Study Notes

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LIST OF DEFINITIONS

List of Abbreviations and Symbols

$\mathbb{R}$ Real number 12
$\vec{v}$ a vector 12

List of Abbreviations and Symbols

Acronyms

MLE Maximum Likelihood Estimation 17

SVM Support Vector Machine 12

Preface

0.1 Features of this template

> *TeX, stylized within the system as LaTeX, is a typesetting system which was designed and written by Donald Knuth and first released in 1978. TeX is a popular means of typesetting complex mathematical formulae; it has been noted as one of the most sophisticated digital typographical systems.*
>
> - Wikipedia

0.1.1 crossref

different styles of clickable definitions and theorems

- nameref: Gaussian distribution
- autoref: Definition A.1, ??
- cref: Definition A.1,
- hyperref: Gaussian,

0.1.2 ToC (Table of Content)

- mini toc of sections at the beginning of each chapter
- list of theorems, definitions, figures
- the chapter titles are bi-directional linked

0.1.3 header and footer

fancyhdr

- right header: section name and link to the beginning of the section
- left header: chapter title and link to the beginning of the chapter
- footer: page number linked to ToC of the whole document

0.1.4 bib

- titles of reference is linked to the publisher webpage e.g., [Kit+02]
- backref (go to the page where the reference is cited) e.g., [Chi09]
- customized video entry in reference like in [Bab16]

0.1.5 preface, index, quote (epigraph) and appendix

index page at the end of this document...

0.1.6 symbol and glossary (abbreviation)

examples: $\mathbb{R}$, Support Vector Machine (SVM), $\vec{v}$

usage

- glossary package

```
pdflatex scinote.tex
makeglossaries scinote
pdflatex scinote.tex
```

- glossary-extra package and bib2gls

```
pdflatex scinote.tex
bib2gls scinote
pdflatex scinote.tex
```

0.2 Related Tools

0.2.1 VSCode

Extension: Latex Workshop by James Yu

settings

0.2.2 lualatex and latexmk

.latexmkrc configuration file

```
$pdflatex␣=␣'lualatex␣-synctex=1␣-interaction=nonstopmode␣--shell-escape␣%O␣%S';
@generated_exts␣=␣(@generated_exts,␣'synctex.gz');
$pdf_mode␣=␣1;

add_cus_dep('glo',␣'gls',␣0,␣'makeglo2gls');
sub␣makeglo2gls␣{
system("makeindex␣-s␣'$_[0]'.ist␣-t␣'$_[0]'.glg␣-o␣'$_[0]'.gls␣'$_[0]'.glo");
}
```

To explain ....

```
# Also delete the *.glstex files from package glossaries-extra. Problem is,
# that that package generates files of the form "basename-digit.glstex" if
# multiple glossaries are present. Latexmk looks for "basename.glstex" and so
# does not find those. For that purpose, use wildcard.
$clean_ext = "%R-*.glstex";

push @generated_exts, 'glstex', 'glg';

add_cus_dep('aux', 'glstex', 0, 'run_bib2gls');

# PERL subroutine. $_[0] is the argument (filename in this case).
# File from author from here: https://tex.stackexchange.com/a/401979/120853
sub run_bib2gls {
    if ( $silent ) {
    #    my $ret = system "bib2gls --silent --group '$_[0]'"; # Original version
        my $ret = system "bib2gls --silent --group $_[0]"; # Runs in PowerShell
    } else {
    #    my $ret = system "bib2gls --group '$_[0]'"; # Original version
        my $ret = system "bib2gls --group $_[0]"; # Runs in PowerShell
    };

    my ($base, $path) = fileparse( $_[0] );
    if ($path && -e "$base.glstex") {
        rename "$base.glstex", "$path$base.glstex";
    }

    # Analyze log file.
    local *LOG;
    $LOG = "$_[0].glg";
    if (!$ret && -e $LOG) {
        open LOG, "<$LOG";
    while (<LOG>) {
            if (/^Reading (.*\.bib)\s$/) {
        rdb_ensure_file( $rule, $1 );
        }
    }
    close LOG;
    }
    return $ret;
}
```

0.2.3 Zotero and Better-bibtex

[todo] https://retorque.re/zotero-better-bibtex/ customized entry, e.g., **Online Video**

0.3 Copyright and License

- GitHub Repo: https://github.com/cauliyang/Latex-Template-for-Scientific-Style-Book

- Overleaf template: https://www.overleaf.com/latex/templates/latex-template-for-scientific-style
ntprxjksmqxx

Part I

Machine Learning

Chapter 1

Probability

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1.1 Maximum Likelihood Estimation

Maximum Likelihood Estimation (MLE) is.

1.2 Maximum A Posteriori Estimation

1.3 Gussian Distribution

Part II

Algorithm and Data Structure

Chapter 2

Algorithm

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Appendix A

Formulas

A.1 Gaussian distribution

Definition A.1 (Gaussian distribution)**.** *Gaussian distribution*

Theorem A.1 (Central limit theorem)**.**

Bibliography

[Bab16] László Babai. "Graph Isomorphism in Quasipolynomial Time". Jan. 19, 2016. arXiv: 1512.03547 [cs, math] (cit. on p. 12). ONLINE VIDEO

[Chi09] Andrew M. Childs. *Universal Computation by Quantum Walk*. Physical Review Letters 102.18 (May 4, 2009), p. 180501. arXiv: 0806.1972 (cit. on p. 12).

[Kit+02] Alexei Yu Kitaev et al. *Classical and quantum computation*. 47. American Mathematical Soc., 2002 (cit. on p. 12).

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