Style Guide

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Abstract

This document contains some general guidelines for technical writing. I started this guide a few years ago to avoid repeating the same corrections for each student. It is a work in progress and steadily updated.

good	bad
Latex code	

1 Basics

AE vs BE

color, emphasize, parameterize, ...	colour, emphasise, parameterise, ...

Modern plurals

formulas, lemmas	formulae, lemmata

Frequent misspellings

we prove	we proof
we denote its set of vertices by V	we denote it's set of vertices by V

Use active voice

we show that	it is shown that
the formula is satisfied by the assignment	the assignment satisfies the formula

Commas

red, green, and blue	red, green and blue

Add a comma after "i.e." and "e.g."

an acyclic graph, i.e., a graph without cycles	an acyclic graph i.e. a graph without cycles
a combinatorial object, e.g., a graph	a combinatorial object, e.g. a graph

Hyphens and Dashes

There are four types: the hyphen - (Latex `-`), the en-dash – (Latex `--`), the em-dash — (Latex `---`), and the minus sign − (Latex `$-$`) with the following usage:

this is well-written	`-`
first we show properties (5)–(7)	`--`
first think—then write	`---`
$1 - 1 = 0$	`$-$`

Observe that there is no space before and after the em-dash.

Plural ≠ set

let V be the vertices of G	let V be the set of vertices of G

Placement of set symbol

Consider a set V of vertices	Consider a set of vertices V

Full sentences

This implies the following result: Theorem 5. ...	This implies Theorem 5 ...

Displayed formulas are part of a sentence

The tensor needs to satisfy $$A = f(g), \quad B = f(h), \quad C = f(e)$$	The tensor needs to satisfy $$A = f(g), \quad B = f(h), \text{ and } \quad C = f(e).$$

Don't formalize the meta-language

All even numbers are divisible by 2.	$\forall$ even number is divisible by 2.

Use "if" in definitions

A graph is *simple* if it has no self-loops or parallel edges.	A graph is *simple* if and only if it has no self-loops or parallel edges.

Emphasize the defined term

A graph is *simple* if it has no self-loops or parallel edges.	A graph is simple if it has no self-loops or parallel edges.

Avoid iff

x is even if and only if it is divisible by 2.	x is even iff it is divisible by 2.

Always specify ranges

$\sum_{i \in I} X_i \bigcup_{i=1}^{n} S_i$	$\sum_i X_i \bigcup_i S_i$

Use $\cdot$ for multiplication of numbers

$\times$ is for the Cartesian product.

$2 \cdot \lvert E \rvert = \sum_{v \in V} d(v)$	$2 * \lvert E \rvert$ or $2 \times \lvert E \rvert$

Elements

b is an element of $\{a, b, c\}$	b is a member of $\{a, b, c\}$

Natural numbers

The term *natural number* is confusing as sometimes 0 is considered to be included and sometimes not. Rather use *positive integer* or *nonnegative integer*. For the same reason avoid $\mathbb{N}$.

Avoid nested proofs

Proof. The formula is satisfiable. *Proof.* ... □ Hence the theorem follows. □	*Proof.* We claim that the formula is satisfiable. To show this claim, we ... As we have established the claim, the theorem follows. □

Capitaliziation

we will prove Theorem 5 in Section 3	we will prove theorem 5 in section 3
we will prove this theorem in the next section	we will prove this Theorem in the next Section

Citations

A sentence should remain grammatically correct when omitting citations, since the citation is parenthetical.

Bodlaender [5] has shown	in [5] it was shown
For standard graph theoretic terminology we refer to other sources [2]	For standard graph theoretic terminology we refer to Diestel [2]

Author $\neq$ paper

We refer to the work of Bodlaender [5]	we refer to Bodlaender [5]

Name-year references

Bodlaender (1995) showed that ...	Bodlander (Bodlander 1995) showed that ...

Avoid ambiguity

The above procedure was later improved	This was later improved

Parallelism

In a bullet list or other list, all items should be of the same type (single worlds, phrases, or full sentences). They should also have the same type.

In this paper we make the following contributions: • we introduce the notion of XY-formulas; • we prove the correctness of our characterization; and • we provide experimental evidence.	In this paper we make the following contributions: • we introduce the notion of XY-formulas; • a new characterization is given; and • experimental evidence complements the theoretical results.

Text size in figures

Labels in figures (such as the labels of nodes of a graph) should have the same text size as the other text in the document.

To allow is a transitive verb

This data structure allows us to encode the problem efficiently	This data structure allows an efficient encoding of the problem

Definite and indefinite articles

When something isn't unique (like the solution to an optimization problem) us an indefinite article.

P is a shortest path between x and y	P is the shortest path between x and y

Avoid imperatives

There are some cases where it can't be avoided like in "let n be a number" but in most other formulations try to avoid commanding the reader to do something.

we note/observe that x is even	observe/note that x is even

Exercise for the reader

In textbooks one can often read phrases like "the proof is straightforward and left as an exercise to the reader." Such a phrase has no place in a research paper or thesis.

Punctuation at the end of a quotation

some authors refer to this method as a "lazy encoding."	some authors refer to this method as a "lazy encoding".

Present vs past tense

Try to be consistent, don't mix tenses. Although it is natural to describe an experiment in past tense ("first we did this, then we observed that") it is sometimes good and more engaging for the reader to write this in present tense ("first we do this, then we observe that"). In the conclusion one can switch to past tense.

2 LaTeX

Avoid bad line breaks with a tilde

```
Theorem~4, Section~8, graph~$G$, Bodlander~[5]
```

Bonus tip: clever refs

Use the *cleveref.sty* package to automatize references.

Theorem 4 in Section 2	`\Cref{the:main} in \Cref{sec:prelims}`

Line breaks in hyphenated terms

Latex won't put a line-break into a hyphenated word such as k-colorability. Use the macro `\hy` instead.

k-colorability	`$k$-colorability`
k-colorability	`$k$\hy colorability`

```
\newcommand{\hy}{\hbox{-}\nobreak\hskip0pt}
```

Classes vs Sets

Observe the added space at the beginning and end of a class, use a macro.

class $\{\, a : a \leq b \,\}$	`$\SB a \SM a \leq b \SE $`
set $\{a, b, c, d\}$	`$\{a,b,c,d\}$`

```
\newcommand{\SB}{\{\,}
\newcommand{\SM}{\;{:}\;}
\newcommand{\SE}{\,\}}
```

Displayed formulas

$$e = mc^2$$	`\[e=mc^2\]`, not `$$e=mc^2$$`

Don't use math mode for words

function(x)	`$\mathrm{function}(x)$` not `$function(x)$`

amsmath.sty offers more variants, like `\text{}` and `\textsf{}`.

Symbol for functions

$f : A \to \{0, 1\}$	`\rightarrow` not `\mapsto`

Tables

Use the *booktabs.sty* package for nicely formatted tables, don't forget to add `@{}` left and right of the table format string.

Item		
Animal	Description	Price ($)
Gnat	per gram	13.65
	each	0.01
Gnu	stuffed	92.50
Emu	stuffed	33.33
Armadillo	frozen	8.99

```
\begin{tabular}{@{}llr@{}} \toprule
\multicolumn{2}{c}{Item} \\ \cmidrule
(r){1-2}
Animal & Description & Price (\$)\\
\midrule
 Gnat & per gram & 13.65 \\
 & each & 0.01 \\
Gnu & stuffed & 92.50 \\
Emu & stuffed & 33.33 \\
 Armadillo & frozen & 8.99 \\
\bottomrule
\end{tabular}
```

Use `\xspace` for shorthands

When using a macro in text mode, one easily forgets to close it with `{}`, and then the space after it gets eliminated. Hence always use `\xspace` from the *xspace.sty* package.

```
\newcommand{\dt}{decision tree\xspace}
```

3 BibTeX

Use macros for journal names

```
@string{DAM={Discr.  Appl.  Math.}}
```

Capitalize personal names and acronyms in titles

A new QBF solver based on Cook's Theorem

```
title={A new {QBF} solver based on
{Cook's} {Theorem} }
```

Use a consistent entry keys like author-year

```
@article {BodlaenderKloksKratsch95},
author = {H. L. Bodlaender and T. Kloks and D. Kratsch},
```

Don't mutilate the bibtex file

If you need to save space, don't change the .bib file. At the very end before submission, edit the .bbl file and copy its contents into the main file.

4 Further Reading

A Primer of Mathematical Writing by Krantz [4] is an excellent introduction to the subject, where general considerations and Latex-specific issues are discussed. An excellent source is the book *Mathematical Writing* by Knuth et al. [3], which provides a good (and humorous) introduction and further references. I consider Knuth an authority in typesetting and mathematical writing; hence I highly recommend this book, but also his *Tex Book* [2], which focuses on original Tex (and not Latex), but his general comments still apply. See also the *Oxford Guide To Plain English* by Cutts [1] for general guidelines for writing plain technical English (be cautious that this uses British English (BE). In contrast, we use American English (AE) in our writings.

References

[1] M. Cutts. *Oxford Guide To Plain English, 5th edition.* Oxford University Press, 2020.

[2] D. E. Knuth. *The TeXbook.* Addison-Wesley, 1986.

[3] D. E. Knuth, T. L. Larrabee, and P. M. Roberts. *Mathematical Writing.* Mathematical Association of America, 1989. https://www.ac.tuwien.ac.at/files/pub/knuth-larrabee-roberts-1987.pdf.

[4] S. G. Krantz. *A Primer of Mathematical Writing, 2nd edition.* American Mathematical Society, 2017. https://www.ac.tuwien.ac.at/files/pub/krantz-2017.pdf.