\Rightarrow, \Leftrightarrow, \nearrow,$

$\succ, \preceq, \succ, \prec,$

$\Re, \mathbb{R}, \mathbb{N}, \in, \emptyset, \{\}$

$\hat{\alpha}_i, \bar{\alpha}^2, \underline{\alpha}$

### 3.5. Special characters and symbols

In case there are problems with typing special characters, here is how you can generate them directly:

Sørensen, æ, å, Øster, Å, Æ

Müller, ö, ä, Öfter, Ü, Ä

é, è, ô, ç, à

45°, \$, &, #

## 4. Conclusion

All scientific writing should be done in L<sup>A</sup>T<sub>E</sub>X.

## Appendix

**Proof of proposition 1:** Let

$$A = \{x : x \leq f(x)\}. \tag{6}$$

Note that  $0 \in A$  and therefore  $A \neq \emptyset$ . Let  $x^* = \sup A$ . Then  $f(x^*) \geq x^*$  by the definition of  $A$ , see equation (6), and because  $f$  is increasing. If  $x^* = 1$ , then  $f(1) = 1$  and we are done. Hence, assume  $x^* < 1$  for the remainder.

Also  $f(x^*) \leq x^*$ : if not, i.e.  $f(x^*) > x^*$ , then  $x^* + \varepsilon < f(x^* + \varepsilon)$  for some  $\varepsilon \in (x^*, f(x^*)] \cap [0, 1]$  because  $f$  is increasing which contradicts the definition of  $x^*$ . Hence,  $x^* = f(x^*)$ .  $\square$

## References

- Posner, R. A. (1981). The economics of privacy. *American Economic Review* 71(2), 405–409.
- Solove, D. J. (2010). *Understanding Privacy*. Cambridge, MA: Harvard University Press.
- Stigler, G. J. (1980). An introduction to privacy in economics and politics. *Journal of Legal Studies* 9(4), 623–644.