



Technische Universität München

# Master's Thesis

INSTITUTE FOR HUMAN-MACHINE COMMUNICATION  
TECHNISCHE UNIVERSITÄT MÜNCHEN  
Univ.-Prof. Dr.-Ing. habil. G. Rigoll

## Standard Template for a Thesis in English at the Institute for Human-Machine Communication

Student's name

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# Abstract

Please note, that abstract has to be in English!

In this work we analyze ...

On the basis of our simulations we show that ...



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# Introduction

## 1.1 Notation

Please follow the typesetting standards in mathematics that the International Standards Organization (ISO) has established. The most important points in it are:

1. Simple variables are represented by italic letters as  $a$ ,  $x$ ,  $A$ ,  $X$ .
2. Vectors are written in boldface italic (uncapitalized) as  $\mathbf{a}$ ,  $\mathbf{x}$ .
3. Matrices may appear as boldface italic capital letters as in  $\mathbf{A}$ ,  $\mathbf{X}$ .
4. Sets are represented by capital script letters as  $\mathcal{A}$ ,  $\mathcal{X}$ .
5. The special numbers  $e$ ,  $i$  and the differential operator  $d$  are written in upright roman.

## 1.2 Compilation with latex

Generally, a  $\text{\LaTeX}$  document is compiled with the command `latex thesis`. If you use `bibtex` for your references the typical compilation workflow is:

- `latex thesis`
- `bibtex thesis`
- `latex thesis`
- `latex thesis`
- `dvipdf thesis`

All graphics must be in the eps format (the eps format is further commented in Section 1.4).

## 1.3 Compilation with pdflatex

The use of `pdflatex` instead of `latex` has the following benefits: Pictures can be included as pdf, jpg, and png files and the output is directly in pdf (no dvips). The compilation is also faster.

If you use bibtex the compilation steps should be:

- `pdflatex thesis`
- `bibtex thesis`
- `pdflatex thesis`
- `pdflatex thesis`

## 1.4 Figures

Figures are handled in the standard L<sup>A</sup>T<sub>E</sub>X manner. For example:

```
\begin{figure}
  \centering
  \includegraphics[width=0.8\linewidth]{myfigure}
  \caption{Simulation Results}
  \label{fig:label}
\end{figure}
```

If you want subfigures, include the subfigure package `\include{subfigure}`.

Make sure that you save your graphics in vector form, which will not degrade or pixelize your graphic when magnified. If you compile with `latex` this would be `myfigure.eps` and for `pdflatex` users `myfigure.pdf`. Both eps and pdf support vector graphics.

How to generate graphics? Draw all your drawings with a drawing/graphic application that supports vector graphics. My favourite is OpenOffice Draw. Alternatives include Adobe Illustrator, sK1, Inkscape, Xara Xtreme. These application save your drawing automatically in vector form; if you include a photo it is usually still saved in bitmap form. Matlab plots can be directly saved as eps/pdf. Note that Matlab saves pdfs in DIN A4 size. You can crop the pdf with the shell command `pdfcrop myfigure.pdf`.

The `psfrag` package might be of interest for `latex` users. `Psfrag` allows the user to "go into" an eps graphic and replace text strings contained in it with real L<sup>A</sup>T<sub>E</sub>X code (works not with `pdflatex`).

## 1.5 Clean Bibliography

Go to <http://dblp.mpi-inf.mpg.de/dblp-mirror/index.php> and search for the paper you want to cite. You can copy the bibtex entry from there directly to your bibliography file, so that all the references have the same look.

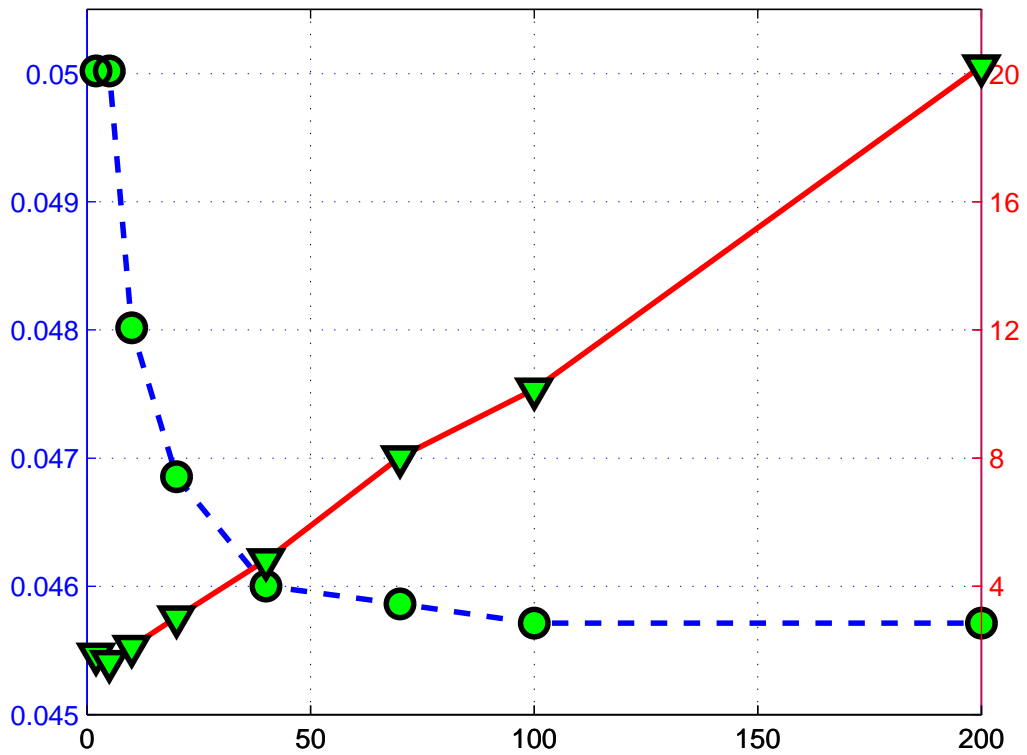




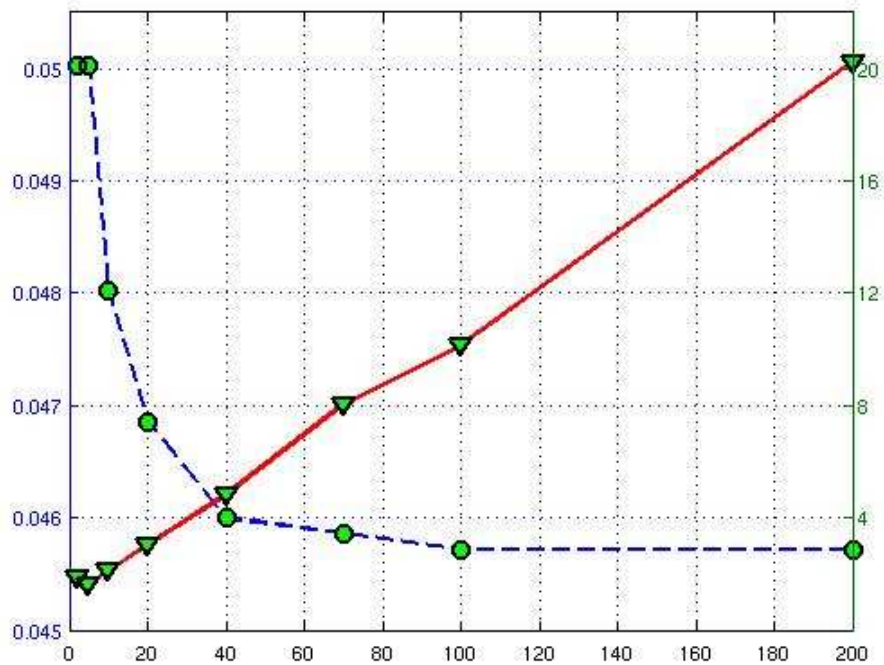
Figure 1.1: Some sample figure.

### 1.6 $\text{\LaTeX}$ Literature

My favourite  $\text{\LaTeX}$  tutorial is the  $\text{\LaTeX}$  primer written by Krishnan [Kri03] and a quite comprehensive book is [Kop03], of which the library has adequate stock.



(a) Matlab plot exported directly as eps/pdf which saves the plot in vector form. Note the nice quality even though it has been rescaled.



(b) Matlab plot saved in bitmap form. The quality is bad. Remember: Export your figures as vector graphic if possible.





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**Own Work**









## Conclusion and Outlook

### 5.1 Conclusion

### 5.2 Outlook



# A

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## Upper Bounds on the Expected Error Probability

### A.1 Recognition Accuracy Rate



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# Bibliography

- [Kop03] H. Kopka. *Guide to L<sup>A</sup>T<sub>E</sub>X*. Addison-Wesley, 4 edition, December 2003.
- [Kri03] E. Krishnan. L<sup>A</sup>T<sub>E</sub>X tutorials: A primer. <http://www.eng.cam.ac.uk/help/tpl/textprocessing/ltxprimer-1.0.pdf>, 2003. Indian TeX Users Group.