

L^AT_EX 2_ε Document Styles for the University of Southampton File version v2.0, dated 2018/12/20

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1 Quickstart

This guide assumes you have installed MiKTeX or TeX live distributions. It also requires having the program “make” for producing the templates again.

The folder labelled tex-mf should be installed in your local tex files source or whatever your tex distro uses.

The Templates have been built for the Department of Electronics and Computer Science in the Faculty of Engineering and Physical Science at the University of Southampton.

The basic settings for University, Faculty and School are explained in Section 6

If a user only wishes to change the file for their thesis it is probably easier to navigate to the class file labeled uosthesis and change the department and faculty naming there. This will be located in the subdirectory where you unzipped the files under tex/latex/uosdocs/

2 Description

These L^AT_EX 2_ε document classes are designed to produce thesis, mini-thesis, progress, project, report, GDP report and GDP summary report documents which conformed to the University of Southampton guidelines of April 2001. They were updated in Jan 2019 to conform to changes in those guidelines. Specifically copy-right and authorship declaration changes. They are based on the document class **book**, but modify some of its layout decisions. An article class is also provided which is based on the document class **article**.

3 The DOCSTRIP modules

The following modules are used in the implementation to direct DOCSTRIP when generating the external files:

thesis	produce the <code>uosthesis</code> document class
minithesis	produce the <code>uosminithesis</code> document class
progress	produce the <code>uosprogress</code> document class
project	produce the <code>uosproject</code> document class
report	produce the <code>uosreport</code> document class
article	produce the <code>uosarticle</code> document class
gdp	produce the <code>uosgdp</code> document class
gdpsummary	produce the <code>uosgdpsummary</code> document class
testthesis	produce an example thesis
testminithesis	produce an example minithesis
testprogress	produce an example progress
testproject	produce an example project
testreport	produce an example report
testarticle	produce an example article
testgdp	produce an example GDP report
testgdpsummary	produce an example GDP summary report
introduction	produce an example introduction chapter
conclusions	produce an example conclusions chapter
appendix	produce an example appendix chapter
figure	produce an example figure file
definitions	produce an example definitions file
references	produce an example references file
bst	produce a bibliography style file
driver	produce a documentation driver file

4 Implementation

The checksum is to determine if there has been a truncation in the file during transmission over a network

The class has a custom option to define what colours should be used for links. This option defines `sotoncolour` to use UoS palette colours. Colour Code taken from <http://edshare.soton.ac.uk/10481>

All options are passed on to the `book` or `article` class.

```
1 <{*thesis | minithesis | progress | project | report | article | gdp | gdpsummary}
```

```
\baseclass
```

```
2 %% ----- Class/Formating Adjustment -----
3 %% Adjust the book class to match the requirements
4 %% Set spacing, line and paragraph options
5 %% Set LaTeX builder options (work break penalties etc.)
6 <{*thesis | minithesis | progress | project | report | gdp | gdpsummary}
7 \def\baseclass{book}
8 </thesis | minithesis | progress | project | report | gdp | gdpsummary}
9 <{*article}
10 \def\baseclass{article}
11 </article}

12 \RequirePackage{xcolor}
13 \colorlet{linkBlue}{blue}
14 \colorlet{custGray}{gray}
15 \colorlet{chapRed}{red}
```

```

16 \DeclareOption{sotoncolour}{
17 \definecolor{sotonMarineBlue}{RGB}{1,67,89} % Soton marine blue (P 7469C)
18 \definecolor{sotonGrey}{RGB}{153,153,166} % Soton grey (P 443C)
19 \definecolor{sotonRed}{RGB}{171,18,16} % Soton Red (P 484C)
20 \colorlet{linkBlue}{sotonMarineBlue}
21 \colorlet{custGray}{sotonGrey}
22 \colorlet{chapRed}{sotonRed}
23 }
24 \DeclareOption*{\PassOptionsToClass{\CurrentOption}{\baseclass}}

```

`\@checkoptions` Before we can process the options we must deal with a small problem. That is, we want to change the default options of the `book` or `article` class to `a4paper` and `11pt` or `12pt` but the macro `\ProcessOptions` used by the `book` or `article` class processes the options in the order specified in the file. Because `a4paper` is the first of the paper sizing options it will be overridden by any user defined option. But the same is not true of the font size option `11pt` or `12pt`. To remedy this we define a macro `\@checkoptions{<default>}{<option-list>}` which checks to see if any options in `<option-list>` have been specified and if not adds `<default>` to the option list.

```

25 \def\@checkoptions#1#2{
26   \edef\@curroptions{\@optionlist{\@currname.\@current}}
27   \@tempswafalse
28   \@tfor\@this:=#2\do{
29     \@expandtwoargs\in@{,\@this,}{,\@curroptions,}
30     \ifin@ \@tempswatrue \@break@tfor \fi
31     \let\@this\@empty
32     \if@tempswa \else \PassOptionsToClass{#1}{\baseclass}\fi
33 }

```

With this macro at our disposal we can continue to process the options

```

34 <thesis | minithesis | progress | report | article | gdp | gdpsummary>
35 \@checkoptions{11pt}{10pt}{11pt}{12pt}
36 </thesis | minithesis | progress | report | article | gdp | gdpsummary>
37 <*project>
38 \@checkoptions{12pt}{10pt}{11pt}{12pt}
39 </project>
40 \PassOptionsToClass{a4paper}{\baseclass}
41 \ProcessOptions\relax

```

and load the `book` or `article` document class with `A4` as the default paper size.

```

42 \LoadClass{\baseclass}

```

4.1 Banner

`\bhrule` Provide a function to produce a banner on the output making the location of the current section simpler.

```

43 \newcommand\bhrule{\typeout{-----}}
44 \newcommand\btypeout[1]{\bhrule\typeout{\space #1}\bhrule}

```

4.2 Date

`\today` This macro uses the \TeX primitives `\month`, `\day` and `\year` to provide the date of the \LaTeX -run in a suitable format.

```
45 <*thesis>
46 \def\today{\ifcase\month\or
47   January\or February\or March\or April\or May\or June\or
48   July\or August\or September\or October\or November\or December\fi
49   \space \number\year}
50 </thesis>
```

5 Document Layout

5.1 Font

```
51 %% \usepackage[T1]{fontspec}
52 %   Set font for copyright statement body text
53 \usepackage[defaultsans]{droidsans}
54 %   Set a particular style of font for the thesis. A font that has smallcaps
55 \usepackage{mathpazo}
56 %%\usepackage[T1]{fontenc} %This may not be necessary for english only text
```

5.2 Spacing

Load the `setspace` package so that spacing can easily be set. The text in all three styles is set to one and a half spacing, paragraphs not indented, and a newline between paragraphs.

```
57 \usepackage{setspace}
58 <thesis | minithesis | progress | project | report | gdp | gdpsummary>\onehalfspacing
59 <article>\singlespacing
60 \setlength{\parindent}{0pt}
61 \setlength{\parskip}{2.0ex plus0.5ex minus0.2ex}
```

5.3 Margins

Load the `vmargin` package to setup the page dimensions.

```
62 \usepackage{vmargin}
63 <*thesis | minithesis | progress | project | report | gdp | gdpsummary>
64 \setmarginsrb          { 1.5in} % left margin
65                       { 0.6in} % top margin
66                       { 1.0in} % right margin
67                       { 0.8in} % bottom margin
68                       { 20pt}  % head height
69                       {0.25in} % head sep
70                       { 9pt}   % foot height
71                       { 0.3in} % foot sep
72 </thesis | minithesis | progress | project | report | gdp | gdpsummary>
73 <*article>
74 \setmarginsrb          { 0.8in} % left margin
75                       { 0.6in} % top margin
76                       { 0.8in} % right margin
77                       { 0.8in} % bottom margin
78                       { 20pt}  % head height
```

```

79 {0.25in} % head sep
80 { 9pt} % foot height
81 { 0.3in} % foot sep
82 </article>

```

5.4 Breaks

Control how pages and lines are broken.

```

83 \raggedbottom
84 \setlength{\topskip}{1\topskip \@plus 5\p@}
85 \doublehyphendemerits=10000 % No consecutive line hyphens.
86 \brokenpenalty=10000 % No broken words across columns/pages.
87 \widowpenalty=9999 % Almost no widows at bottom of page.
88 \clubpenalty=9999 % Almost no orphans at top of page.
89 \interfootnotelinepenalty=9999 % Almost never break footnotes.

```

5.5 Fancy Page Headers

Setup the the default fancy page headers with an underlined header containing chapter, name and page number.

```

90 \usepackage{fancyhdr}
91 % Help from https://texblog.org/2007/11/07/headerfooter-in-latex-with-fancyhdr/#comment-4783
92 \fancyhead[LE]{\textrm\thepage}
93 \fancyhead[LO]{\fancyplain{}{\textsl{\rightmark}}}}
94 \fancyhead[RE]{\fancyplain{}{\textsl{\leftmark}}}}
95 \fancyhead[RO]{\textrm\thepage}
96 \head{}\lfoot{}\rfoot{}\cfoot{}
97 \pagestyle{fancy}
98 \fancypagestyle{plain}{
99   \fancyhf{}
100   \fancyhead[OR]{\thepage}
101   \renewcommand{\headrulewidth}{0pt}
102 }

```

`\chaptermark` Redefine `chaptermark` and `sectionmark` to set up the correct header name and
`\sectionmark` produce a banner on the output making the location of messages simpler.
`\subsectionmark` The `\btypeout` command is for console logging where chapters start
`\chapapp` expands to "Chapter" or "Appendix"

```

103 <thesis | minithesis | progress | project | report | gdp>
104 \renewcommand{\chaptermark}[1]{\btypeout{\thechapter.\space #1}\markboth{\chaptername\ \thechapter}{\thechapter}}
105 \renewcommand{\sectionmark}[1]{\markright{\thesection.\hspace{1em}#1}}
106 \renewcommand{\subsectionmark}[1]{}
107 </thesis | minithesis | progress | project | report | gdp>
108 <*article>
109 \renewcommand{\sectionmark}[1]{\btypeout{\thesection\hspace{1em}}\markboth{}{\thesection.\hspace{1em}#1}}
110 \renewcommand{\subsectionmark}[1]{}
111 \renewcommand{\subsubsectionmark}[1]{}
112 </article>
113 \gdpsummary\markboth{GDP Summary Report}{GDP Summary Report}

```

`\cleardoublepage` Redefine `cleardoublepage` to remove headers from blank pages in twosided documents.

```

114 \def\cleardoublepage{\clearpage\if@twoside \ifodd\c@page\else
115 \hbox{}
116 \thispagestyle{empty}
117 \newpage
118 \if@twocolumn\hbox{}\newpage\fi\fi\fi}

```

`\cleartoeven` Define `cleartoeven` to remove headers from blank pages and force to even page for appendix or index.

```

119 \def\cleartoeven{\clearpage\if@twoside \ifodd\c@page
120 \hbox{}
121 \thispagestyle{empty}
122 \newpage
123 \if@twocolumn\hbox{}\newpage\fi\fi\fi}

```

5.6 Mathematics

Load the `amsmath` packages, so we can do some serious math, and setup the theorem environments.

```

124 %% ----- Figure/Table/Equation/Listing Styling -----
125 %% Set the styling for non text elements of the document
126 \usepackage{amsmath,amsfonts,amssymb,amscd,amsthm,xspace}
127 \theoremstyle{plain}
128 \newtheorem{example}{Example}[chapter]
129 \newtheorem{theorem}{Theorem}[chapter]
130 \newtheorem{lemma}{Lemma}[chapter]
131 \newtheorem{proposition}{Proposition}[chapter]
132 \newtheorem{axiom}{Axiom}[chapter]
133 \newtheorem{definition}{Definition}[chapter]
134 \newtheorem{remark}{Remark}[chapter]
135 \newtheorem{corollary}{Corollary}[chapter]
136 \newtheorem{lemma}{Lemma}[chapter]
137 \newtheorem{proposition}{Proposition}[chapter]
138 \newtheorem{axiom}{Axiom}[chapter]
139 \newtheorem{definition}{Definition}[chapter]
140 \newtheorem{remark}{Remark}[chapter]
141 \newtheorem{corollary}{Corollary}[chapter]
142 \newtheorem{lemma}{Lemma}[chapter]
143 \newtheorem{proposition}{Proposition}[chapter]

```

5.7 Captions

`\fref` Load the `caption` package to improve formatting of captions, and provide short
`\tref` referencing commands.

```

\eref 144 \usepackage[justification=centerlast,font=small,labelfont=sc]{caption}
\cref 145 \setlength{\captionmargin}{20pt}
\sref 146 \newcommand{\fref}[1]{Figure~\ref{#1}}
\aref 147 \newcommand{\tref}[1]{Table~\ref{#1}}
148 \newcommand{\eref}[1]{Equation~\ref{#1}}
149 \newcommand{\cref}[1]{Chapter~\ref{#1}}
150 \newcommand{\sref}[1]{Section~\ref{#1}}
151 \newcommand{\aref}[1]{Appendix~\ref{#1}}

```

5.8 Float Placement

`\topfraction` Preventing figures from appearing on a page by themselves. L^AT_EX's figure placement algorithm is quite biased in favour of putting figures on a page by themselves, instead of on the top of a page with some text below it. Fortunately, the parameters of the algorithm can be changed. The main problem is that L^AT_EX per default only allows a part of the top of a text-page (70%) to contain figures, and requires at least 20% of a page to be text when text and figures share a page. These parameters should be set to more reasonable values, for example 85% and 10%.

```
152 \renewcommand{\topfraction}{0.85}
153 \renewcommand{\bottomfraction}{.85}
154 \renewcommand{\textfraction}{0.1}
155 \renewcommand{\dbltopfraction}{.85}
```

`\floatpagefraction` This helps, but sometimes L^AT_EX puts a figure on a page by itself, although it would fit perfectly well on the top of a page. This happens when the figure will not fit on the page where it was defined. L^AT_EX then attempts to put it on a figures-only page before it attempts to put it at the top of the next page. A page may contain figures alone if the figure(s) use at least half the page. To prevent half-empty pages this limit should probably be increased to around 75%.

```
156 \renewcommand{\floatpagefraction}{0.75}
157 \renewcommand{\dblfloatpagefraction}{.75}
```

Be careful not to make `floatpagefraction` larger than `topfraction`, then you risk to produce a figure that can neither go on the top of a text page, nor on a page by itself. If that happens, the figure and all later figures will be postponed until next time a `clearpage` is executed (typically at the end of a chapter or the end of the document). This will also happen if a figure is too large to fit on a page.

```
158 \setcounter{topnumber}{9}
159 \setcounter{bottomnumber}{9}
160 \setcounter{totalnumber}{20}
161 \setcounter{dbltopnumber}{9}
```

5.9 Graphics

Load the `graphicx` package, so we can include pictures easily. Load the `epstopdf`, so that eps files are automatically converted to pdf when pdfL^AT_EX is used. This requires a version of *epstopdf* to be installed on you system. You can find a windows version at

<http://www.ctan.org/tex-archive/support/epstopdf/epstopdf.exe>.

```
162 \usepackage{graphicx}
163 \usepackage{epstopdf}
```

5.10 Subfigures and subtables

Load the `subcaption` package, so we can include subfigures easily.

```
164 \usepackage[] {subcaption}
165 \usepackage{booktabs}
166 \usepackage{rotating}
```

5.11 Listings

Load the listings package, so we can include listings easily.

```
167 \usepackage{listings}
168 % \usepackage{lstpatch}
169 \lstset{captionpos=b,
170         frame=tb,
171         basicstyle=\scriptsize\ttfamily,
172         showstringspaces=false,
173         keepspaces=true}
174 \lstdefinestyle{matlab} {
175     language=Matlab,
176     keywordstyle=\color{blue},
177     commentstyle=\color[rgb]{0.13,0.55,0.13}\em,
178     stringstyle=\color[rgb]{0.7,0,0} }
```

5.12 Hyperlinks

Load the hyperref package to provide hyperlinks in pdf and dvi documents.

```
179 \usepackage[pdftex]{hyperref},bookmarks=true,bookmarksopen=true,
180     bookmarksopenlevel=0,bookmarksnumbered=true,hypertextnames=false,
181     colorlinks,linkcolor={linkBlue},citecolor={linkBlue},urlcolor={linkBlue},
182     pdfstartview={FitV},unicode,breaklinks=true}{hyperref}
183 \pdfstringdefDisableCommands{
184     \let\\\space
185 }
```

6 Internal Names

<code>\supervisor</code>	The various elements of the documents are defined as control sequences to make
<code>\examiner</code>	it easy to customize this style for other parts of the University.
<code>\degree</code>	186 %% ----- Organisational Structure -----
<code>\authors</code>	187 \newcommand*{\supervisor}[2] [] {\def\supname{#2}\def\supplural{#1}}
<code>\addresses</code>	188 \newcommand*{\examiner}[2] [] {\def\examname{#2}\def\examplural{#1}}
<code>\university</code>	189 \newcommand*{\degree}[1] {\def\degreename{#1}}
<code>\UNIVERSITY</code>	190 \newcommand*{\authors}[1] {\def\authornames{#1}}
<code>\department</code>	191 \newcommand*{\qualifications}[1] {\def\quals{#1}}
<code>\DEPARTMENT</code>	192 \newcommand*{\addresses}[1] {\def\addressnames{#1}}
<code>\group</code>	193 \newcommand*{\doi}[1] {\def\doicode{#1}}
<code>\GROUP</code>	194 \newcommand*{\volume}[2] {\def\volno{#1}\def\volof{#2}}
<code>\faculty</code>	195 \newcommand*{\orcidid}[1] {\def\orcid{#1}}
<code>\FACULTY</code>	196 \newcommand*{\university}[1] {\def\univname{#1}}
<code>\subject</code>	197 \newcommand*{\UNIVERSITY}[1] {\def\UNIVNAME{#1}}
<code>\keywords</code>	198 \newcommand*{\department}[1] {\def\deptname{#1}}
	199 \newcommand*{\DEPARTMENT}[1] {\def\DEPTNAME{#1}}
	200 \newcommand*{\group}[1] {\def\groupname{#1}}
	201 \newcommand*{\GROUP}[1] {\def\GROUPNAME{#1}}
	202 \newcommand*{\faculty}[1] {\def\facname{#1}}
	203 \newcommand*{\FACULTY}[1] {\def\FACNAME{#1}}
	204 \newcommand*{\subject}[1] {\def\subjectname{#1}}
	205 \newcommand*{\keywords}[1] {\def\keywordnames{#1}}

`\supname` The internal names of the elements are set to defaults appropriate to the Department of Electronics and Computer Science.
`\examname`
`\degreename` By running these commands at the top of your tex file it will overwrite the defaults.
`\authornames`
`\univname` 206 %% ----- Organisational Structure -----
`\UNIVNAME` 207 \doi{}
`\deptname` 208 \supervisor {}
`\DEPTNAME` 209 \examiner {}
`\groupname` 210 \degree {}
`\GROUPNAME` 211 \authors {}
`\facname` 212 \qualifications{}
`\FACNAME` 213 \orcidid{}
`\subjectname` 214 \volume{}{}
`\keywordnames` 215 \university {\texorpdfstring{\href{http://www.southampton.ac.uk}}
216 {University of Southampton}}
217 {University of Southampton}}
218 \UNIVERSITY {\MakeUppercase{\univname}}
219 \department {School of Electronics and Computer Science}
220 \DEPARTMENT {\MakeUppercase{\deptname}}
221 \group {Cyber Physical Systems Group}
222 \GROUP {\MakeUppercase{\groupname}}
223 \faculty {Faculty of Engineering and Physical Science}
224 \FACULTY {\MakeUppercase{\facname}}
225 \addresses {}
226 \subject {}
227 \keywords {}

7 Special Pages

7.1 Title Page

`\maketitle` Setup an appropriate title page and pdf strings if we are using pdfL^AT_EX.
The
global
let
@title
@empty has been removed
Possibly the relax statement also needs to be removed
228 <{*thesis | minithesis | progress | project | report | gdp | gdpsummary}>
229 % Start by Adding meta data to the produced document
230 \usepackage{titling}
231 \AtBeginDocument{
232 \hypersetup{pdftitle={\thetitle}}
233 \hypersetup{pdfsubject={\subjectname}}
234 \hypersetup{pdfauthor={\authornames}}
235 \hypersetup{pdfkeywords={\keywordnames}}
236 }
237 % Define the title page layout
238 \renewcommand{\maketitle}{
239 \btypeout{Title Page}
240 \thispagestyle{empty}
241 \begin{titlepage}

```

242 \let\footnotesize\small
243 \let\footnoterule\relax
244 \let \footnote \thanks
245 \setcounter{footnote}{0}
246 \null\vfil
247 \vskip 60\p@
248 \begin{center}
249 \setlength{\parskip}{0pt}
250 {\scshape\LARGE\textbf{\univname}\par}
251 %% TODO: Change all the descriptions to italic like the Thesis one
252 (*thesis | minithesis | progress | project | gdp | gdpsummary)
253 \bigskip
254 {\large \facname \par}
255 (/thesis | minithesis | progress | project | gdp | gdpsummary)
256 (*thesis | minithesis | progress | project)
257 {\large \deptname \par}
258 (/thesis | minithesis | progress | project)
259 \vfill
260 (*minithesis)
261 {\large A mini-thesis submitted for transfer from}
262 {\large MPhil to PhD \par}
263 (/minithesis)
264 (*progress)
265 {\large A progress report submitted for continuation}
266 {\large towards a PhD \par}
267 (/progress)
268 (*project)
269 {\large A project report submitted for the}
270 {\large award of \par \degreename \par}
271 (/project)
272 (*gdp)
273 {\large A group design project report submitted for}
274 {\large the award of \par \degreename \par}
275 (/gdp)
276 (*gdpsummary)
277 {\large A group design project summary report submitted}
278 {\large for the award of \par \degreename \par}
279 (/gdpsummary)
280 (*minithesis | progress | project | gdp | gdpsummary)
281 \vfill
282 {\normalsize Supervisor\supplural: \supname \par}
283 {\normalsize Examiner\examplural: \examname \par}
284 \vfill
285 \hspace{6mm}\parbox[t][51mm][s]{89mm}{
286 \center
287 \vfill
288 {\large \bf \@title \par}
289 \vfill
290 {\normalsize \textit{by} \textbf{\authornames \par}
291 \vfill
292 {\normalsize \@date \par}
293 \vfill
294 }
295 \parbox[t][95mm][s]{89mm}{}}

```

```

296 </minithesis | progress | project | gdp | gdpsummary>
297 < *thesis | report>
298     {\huge \bf \@title \par
299 }
300     \ifthenelse{\equal{\doicode}{}}{
301     {}
302     {\smallskip DOI: \href{http://orcid.org/\doicode}{\doicode}\par}
303     \ifthenelse{\equal{\volno}{}}{
304     {}
305     {\smallskip Volume \volno{} of \volof}
306     \vfill
307     {\LARGE \textit{by} \par}
308     \smallskip
309     {\LARGE \textbf{authornames}
310     \ifthenelse{\equal{\quals}{}}{
311     {}
312     {\par\LARGE
313     \quals}
314     \par}
315     \ifthenelse{\equal{\orcid}{}}{
316     {}
317     {\smallskip
318     ORCID: \href{http://orcid.org/\orcid}{\orcid}}
319
320     \vfill
321 < *thesis>
322     {\large \textit{A thesis for the degree of} \par}
323     {\large \textit{Doctor of Philosophy} \par}
324 </thesis>
325 < *report>     {\large \textit{Technical Report} \par}
326     \bigskip
327 \bigskip
328     {\large \facname \par}
329     {\large \deptname \par}
330 </report>
331     \bigskip
332     \bigskip
333     \bigskip
334     {\Large \@date \par}
335     \bigskip
336 </thesis | report>
337     \end{center}
338     \par
339     \@thanks
340     \vfil\null
341 \end{titlepage}
342 \setcounter{footnote}{0}%
343 \global\let\thanks\relax
344 \global\let\maketitle\relax
345 \global\let\@thanks\@empty
346 \global\let\@author\@empty
347 \global\let\@date\@empty
348 \global\let\title\relax
349 \global\let\author\relax

```

```

350 \global\let\date\relax
351 \global\let\and\relax
352 \cleardoublepage
353 }
354 </thesis | minithesis | progress | project | report | gdp | gdpsummary>
355 <*article>
356 \if@titlepage
357 \renewcommand\maketitle{
358 \btypeout{Title Page}
359 \markboth{\authornames}{\@title}
360 \begin{titlepage}
361 \thispagestyle{empty}
362 \let\footnotesize\small
363 \let\footnoterule\relax
364 \let \footnote \thanks
365 \null\vfil
366 \vskip 60\p@
367 \begin{center}
368 {\LARGE \@title \par}
369 \vskip 3em
370 {\large \lineskip .75em
371 \begin{tabular}[t]{c} \authornames \end{tabular}
372 \par}
373 \vskip 1em
374 {\large \lineskip .5em
375 \begin{tabular}[t]{c} \addressnames \end{tabular}
376 \par}
377 \vskip 1.5em
378 {\large \@date \par}
379 \if\keywordnames
380 \else
381 \quotation
382 \vskip 1.5em
383 {\noindent \normalsize
384 \textbf{Keywords:}
385 \textit{\keywordnames}
386 \par}
387 \endquotation
388 \fi
389 \end{center}
390 \par
391 \@thanks
392 \vfil\null
393 \end{titlepage}
394 \setcounter{footnote}{0}
395 \global\let\thanks\relax
396 \global\let\maketitle\relax
397 \global\let\@maketitle\relax
398 \global\let\@thanks\@empty
399 \global\let\@author\@empty
400 \global\let\@date\@empty
401 \global\let\title\relax
402 \global\let\author\relax
403 \global\let\date\relax

```

```

404 \global\let\and\relax
405 }
406 \else
407 \renewcommand\maketitle{
408 \btypeout{Title Page}
409 \markboth{\authornames}{\@title}
410 \thispagestyle{empty}
411 \par
412 \begingroup
413 \renewcommand\thefootnote{\@fnsymbol\c@footnote}
414 \def\@makefnmark{
415 \rlap{\@textsuperscript{\normalfont\@thefnmark}}
416 }
417 \long\def\@makefntext##1{
418 \parindent 1em\noindent \hb@xt@1.8em
419 {\hss\@textsuperscript{\normalfont\@thefnmark}}##1
420 }
421 \if@twocolumn
422 \ifnum \col@number=\@ne
423 \maketitle
424 \else
425 \twocolumn[\maketitle]%
426 \fi
427 \else
428 \newpage
429 % Prevent figures from going at top of page.
430 \global\@topnum\z@
431 \maketitle
432 \fi
433 \thispagestyle{plain}\@thanks
434 \endgroup
435 \setcounter{footnote}{0}%
436 \global\let\thanks\relax
437 \global\let\maketitle\relax
438 \global\let\@maketitle\relax
439 \global\let\@thanks\@empty
440 \global\let\@author\@empty
441 \global\let\@date\@empty
442 \global\let\title\relax
443 \global\let\author\relax
444 \global\let\date\relax
445 \global\let\and\relax
446 }
447 \def\@maketitle{
448 \newpage
449 \null
450 \vskip 2em
451 \begin{center}
452 \let \footnote \thanks
453 {\LARGE \@title \par}
454 \vskip 1.5em
455 {\large \lineskip .5em
456 \begin{tabular}[t]{c} \authornames \end{tabular}
457 \par}

```

```

458     \vskip 0.7em
459     {\large \lineskip .5em
460       \begin{tabular}[t]{c} \addressnames \end{tabular}
461     \par}
462     \vskip 1em
463     {\large \@date}
464   \end{center}
465   \par
466   \vskip 1.5em
467 }
468 \fi
469 \</article>

```

7.2 Abstract Page

`\abstract` Setup an appropriate abstract page.

```

470 <{*thesis | minithesis | progress | project | report | gdp}
471 \newenvironment{abstract}
472 {
473   \btypeout{Abstract Page}
474   \thispagestyle{empty}
475   \null\vfil
476   \begin{center}
477     \setlength{\parskip}{0pt}
478     {\textsc\normalsize \univname \par}
479     \bigskip
480     {\underline{Abstract} \par}
481     \bigskip
482     {\textsc\normalsize \facname \par}
483     <{*thesis | minithesis | progress | project | report}
484     {\textsc\normalsize \deptname \par}
485     </thesis | minithesis | progress | project | report}
486     \bigskip
487     <{*thesis}
488     {\normalsize \underline{Doctor of Philosophy}\par}
489     </thesis}
490     <{*minithesis}
491     {\normalsize \underline{A mini-thesis submitted for transfer from MPhil to PhD}\par}
492     </minithesis}
493     <{*progress}
494     {\normalsize \underline{A progress report submitted for continuation towards a PhD}\par}
495     </progress}
496     <{*project}
497     {\normalsize \underline{A project report submitted for the award of \degree}\par}
498     </project}
499     <{*gdp}
500     {\normalsize \underline{A group design project report submitted for the award of \degree}
501     </gdp}
502     \bigskip
503     {\normalsize\bf \@title \par}
504     \medskip
505     {\normalsize by \authornames \par}
506     \bigskip

```

```

507 \end{center}
508 }
509 {
510 \vfil\vfil\vfil\null
511 \cleardoublepage
512 }
513 </thesis | minithesis | progress | project | report | gdp>
514 <*article>
515 \if@titlepage
516 \renewenvironment{abstract}{
517 \titlepage
518 \null\vfil
519 \@beginparpenalty\@lowpenalty
520 \begin{center}
521 \bfseries \abstractname
522 \@endparpenalty\@M
523 \end{center}
524 \begin{itshape}
525 \noindent
526 }
527 {
528 \par
529 \end{itshape}
530 \if\keywordnames
531 \else
532 \quote
533 \vskip 1.5em
534 {\noindent \normalsize
535 \textbf{Keywords:}
536 \textit{\keywordnames}
537 \par}
538 \endquote
539 \fi
540 \vfil\null\endtitlepage
541 }
542 \else
543 \renewenvironment{abstract}{
544 \if@twocolumn
545 \section*{\abstractname}
546 \else
547 \small
548 \begin{center}
549 {\bfseries \abstractname\vspace{-.5em}\vspace{\z@}}
550 \end{center}
551 \quote
552 \fi
553 \begin{itshape}
554 }
555 {
556 \end{itshape}
557 \if\keywordnames
558 \else
559 \vskip 1.5em
560 {\noindent \normalsize

```

```

561         \textbf{Keywords:}
562         \textit{\keywordnames}
563     \par}
564 \fi
565 \if@twocolumn\else\endquote\fi
566 }
567 \fi
568 \</article>

```

7.3 Contents Pages

7.3.1 Add to Table of Contents

`\addtotoc` Ensures numbering for sub-subsections in the table of contents, and provide for 6 levels to appear in toc. Define `addtotoc` to enable adding elements to the toc at chapter level, using a dummy counter to fix bookmarks in pdfL^AT_EX.

```

569 <*thesis | minithesis | progress | project | report | gdp | article>
570 \addtocounter{secnumdepth}{1}
571 \setcounter{tocdepth}{6}
572 \newcounter{dummy}
573 \newcommand\addtotoc[1]{
574 \refstepcounter{dummy}
575 <*thesis | minithesis | progress | project | report | gdp>
576 \addcontentsline{toc}{chapter}{#1}}
577 \</thesis | minithesis | progress | project | report | gdp>
578 <*article>
579 \addcontentsline{toc}{section}{#1}}
580 \</article>

```

7.3.2 Table of Contents

`\tableofcontents` Adjust line and paragraph spacing.

```

581 \renewcommand\tableofcontents{
582 \hypersetup{linkcolor=black}}
583 \btypeout{Table of Contents}
584 \begin{spacing}{1}{
585     \setlength{\parskip}{1pt}
586     \if@twocolumn
587         \@restonecoltrue\onecolumn
588     \else
589         \@restonecolfalse
590     \fi
591 <*thesis | minithesis | progress | project | report | gdp>
592     \chapter*{\contentsname
593 \</thesis | minithesis | progress | project | report | gdp>
594 <*article>
595     \section*{\contentsname
596 \</article>
597     \@mkboth{
598         \MakeUppercase\contentsname}{\MakeUppercase\contentsname}}
599     \@starttoc{toc}
600     \if@restonecol\twocolumn\fi
601 <thesis | minithesis | progress | project | report | gdp> \cleardoublepage

```



```

602 }\end{spacing}
603 }

```

7.3.3 List of Figures

`\listoffigures` Adjust line and paragraph spacing.

```

604 \renewcommand\listoffigures{
605 \addtotoc{\listfigurename}
606 \begin{spacing}{1}{
607   \setlength{\parskip}{1pt}
608   \if@twocolumn
609     \@restonecoltrue\onecolumn
610   \else
611     \@restonecolfalse
612   \fi
613 }*thesis | minithesis | progress | project | report | gdp)
614   \chapter*{\listfigurename
615 }/thesis | minithesis | progress | project | report | gdp)
616 (*article)
617   \section*{\listfigurename
618 }/article)
619   \@mkboth{\MakeUppercase\listfigurename}
620             {\MakeUppercase\listfigurename}}
621   \@starttoc{lof}
622   \if@restonecol\twocolumn\fi
623 }*thesis | minithesis | progress | project | report | gdp)
624   \cleardoublepage
625 }/thesis | minithesis | progress | project | report | gdp)
626 }\end{spacing}
627 }

```

7.3.4 List of Tables

`\listoftables` Adjust line and paragraph spacing.

```

628 \renewcommand\listoftables{
629 \addtotoc{\listtablename}
630 \begin{spacing}{1}{
631   \setlength{\parskip}{1pt}
632   \if@twocolumn
633     \@restonecoltrue\onecolumn
634   \else
635     \@restonecolfalse
636   \fi
637 }*thesis | minithesis | progress | project | report | gdp)
638   \chapter*{\listtablename
639 }/thesis | minithesis | progress | project | report | gdp)
640 (*article)
641   \section*{\listtablename
642 }/article)
643   \@mkboth{
644     \MakeUppercase\listtablename}{\MakeUppercase\listtablename}}
645   \@starttoc{lot}
646   \if@restonecol\twocolumn\fi

```

```

647 <{*thesis | minithesis | progress | project | report | gdp>
648     \cleardoublepage
649 </thesis | minithesis | progress | project | report | gdp>
650 } \end{spacing}
651 }

```

7.4 List of Symbols

```

\listsymbolname Provide a listofsymbols command to produce a list of symbols,
\listofsymbols
652 <{*thesis | minithesis | progress | report | article>
653 \newcommand\listsymbolname{Definitions and Abbreviations}
654 </thesis | minithesis | progress | report | article>
655 <{*project | gdp>
656 \newcommand\listsymbolname{List of Symbols}
657 </project | gdp>
658 \usepackage{longtable}
659 \newcommand\listofsymbols[2]{
660 \btypeout{\listsymbolname}
661 \addtotoc{\listsymbolname}
662 <{*thesis | minithesis | progress | project | report | gdp>
663     \chapter*{\listsymbolname
664 </thesis | minithesis | progress | project | report | gdp>
665 <{*article>
666     \section*{\listsymbolname
667 </article>
668     \@mkboth{
669         \MakeUppercase\listsymbolname}{\MakeUppercase\listsymbolname}}
670 \begin{longtable}[c]{#1}#2\end{longtable}\par
671 <{*thesis | minithesis | progress | project | report | gdp>
672     \cleardoublepage
673 </thesis | minithesis | progress | project | report | gdp>
674 }
675 </thesis | minithesis | progress | project | report | gdp | article>

```

7.5 Declaration of Authorship

```

\authorshipdeclaration Taken from Modified Template by Lovell ??
    TODO: Consider a separate dissertation class for non technical?
    TODO: Provide extra argument for putting the date into the Declaration
    TODO: make slightly different declarations for theses and projects
    This Authorship macro takes one argument for the case of People who have
    published part of their thesis already (perhaps in a paper).
    xifthen else package used for the isempty command
676 <{*thesis | minithesis | progress | report | article>
677 \usepackage{xifthen}
678 \newcommand\authorshipdeclaration[1]{
679 \btypeout{Declaration of Authorship}
680 \addtotoc{Declaration of Authorship}
681 \thispagestyle{plain}
682 \null\vfil
683 \vskip 60\p@
684 \begin{center}{\Large\bf Declaration of Authorship \par}\end{center}

```

```

685 I declare that this thesis and the work presented in it is my own and has
686 been generated by me as the result of my own original research.
687
688 I confirm that:
689
690 \begin{enumerate}
691 \item This work was done wholly or mainly while in candidature for a research degree at this U
692 \item Where any part of this thesis has previously been submitted for a degree or any other q
693 \item Where I have consulted the published work of others, this is always clearly attributed;
694 \item Where I have quoted from the work of others, the source is always given. With the except
695 \item I have acknowledged all main sources of help;
696 \item Where the thesis is based on work done by myself jointly with others, I have made clear
697
698 \ifthenelse{\isempty{#1}}
699 {\item None of this work has been published before submission}
700 {\item Parts of this work have been published as: #1}
701 \end{enumerate}
702
703 \vspace{15.0mm}
704 \begin{minipage}[t]{0.7\textwidth}
705 Signed:.....
706 \end{minipage}%
707 \begin{minipage}[t]{0.3\textwidth}
708 Date:.....
709 \end{minipage}
710 \vfil\vfil\vfil
711 \cleardoublepage
712 }
713 </thesis | minithesis | progress | report | article>

```

7.6 Copyright Statement

`\copyrightDeclaration` This standard Copyright statement is to be included for a thesis submission to University of Southampton Digital Repository

```

714 <{*thesis}
715 \usepackage[export]{adjustbox} % for Soton logo alignment
716 \newcommand\copyrightDeclaration[1]{
717
718 \btypeout{Copyright declaration}
719 \thispagestyle{plain}
720
721 \hspace{-1.5in}\hspace{2.5cm}\begin{minipage}{17cm}
722 \null\vfil
723 \includegraphics[width=6cm,right]{UoSLogo.png}
724
725 \vskip 60\p@
726 \begin{center}{\selectfont\huge
727 \textcolor{custGray}{University~of~Southampton~Research~Repository}}\par}
728 \end{center}
729 \vspace{1cm}
730
731 {\fontfamily{fds}\selectfont
732

```

733 \noindent Copyright \textcopyright~ and Moral Rights for this thesis and, where
734 applicable, any accompanying data are retained by the author and/or other
735 copyright owners. A copy can be downloaded for personal non-commercial research
736 or study, without prior permission or charge. This thesis and the accompanying
737 data cannot be reproduced or quoted extensively from without first obtaining
738 permission in writing from the copyright holder/s. The content of the thesis
739 and accompanying research data (where applicable) must not be changed in any
740 way or sold commercially in any format or medium without the formal permission
741 of the copyright holder/s.

742

743 \vspace{0.5cm}

744

745 When referring to this thesis and any accompanying data, full bibliographic
746 details must be given, e.g.

747

748 \vspace{0.5cm}

749

750 Thesis: Author (Year of Submission) "Full thesis title", University of
751 Southampton, name of the University Faculty or School or Department,
752 PhD Thesis, pagination.

753

754 \vspace{0.5cm}

755

756 Data: Author (Year) Title. URI [dataset]]

757 \end{minipage}

758 \vfil\vfil\null

759 \cleardoublepage

760 }

761

762 \usepackage{lastpage} % counts the full number of pages

763

764 </thesis>

7.7 Acknowledgements

\acknowledgements Thank someone!

765 \newcommand\acknowledgements[1]{

766 \btypeout{Acknowledgements}

767 \addtotoc{Acknowledgements}

768 <*thesis | minithesis | progress | project | report | gdp>

769 \thispagestyle{plain}

770 \null\vfil

771 \vskip 60\p@

772 \begin{center}{\Large\bf Acknowledgements \par}\end{center}

773 {\normalsize #1}

774 \vfil\vfil\null

775 \cleardoublepage

776 </thesis | minithesis | progress | project | report | gdp>

777 <*article>

778 \section*{Acknowledgements}

779 {\normalsize #1}

780 </article>

781 }

7.8 Dedicatory

`\dedicatory` Dedicate the document to someone!

```
782 \newcommand\dedicatory[1]{
783 \btypeout{Dedicatory}
784 \*thesis | minithesis | progress | project | report | gdp)
785 \thispagestyle{plain}
786 \null\vfil
787 \vskip 60\p@
788 \begin{center}{\Large \sl #1}\end{center}
789 \vfil\null
790 \cleardoublepage
791 \</thesis | minithesis | progress | project | report | gdp)
792 }
```

8 Parts

`\frontmatter` Modify frontmatter.

```
793 \*article)
794 \newcommand\frontmatter{ }
795 \</article)
```

`\mainmatter` Modify mainmatter.

```
796 \*article)
797 \newcommand\mainmatter{ }
798 \</article)
```

`\backmatter` Modify backmatter to add the bibliography to the table of contents.

```
799 \*thesis | minithesis | progress | project | report | gdp)
800 \renewcommand\backmatter{
801   \if@openright
802     \cleardoublepage
803   \else
804     \clearpage
805   \fi
806   \addtotoc{\bibname}
807   \btypeout{\bibname}
808   \@mainmatterfalse}
809 \</thesis | minithesis | progress | project | report | gdp)
810 \*article)
811 \newcommand\bibname{References}
812 \newcommand\backmatter{
813   \addtotoc{\bibname}
814   \btypeout{\bibname}
815 }
816 \</article)

817 \</thesis | minithesis | progress | project | report | article | gdp | gdpsummary)
```

9 Example Documents

```

818 (*testthesis)
819 \documentclass[sotoncolour]{uosthesis}      % Use the Thesis Style with custom link colour
820 \end{document}
821 (*testminithesis)
822 \documentclass[sotoncolour]{uosminithesis}  % Use the minithesis Style with custom link colour
823 \end{document}
824 (*testprogress)
825 \documentclass[sotoncolour]{uosprogress}    % Use the progress Style with custom link colour
826 \end{document}
827 (*testproject)
828 \documentclass[sotoncolour]{uosproject}     % Use the Project Style with custom link colour
829 \end{document}
830 (*testreport)
831 \documentclass[sotoncolour]{uosreport}      % Use the Report Style with custom link colour
832 \end{document}
833 (*testarticle)
834 \documentclass[sotoncolour]{uosarticle}     % Use the Article Style with custom link colour
835 \end{document}
836 (*testgdp)
837 \documentclass[sotoncolour]{uosgdp}         % Use the GDP Report Style with custom link colour
838 \end{document}
839 (*testgdpsummary)
840 \documentclass[sotoncolour]{uosgdpsummary}  % Use the GDP Summary Report Style with custom link colour
841 \end{document}
842 (*testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary)
843 \graphicspath{{../Figures/}}              % Location of your graphics files
844 \usepackage{natbib}                        % Use Natbib style for the refs.
845 (*testthesis | testminithesis | testproject | testreport | testgdp)
846 \usepackage{bibentry}                      % Use bibentry for prepublished works
847 \nobibliography*                           % Use bibentry for prepublished works
848 \end{document}
849 \hypersetup{colorlinks=true}               % Set to false for black/white printing
850 \input{Definitions}                        % Include your abbreviations
851 %% -----
852 %% -----THESIS/DOC INFORMATION -----
853 \title{An Investigation into \dots}
854 (*testthesis)
855 \authors{Steve R. Gunn} % Use of Soton Email unadvised, use ORCID instead.
856 \end{document}
857 (*testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary)
858 \authors{\texorpdfstring
859 {\href{mailto:S.R.Gunn@ecs.soton.ac.uk}{Steve R. Gunn}}
860 {Steve R. Gunn}
861 }
862 \end{document}
863 \addresses{\groupname\\deptname\\univname}
864 \date{\today}
865 (*testminithesis | testprogress | testproject | testgdp | testgdpsummary)
866 \supervisor{Mr Beavis}
867 \examiner{Dr Butthead}
868 \end{document}
869 (*testproject)
870 \degree{BEng Electronic Engineering}
871 \end{document}

```

```

872 < *testgdp | testgdpsummary >
873 \degree {Master of Engineering}
874 < /testgdp | testgdpsummary >
875 %% Optional Fields
876 (testthesis | testminithesis | testprogress) \qualifications{MEng PhD}
877 (*testthesis)
878 \orcidid{0000-0002-1825-0097}
879 \doi{10.1002/0470841559.ch1}
880 \volume{n}{m} %Optional Volume Numbering Volume n of m
881 < /testthesis >
882 \subject {}
883 \keywords {}
884
885 \begin{document}
886 %% ----- FRONT MATTER ORGANISATION -----
887 (*testthesis)
888 \pagenumbering{gobble} % removes page number
889 \copyrightDeclaration{} % !!! Comment this line when printing the hardcopy !!!
890 < /testthesis >
891 \frontmatter
892 \maketitle
893 < /testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary >
894 (*testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp)
895 \begin{abstract}
896 This work is all about \dots
897 \end{abstract}
898 (*testthesis | testminithesis | testprogress | testproject | testreport | testgdp)
899 \tableofcontents
900 \listoffigures
901 \listoftables
902 %% The List of listings does not, by default, appear in the ToC, so....
903 \addtotoc{List of Listings}
904 \lstlistoflistings
905 (*testthesis | testminithesis | testproject | testreport | testgdp)
906 %% ----- AUTHORSHIP DECLARATION/ ACKNOW. / DEDICATORY -----
907 %% Either include citations like below (as many as required spaced with commas or 'and').
908 %% \bibentry command must be used here with republished papers
909 % https://www.stefaanlippens.net/bibentry/
910 \authorshipdeclaration{\bibentry{Gunn:2001:pdflatex}, \bibentry{Lovell:2011:updated} and \bibentry{...}}
911 %% Or state no citations like below
912 %% \authorshipdeclaration{}
913 %% -----
914 \acknowledgements{Thanks to no one.}
915 \dedicatory{To \dots}
916 < /testthesis | testminithesis | testproject | testreport | testgdp >
917 %% Lightweight Definitions and Abbreviations see package:nomencl for alternative
918 \listofsymbols{ll}{\mathbf{w}} & The weight vector}
919 < /testthesis | testminithesis | testprogress | testproject | testreport | testgdp >
920 < /testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp >
921 (*testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary)
922 \mainmatter
923 %% ----- MAIN MATTER (CONTENT) -----
924 < /testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary >
925 (*testthesis | testminithesis | testprogress | testproject | testreport | testgdp)

```

```

926 \include{Introduction}
927 \include{Conclusions}
928 \begin{lstlisting}[caption=Without a title it doesn't appear in the table]
929 This is a test listing
930
931 It has several lines
932 That
933 say not much at all
934 \end{lstlisting}
935 \appendix
936 \include{AppendixA}
937 \backmatter
938 \bibliographystyle{uos}
939 \bibliography{UOS}
940 </testthesis | testminithesis | testprogress | testproject | testreport | testgdp>
941 <*testgdpsummary>
942 \section*{Introduction}
943 \section*{Objectives}
944 \section*{Resources}
945 \section*{Constraints}
946 \section*{Approaching the task}
947 \section*{Team Organisation}
948 \section*{Important Results}
949 \section*{Conclusions}
950 \section*{Recommendations}
951 </testgdpsummary>
952 <*introduction>
953 \chapter{Introduction} \label{Chapter:Introduction}
954 </introduction>
955 <*testarticle>
956 \section{Introduction} \label{Section:Introduction}
957 </testarticle>
958 <*introduction | testarticle>
959 You probably found all the files from \cite{Gunn:2001:pdflatex}.
960 \tref{Table:tabex} illustrates the results of my work.
961 \begin{table}[!htb]
962   \centering
963   \begin{tabular}{cc}
964     \toprule
965     \textbf{Training Error} & \textbf{Testing Error}\\
966     \midrule
967     0 &  $\infty$ \\
968     \bottomrule
969   \end{tabular}
970   \caption{The Results}
971   \label{Table:tabex}
972 \end{table}
973
974 \fref{Figure:figex} shows why this is the case.
975 \begin{figure}[!htb]
976   \centering
977   \includegraphics[width=8cm]{figure}
978   \caption{A colourful picture.}
979   \label{Figure:figex}

```



```

980 \end{figure}
981
982 This page shows you a subfigure example in \fref{Figure:figsubex}.
983 \begin{figure}[!htb]
984   \centering
985   \subcaptionbox{The left caption}{
986     \includegraphics[width=4.2cm]{figure}
987     \label{Figure:figsubex:left}
988   }
989   \subcaptionbox{The right caption}{
990     \includegraphics[width=4.2cm]{figure}
991     \label{Figure:figsubex:right}
992   }
993   \caption{A doubly colourful picture.}
994   \label{Figure:figsubex}
995 \end{figure}
996 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec rutrum sodales ligula, ac aliquam
997
998 Nulla molestie velit sed dui ullamcorper viverra. Fusce placerat vulputate lacus eu consequat.
999
1000 Nam egestas felis euismod erat tincidunt ornare. Nulla hendrerit tempor purus ac consequat. Aliquam
1001
1002 Pellentesque sodales lobortis feugiat. Vivamus volutpat mauris id odio aliquam maximus sed sit amet.
1003
1004 Donec vitae massa nisi. Praesent sed sollicitudin urna. Suspendisse vitae cursus tortor. In egestas
1005 \</introduction | testarticle>
1006 \< *conclusions>
1007 \chapter{Conclusions} \label{Chapter: Conclusions}
1008 \</conclusions>
1009 \< *testarticle>
1010 %% -----
1011 \section{Conclusions} \label{Section: Conclusions}
1012 \</testarticle>
1013 \< *conclusions | testarticle>
1014 It works.
1015 \</conclusions | testarticle>
1016 \< *testarticle>
1017 \acknowledgements{Thanks to no one.}
1018 \backmatter
1019 \bibliographystyle{uos}
1020 \bibliography{UOS}
1021 \appendix
1022 \</testarticle>
1023 \< *appendix | testarticle>
1024 \< *appendix>
1025 \chapter{Stuff} \label{Chapter: Stuff}
1026 \</appendix>
1027 \< *testarticle>
1028 %% -----
1029 \section{Stuff} \label{Section: Stuff}
1030 \</testarticle>
1031 The following gets in the way of the text....
1032 \</appendix | testarticle>
1033 \< *testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary>

```

```

1034 \end{document}
1035 %% -----
1036 </testthesis | testminithesis | testprogress | testproject | testreport | testarticle | testgdp | testgdpsummary>

```

9.1 Example Figure

```

1037 <*figure>
1038 %%BoundingBox: 0 150 600 650
1039 %%EndComments
1040 0.0 setlinewidth
1041 /length 0.1 def
1042 /width 0.02 def
1043 /hsvcircle {
1044   gsave
1045     /h 0.0 def
1046     0 4 360 {
1047       pop
1048       gsave
1049       0.5 0.0 translate
1050       newpath
1051       0.0 0.0 moveto
1052       length 0.0 lineto
1053       length width lineto
1054       0.0 width lineto
1055       closepath
1056       h 1.0 1.0 sethsbcolor
1057       fill
1058       grestore
1059       /h h 4 360 div add def
1060       4 rotate
1061     } for
1062   grestore
1063 } def
1064 0.0 setlinewidth
1065 0.0 setgray
1066 300 400 translate
1067 500 500 scale
1068 30 rotate
1069 1.0 0.7 scale
1070 -30 rotate
1071 hsvcircle
1072 0.8 0.8 scale
1073 hsvcircle
1074 0.8 0.8 scale
1075 hsvcircle
1076 0.8 0.8 scale
1077 hsvcircle
1078 0.8 0.8 scale
1079 hsvcircle
1080 0.8 0.8 scale
1081 hsvcircle
1082 0.8 0.8 scale
1083 hsvcircle
1084 showpage
1085 </figure>

```

9.2 Definitions File

```

1086 (*definitions)
1087 \newcommand{\BibTeX}{\rm B\kern-.05em{\sc i\kern-.025em b}\kern-.08em T\kern-.1667em\lower.7em\hbox{e}}
1088
1089 %% People
1090 \newcounter{address}
1091 \setcounter{address}{1}
1092 \renewcommand{\theaddress}{\textsuperscript{\fnsymbol{address}}}
1093 \newcommand{\address}[1]{\refstepcounter{address}\theaddress#1\\}
1094 \newcommand{\Name}[3]{\texorpdfstring{\href{mailto:#3}{#2}#1}{#2}\xspace}
1095 \newcommand{\SteveRGunn}[1]{\Name{#1}{Steve R. Gunn}{S.R.Gunn@ecs.soton.ac.uk}}
1096
1097 %% Dingbats
1098 \newcommand{\tick}{\ding{51}}
1099 \newcommand{\cross}{\ding{55}}
1100
1101 %% Calculus
1102 \newcommand{\pd}[2]{\ensuremath{\frac{\partial \#1}{\partial \#2}}\xspace}
1103 \newcommand{\fd}[2]{\ensuremath{\frac{d \#1}{d \#2}}\xspace}
1104 \newcommand{\dint}{\ensuremath{\int\!\!\!\int}\xspace}
1105 \newcommand{\tint}{\ensuremath{\int\!\!\!\int\!\!\!\int}\xspace}
1106
1107 %% Math Sets
1108 \newcommand{\Q}[1]{\ensuremath{\mathbb{#1}}\xspace}
1109 \newcommand{\R}{\Q{\R}}
1110
1111 %% Matrix, Vector
1112 \newcommand{\V}[1]{\ensuremath{\boldsymbol{\#1}}\xspace}
1113 \newcommand{\M}[1]{\ensuremath{\boldsymbol{\#1}}\xspace}
1114 \newcommand{\0}{\V{0}}
1115 \newcommand{\1}{\V{1}}
1116 \newcommand{\I}{\M{I}}
1117
1118 %% Math Functions
1119 \newcommand{\F}[1]{\ensuremath{\mathrm{\#1}}\xspace}
1120 \newcommand{\sgn}{\F{sgn}}
1121 \newcommand{\tr}{\F{trace}}
1122 \newcommand{\diag}{\F{diag}}
1123
1124 %% Math Names
1125 \newcommand{\N}[1]{\ensuremath{\mathit{\#1}}\xspace}
1126
1127 %% Data
1128 \newcommand{\mc}[1]{\ensuremath{\mathcal{\#1}}\xspace}
1129 \newcommand{\Hyp}{\mc{H}}
1130 \newcommand{\D}{\mc{D}}
1131
1132 %% Kernel
1133 \newcommand{\K}{\M{K}}
1134 \newcommand{\eins}{\texorpdfstring{\ensuremath{\epsilon}}{\textepsilon}-insensitive\xspace}
1135 \newcommand{\e}{\ensuremath{\epsilon}\xspace}
1136 \newcommand{\Bxi}{\ensuremath{\boldsymbol{\xi}}\xspace}
1137 \newcommand{\Kanova}{\ensuremath{\mathit{K}_{\text{ANOVA}}}\xspace}

```

```

1138 \newcommand{\Kspline}{\ensuremath{\mathit{K}_{\text{spline}}}}\xspace
1139
1140 %% Bayesian
1141 \newcommand{\MP}{\ensuremath{\mathit{M}\hspace{-1.5pt}\hspace{-1.5pt}P}}\xspace
1142 \newcommand{\ML}{\ensuremath{\mathit{M}\hspace{-1.5pt}\hspace{-1.5pt}L}}\xspace
1143 \newcommand{\Qw}{\ensuremath{Q_{\text{w}}(\text{w})}}\xspace
1144 \newcommand{\Qa}{\ensuremath{Q_{\text{a}}(\text{a})}}\xspace
1145 \newcommand{\Qb}{\ensuremath{Q_{\text{b}}(\text{b})}}\xspace
1146 \newcommand{\wMPab}{\ensuremath{w_{\text{MP}}(\text{a}, \text{b})}}\xspace
1147 \newcommand{\wMP}{\ensuremath{w_{\text{MP}}}}\xspace
1148 \newcommand{\yMP}{\ensuremath{y_{\text{MP}}}}\xspace
1149 \newcommand{\BaMP}{\ensuremath{B_{\text{a}}(\text{MP})}}\xspace
1150 \newcommand{\aMP}{\ensuremath{\alpha_{\text{MP}}}}\xspace
1151 \newcommand{\bMP}{\ensuremath{\beta_{\text{MP}}}}\xspace
1152 \newcommand{\Sab}{\ensuremath{M_{\text{a}}(\text{b})}}\xspace
1153 \newcommand{\Ba}{\ensuremath{\boldsymbol{\alpha}}}\xspace
1154 \newcommand{\Bb}{\ensuremath{\boldsymbol{\beta}}}\xspace
1155 \newcommand{\Bm}{\ensuremath{\boldsymbol{\mu}}}\xspace
1156 \newcommand{\BL}{\ensuremath{\boldsymbol{\Lambda}}}\xspace
1157 \newcommand{\BPhi}{\ensuremath{\boldsymbol{\Phi}}}\xspace
1158 \newcommand{\SMP}{\ensuremath{M_{\text{MP}}}}\xspace
1159
1160 \newcommand{\Pa}{\ensuremath{P(\alpha|\mathcal{H})}}\xspace
1161 \newcommand{\Pb}{\ensuremath{P(\beta|\mathcal{H})}}\xspace
1162 \newcommand{\Pab}{\ensuremath{P(\alpha, \beta|\mathcal{H})}}\xspace
1163 \newcommand{\Pw}{\ensuremath{P(w|\mathcal{H})}}\xspace
1164 \newcommand{\PD}{\ensuremath{P(D|\mathcal{H})}}\xspace
1165 \newcommand{\PwIa}{\ensuremath{P(w|\alpha, \mathcal{H})}}\xspace
1166 \newcommand{\PDIwb}{\ensuremath{P(D|w, \beta, \mathcal{H})}}\xspace
1167 \newcommand{\PDwab}{\ensuremath{P(D, w, \alpha, \beta|\mathcal{H})}}\xspace
1168 \newcommand{\PDIw}{\ensuremath{P(D|w, \mathcal{H})}}\xspace
1169 \newcommand{\PwID}{\ensuremath{P(w|D, \mathcal{H})}}\xspace
1170 \newcommand{\PwabID}{\ensuremath{P(w, \alpha, \beta|D, \mathcal{H})}}\xspace
1171
1172 \newcommand{\PanH}{\ensuremath{P(\alpha)}}\xspace
1173 \newcommand{\PbnH}{\ensuremath{P(\beta)}}\xspace
1174 \newcommand{\PabnH}{\ensuremath{P(\alpha, \beta)}}\xspace
1175 \newcommand{\PwnH}{\ensuremath{P(w)}}\xspace
1176 \newcommand{\PDnH}{\ensuremath{P(D)}}\xspace
1177 \newcommand{\PwIanH}{\ensuremath{P(w|\alpha)}}\xspace
1178 \newcommand{\PDIwnH}{\ensuremath{P(D|w, \beta)}}\xspace
1179 \newcommand{\PDwabnH}{\ensuremath{P(D, w, \alpha, \beta)}}\xspace
1180 \newcommand{\PDIwnH}{\ensuremath{P(D|w)}}\xspace
1181 \newcommand{\PwIDnH}{\ensuremath{P(w|D)}}\xspace
1182 \newcommand{\PwabIDnH}{\ensuremath{P(w, \alpha, \beta|D)}}\xspace
1183
1184 \newcommand{\PDwBab}{\ensuremath{P(D, w, \alpha, \beta|\mathcal{H})}}\xspace
1185 \newcommand{\PwIBa}{\ensuremath{P(w|\alpha, \mathcal{H})}}\xspace
1186 \newcommand{\PBab}{\ensuremath{P(\alpha, \beta|\mathcal{H})}}\xspace
1187 \newcommand{\PwBabID}{\ensuremath{P(w, \alpha, \beta|D, \mathcal{H})}}\xspace
1188
1189 \newcommand{\PBanH}{\ensuremath{P(\alpha)}}\xspace
1190 \newcommand{\PwIBanH}{\ensuremath{P(w|\alpha)}}\xspace
1191

```

```

1192 %% Snakes
1193 \newcommand{\Esnake}{\ensuremath{\mathit{E}_{\text{snake}}}\xspace}
1194 \newcommand{\Eimage}{\ensuremath{\mathit{E}_{\text{image}}}\xspace}
1195 \newcommand{\Econt}{\ensuremath{\mathit{E}_{\text{cont}}}\xspace}
1196 \newcommand{\Ecurv}{\ensuremath{\mathit{E}_{\text{curv}}}\xspace}
1197 \newcommand{\Eint}{\ensuremath{\mathit{E}_{\text{int}}}\xspace}
1198 \newcommand{\Eext}{\ensuremath{\mathit{E}_{\text{ext}}}\xspace}
1199 \newcommand{\Eterm}{\ensuremath{\mathit{E}_{\text{term}}}\xspace}
1200 \newcommand{\Eline}{\ensuremath{\mathit{E}_{\text{line}}}\xspace}
1201 \newcommand{\Edge}{\ensuremath{\mathit{E}_{\text{edge}}}\xspace}
1202 \newcommand{\Econ}{\ensuremath{\mathit{E}_{\text{con}}}\xspace}
1203 \newcommand{\Eangle}{\ensuremath{\mathit{E}_{\text{angle}}}\xspace}
1204 \newcommand{\Elshape}{\ensuremath{\mathit{E}_{\text{lshape}}}\xspace}
1205 \newcommand{\Edgedir}{\ensuremath{\mathit{E}_{\text{edgedir}}}\xspace}
1206 \newcommand{\Emodel}{\ensuremath{\mathit{E}_{\text{model}}}\xspace}
1207 \newcommand{\wte}{\ensuremath{\mathit{w}_{\text{term}}}\xspace}
1208 \newcommand{\wli}{\ensuremath{\mathit{w}_{\text{line}}}\xspace}
1209 \newcommand{\wed}{\ensuremath{\mathit{w}_{\text{edge}}}\xspace}
1210 \newcommand{\wco}{\ensuremath{\mathit{w}_{\text{con}}}\xspace}
1211
1212
1213 %% Environments
1214 \newcounter{alg}
1215 \newenvironment{algorithm}[1]
1216 {
1217     \stepcounter{alg}
1218     \begin{table}[htb]
1219     \centering
1220     \begin{tabular}[t]{l}
1221     \hline&
1222     \multicolumn{2}{l}{\bf Algorithm \arabic{alg}: #1}\&
1223     \end{tabular}
1224     &
1225     \hline
1226     \end{tabular}
1227     \end{table}
1228 }
1229 </definitions>

```

9.3 References File

```

1230 <*references>
1231 @MISC{Gunn:2001:pdflatex,
1232   author = {S.R. Gunn},
1233   title = {PDFLaTeX Instructions},
1234   year = {2001},
1235   url = {http://www.ecs.soton.ac.uk/~srg/softwaretools/document/}
1236 }
1237 @MISC{Lovell:2011:updated,
1238   author = {C. J. Lovell},
1239   title = {Updated templates},
1240   year = {2011}
1241 }
1242 @MISC{Gunn:2011:updated2,
1243   author = {S.R. Gunn and C. J. Lovell},

```

```

1244 title =          {Updated templates reference 2},
1245 year =           {2011}
1246 }
1247
1248 </references>

```

9.4 Bibliography Style File

```

1249 <*bst>
1250 %% File: 'uos.bst'
1251 %% A modification of 'plainnat.bst' for use with natbib package
1252 %%
1253 %% Copyright 1993-1999 Patrick W Daly
1254 %% Max-Planck-Institut f\ur Aeronomie
1255 %% Max-Planck-Str. 2
1256 %% D-37191 Katlenburg-Lindau
1257 %% Germany
1258 %% E-mail: daly@linmpi.mpg.de
1259 %%
1260 %% This program can be redistributed and/or modified under the terms
1261 %% of the LaTeX Project Public License Distributed from CTAN
1262 %% archives in directory macros/latex/base/lppl.txt; either
1263 %% version 1 of the License, or any later version.
1264 %%
1265 %% Includes field URL for Internet addresses
1266 %%
1267 ENTRY
1268 { address
1269   author
1270   booktitle
1271   chapter
1272   edition
1273   editor
1274   howpublished
1275   institution
1276   isbn
1277   issn
1278   journal
1279   key
1280   month
1281   note
1282   number
1283   organization
1284   pages
1285   publisher
1286   school
1287   series
1288   title
1289   type
1290   url
1291   volume
1292   year
1293 }
1294 {}
1295 { label extra.label sort.label short.list }

```

```

1296
1297 INTEGERS { output.state before.all mid.sentence after.sentence after.block }
1298
1299 FUNCTION {init.state.consts}
1300 { #0 'before.all :=
1301   #1 'mid.sentence :=
1302   #2 'after.sentence :=
1303   #3 'after.block :=
1304 }
1305
1306 STRINGS { s t }
1307
1308 FUNCTION {output.nonnull}
1309 { 's :=
1310   output.state mid.sentence =
1311   { ", " * write$ }
1312   { output.state after.block =
1313     { add.period$ write$
1314       newline$
1315       "\newblock " write$
1316     }
1317     { output.state before.all =
1318       'write$
1319       { add.period$ " " * write$ }
1320     if$
1321   }
1322   if$
1323   mid.sentence 'output.state :=
1324 }
1325 if$
1326 s
1327 }
1328
1329 FUNCTION {output}
1330 { duplicate$ empty$
1331   'pop$
1332   'output.nonnull
1333   if$
1334 }
1335
1336 FUNCTION {output.check}
1337 { 't :=
1338   duplicate$ empty$
1339   { pop$ "empty " t * " in " * cite$ * warning$ }
1340   'output.nonnull
1341   if$
1342 }
1343
1344 FUNCTION {fin.entry}
1345 { add.period$
1346   write$
1347   newline$
1348 }
1349

```

```

1350 FUNCTION {new.block}
1351 { output.state before.all =
1352   'skip$
1353   { after.block 'output.state := }
1354   if$
1355 }
1356
1357 FUNCTION {new.sentence}
1358 { output.state after.block =
1359   'skip$
1360   { output.state before.all =
1361     'skip$
1362     { after.sentence 'output.state := }
1363     if$
1364   }
1365   if$
1366 }
1367
1368 FUNCTION {not}
1369 { { #0 }
1370   { #1 }
1371   if$
1372 }
1373
1374 FUNCTION {and}
1375 { 'skip$
1376   { pop$ #0 }
1377   if$
1378 }
1379
1380 FUNCTION {or}
1381 { { pop$ #1 }
1382   'skip$
1383   if$
1384 }
1385
1386 FUNCTION {new.block.checka}
1387 { empty$
1388   'skip$
1389   'new.block
1390   if$
1391 }
1392
1393 FUNCTION {new.block.checkb}
1394 { empty$
1395   swap$ empty$
1396   and
1397   'skip$
1398   'new.block
1399   if$
1400 }
1401
1402 FUNCTION {new.sentence.checka}
1403 { empty$

```



```

1404     'skip$
1405     'new.sentence
1406   if$
1407 }
1408
1409 FUNCTION {new.sentence.checkb}
1410 { empty$
1411   swap$ empty$
1412   and
1413   'skip$
1414   'new.sentence
1415   if$
1416 }
1417
1418 FUNCTION {field.or.null}
1419 { duplicate$ empty$
1420   { pop$ "" }
1421   'skip$
1422   if$
1423 }
1424
1425 FUNCTION {emphasize}
1426 { duplicate$ empty$
1427   { pop$ "" }
1428   { "{\em " swap$ * "}" * }
1429   if$
1430 }
1431
1432 INTEGERS { nameptr namesleft numnames }
1433
1434 FUNCTION {format.names}
1435 { 's :=
1436   #1 'nameptr :=
1437   s num.names$ 'numnames :=
1438   numnames 'namesleft :=
1439   { namesleft #0 > }
1440   { s nameptr "{ff~}{vv~}{ll}{, jj}" format.name$ 't :=
1441     nameptr #1 >
1442     { namesleft #1 >
1443       { ", " * t * }
1444       { numnames #2 >
1445         { "," * }
1446         'skip$
1447         if$
1448         t "others" =
1449         { " et~al." * }
1450         { " and " * t * }
1451         if$
1452       }
1453     } if$
1454   }
1455   't
1456   if$
1457   nameptr #1 + 'nameptr :=

```

```

1458     namesleft #1 - 'namesleft :=
1459     }
1460 while$
1461 }
1462
1463 FUNCTION {format.key}
1464 { empty$
1465   { key field.or.null }
1466   { "" }
1467   if$
1468 }
1469
1470 FUNCTION {format.authors}
1471 { author empty$
1472   { "" }
1473   { author format.names }
1474   if$
1475 }
1476
1477 FUNCTION {format.editors}
1478 { editor empty$
1479   { "" }
1480   { editor format.names
1481     editor num.names$ #1 >
1482       { ", editors" * }
1483       { ", editor" * }
1484       if$
1485   }
1486   if$
1487 }
1488
1489 FUNCTION {format.isbn}
1490 { isbn empty$
1491   { "" }
1492   { new.block "ISBN " isbn * }
1493   if$
1494 }
1495
1496 FUNCTION {format.issn}
1497 { issn empty$
1498   { "" }
1499   { new.block "ISSN " issn * }
1500   if$
1501 }
1502
1503 %FUNCTION {format.url}
1504 %{ url empty$
1505 %   { "" }
1506 %   { new.block "URL \url{" url * "}" * }
1507 %   if$
1508 %}
1509 %
1510 %FUNCTION {format.title}
1511 %{ title empty$

```

```

1512 % { "" }
1513 % { title "t" change.case$ }
1514 % if$
1515 %}
1516 FUNCTION {format.url}
1517 { ""
1518 }
1519
1520 FUNCTION {format.title}
1521 { title empty$
1522   { "" }
1523   { url empty$
1524     { title "t" change.case$ }
1525     { "\href{" url * "}{ " * title "t" change.case$ * "}" * }
1526     if$
1527   }
1528   if$
1529 }
1530
1531
1532 FUNCTION {format.full.names}
1533 {'s :=
1534 #1 'nameptr :=
1535 s num.names$ 'numnames :=
1536 numnames 'namesleft :=
1537 { namesleft #0 > }
1538 { s nameptr
1539   "{vv~}{ll}" format.name$ 't :=
1540   nameptr #1 >
1541   {
1542     namesleft #1 >
1543     { ", " * t * }
1544     {
1545       numnames #2 >
1546       { ", " * }
1547       'skip$
1548       if$
1549       t "others" =
1550       { " et~al." * }
1551       { " and " * t * }
1552       if$
1553     }
1554     if$
1555   }
1556   't
1557   if$
1558   nameptr #1 + 'nameptr :=
1559   namesleft #1 - 'namesleft :=
1560 }
1561 while$
1562 }
1563
1564 FUNCTION {author.editor.full}
1565 { author empty$

```

```

1566     { editor empty$
1567         { "" }
1568         { editor format.full.names }
1569         if$
1570     }
1571     { author format.full.names }
1572     if$
1573 }
1574
1575 FUNCTION {author.full}
1576 { author empty$
1577     { "" }
1578     { author format.full.names }
1579     if$
1580 }
1581
1582 FUNCTION {editor.full}
1583 { editor empty$
1584     { "" }
1585     { editor format.full.names }
1586     if$
1587 }
1588
1589 FUNCTION {make.full.names}
1590 { type$ "book" =
1591     type$ "inbook" =
1592     or
1593     'author.editor.full
1594     { type$ "proceedings" =
1595         'editor.full
1596         'author.full
1597         if$
1598     }
1599     if$
1600 }
1601
1602 FUNCTION {output.bibitem}
1603 { newline$
1604     "\bibitem[" write$
1605     label write$
1606     ")" make.full.names duplicate$ short.list =
1607         { pop$ }
1608         { * }
1609         if$
1610     "]" * write$
1611     cite$ write$
1612     ")" write$
1613     newline$
1614     ""
1615     before.all 'output.state :=
1616 }
1617
1618 FUNCTION {n.dashify}
1619 { 't :=

```

```

1620 ""
1621 { t empty$ not }
1622 { t #1 #1 substring$ "-" =
1623   { t #1 #2 substring$ "--" = not
1624     { "--" *
1625       t #2 global.max$ substring$ 't :=
1626     }
1627     { { t #1 #1 substring$ "-" = }
1628       { "-" *
1629         t #2 global.max$ substring$ 't :=
1630       }
1631     } while$
1632   }
1633   if$
1634 }
1635 { t #1 #1 substring$ *
1636   t #2 global.max$ substring$ 't :=
1637 }
1638 if$
1639 }
1640 while$
1641 }
1642
1643 FUNCTION {format.date}
1644 { year duplicate$ empty$
1645   { "empty year in " cite$ * warning$
1646     pop$ "" }
1647   'skip$
1648   if$
1649   month empty$
1650   'skip$
1651   { month
1652     " " * swap$ *
1653   }
1654   if$
1655   extra.label *
1656 }
1657
1658 FUNCTION {format.btitle}
1659 { title emphasize
1660 }
1661
1662 FUNCTION {tie.or.space.connect}
1663 { duplicate$ text.length$ #3 <
1664   { "~" }
1665   { " " }
1666   if$
1667   swap$ * *
1668 }
1669
1670 FUNCTION {either.or.check}
1671 { empty$
1672   'pop$
1673   { "can't use both " swap$ * " fields in " * cite$ * warning$ }

```

```

1674   if$
1675 }
1676
1677 FUNCTION {format.bvolume}
1678 { volume empty$
1679   { "" }
1680   { "volume" volume tie.or.space.connect
1681     series empty$
1682     'skip$
1683     { " of " * series emphasize * }
1684     if$
1685     "volume and number" number either.or.check
1686   }
1687   if$
1688 }
1689
1690 FUNCTION {format.number.series}
1691 { volume empty$
1692   { number empty$
1693     { series field.or.null }
1694     { output.state mid.sentence =
1695       { "number" }
1696       { "Number" }
1697       if$
1698       number tie.or.space.connect
1699       series empty$
1700       { "there's a number but no series in " cite$ * warning$ }
1701       { " in " * series * }
1702       if$
1703     }
1704     if$
1705   }
1706   { "" }
1707   if$
1708 }
1709
1710 FUNCTION {format.edition}
1711 { edition empty$
1712   { "" }
1713   { output.state mid.sentence =
1714     { edition "l" change.case$ " edition" * }
1715     { edition "t" change.case$ " edition" * }
1716     if$
1717   }
1718   if$
1719 }
1720
1721 INTEGERS { multiresult }
1722
1723 FUNCTION {multi.page.check}
1724 { 't :=
1725   #0 'multiresult :=
1726   { multiresult not
1727     t empty$ not

```

```

1728     and
1729   }
1730   { t #1 #1 substring$
1731     duplicate$ "-" =
1732     swap$ duplicate$ "," =
1733     swap$ "+" =
1734     or or
1735     { #1 'multiresult := }
1736     { t #2 global.max$ substring$ 't := }
1737     if$
1738   }
1739   while$
1740   multiresult
1741 }
1742
1743 FUNCTION {format.pages}
1744 { pages empty$
1745   { "" }
1746   { pages multi.page.check
1747     { "pages" pages n.dashify tie.or.space.connect }
1748     { "page" pages tie.or.space.connect }
1749     if$
1750   }
1751   if$
1752 }
1753
1754 FUNCTION {format.vol.num.pages}
1755 { volume field.or.null
1756   number empty$
1757   'skip$
1758   { "\penalty0 (" number * ")" * *
1759     volume empty$
1760     { "there's a number but no volume in " cite$ * warning$ }
1761     'skip$
1762     if$
1763   }
1764   if$
1765   pages empty$
1766   'skip$
1767   { duplicate$ empty$
1768     { pop$ format.pages }
1769     { ":\penalty0 " * pages n.dashify * }
1770     if$
1771   }
1772   if$
1773 }
1774
1775 FUNCTION {format.chapter.pages}
1776 { chapter empty$
1777   'format.pages
1778   { type empty$
1779     { "chapter" }
1780     { type "1" change.case$ }
1781     if$

```

```

1782     chapter tie.or.space.connect
1783     pages empty$
1784     'skip$
1785     { ", " * format.pages * }
1786     if$
1787   }
1788   if$
1789 }
1790
1791 FUNCTION {format.in.ed.booktitle}
1792 { booktitle empty$
1793   { "" }
1794   { editor empty$
1795     { "In " booktitle emphasize * }
1796     { "In " format.editors * ", " * booktitle emphasize * }
1797     if$
1798   }
1799   if$
1800 }
1801
1802 FUNCTION {empty.misc.check}
1803 { author empty$ title empty$ howpublished empty$
1804   month empty$ year empty$ note empty$
1805   and and and and and
1806   key empty$ not and
1807   { "all relevant fields are empty in " cite$ * warning$ }
1808   'skip$
1809   if$
1810 }
1811
1812 FUNCTION {format.thesis.type}
1813 { type empty$
1814   'skip$
1815   { pop$
1816     type "t" change.case$
1817   }
1818   if$
1819 }
1820
1821 FUNCTION {format.tr.number}
1822 { type empty$
1823   { "Technical Report" }
1824   'type
1825   if$
1826   number empty$
1827   { "t" change.case$ }
1828   { number tie.or.space.connect }
1829   if$
1830 }
1831
1832 FUNCTION {format.article.crossref}
1833 { key empty$
1834   { journal empty$
1835     { "need key or journal for " cite$ * " to crossref " * crossref *

```



```

1836         warning$
1837         ""
1838     }
1839     { "In {\em " journal * "\/}" * }
1840     if$
1841     }
1842     { "In " key * }
1843     if$
1844     " \cite{" * crossref * "}" *
1845 }
1846
1847 FUNCTION {format.book.crossref}
1848 { volume empty$
1849     { "empty volume in " cite$ * "'s crossref of " * crossref * warning$
1850       "In "
1851     }
1852     { "Volume" volume tie.or.space.connect
1853       " of " *
1854     }
1855     if$
1856     editor empty$
1857     editor field.or.null author field.or.null =
1858     or
1859     { key empty$
1860       { series empty$
1861         { "need editor, key, or series for " cite$ * " to crossref " *
1862           crossref * warning$
1863           "" *
1864         }
1865         { "{\em " * series * "\/}" * }
1866       }
1867       if$
1868       { key * }
1869       if$
1870     }
1871     'skip$
1872     if$
1873     ", \citet{" * crossref * "}" *
1874 }
1875
1876 FUNCTION {format.incoll.inproc.crossref}
1877 { editor empty$
1878     editor field.or.null author field.or.null =
1879     or
1880     { key empty$
1881       { booktitle empty$
1882         { "need editor, key, or booktitle for " cite$ * " to crossref " *
1883           crossref * warning$
1884           ""
1885         }
1886         { "In {\em " booktitle * "\/}" * }
1887       }
1888       if$
1889       { "In " key * }

```

```

1890     if$
1891   }
1892   { "In " }
1893   if$
1894   " \citet{" * crossref * "}" *
1895 }
1896
1897 FUNCTION {article}
1898 { output.bibitem
1899   format.authors "author" output.check
1900   author format.key output
1901   new.block
1902   format.title "title" output.check
1903   new.block
1904   crossref missing$
1905     { journal emphasize "journal" output.check
1906       format.vol.num.pages output
1907       format.date "year" output.check
1908     }
1909     { format.article.crossref output.nonnull
1910       format.pages output
1911     }
1912   if$
1913   format.issn output
1914   format.url output
1915   new.block
1916   note output
1917   fin.entry
1918 }
1919
1920 FUNCTION {book}
1921 { output.bibitem
1922   author empty$
1923     { format.editors "author and editor" output.check
1924       editor format.key output
1925     }
1926     { format.authors output.nonnull
1927       crossref missing$
1928         { "author and editor" editor either.or.check }
1929       'skip$
1930     }
1931   if$
1932   if$
1933   new.block
1934   format.btitle "title" output.check
1935   crossref missing$
1936     { format.bvolume output
1937       new.block
1938       format.number.series output
1939       new.sentence
1940       publisher "publisher" output.check
1941       address output
1942     }
1943   { new.block

```

```

1944     format.book.crossref output.nonnull
1945 }
1946 if$
1947   format.edition output
1948   format.date "year" output.check
1949   format.isbn output
1950   format.url output
1951   new.block
1952   note output
1953   fin.entry
1954 }
1955
1956 FUNCTION {booklet}
1957 { output.bibitem
1958   format.authors output
1959   author format.key output
1960   new.block
1961   format.title "title" output.check
1962   howpublished address new.block.checkb
1963   howpublished output
1964   address output
1965   format.date output
1966   format.isbn output
1967   format.url output
1968   new.block
1969   note output
1970   fin.entry
1971 }
1972
1973 FUNCTION {inbook}
1974 { output.bibitem
1975   author empty$
1976   { format.editors "author and editor" output.check
1977     editor format.key output
1978   }
1979   { format.authors output.nonnull
1980     crossref missing$
1981     { "author and editor" editor either.or.check }
1982     'skip$
1983   if$
1984   }
1985   if$
1986   new.block
1987   format.btitle "title" output.check
1988   crossref missing$
1989   { format.bvolume output
1990     format.chapter.pages "chapter and pages" output.check
1991     new.block
1992     format.number.series output
1993     new.sentence
1994     publisher "publisher" output.check
1995     address output
1996   }
1997   { format.chapter.pages "chapter and pages" output.check

```

```

1998     new.block
1999     format.book.crossref output.nonnull
2000 }
2001 if$
2002 format.edition output
2003 format.date "year" output.check
2004 format.isbn output
2005 format.url output
2006 new.block
2007 note output
2008 fin.entry
2009 }
2010
2011 FUNCTION {incollection}
2012 { output.bibitem
2013   format.authors "author" output.check
2014   author format.key output
2015   new.block
2016   format.title "title" output.check
2017   new.block
2018   crossref missing$
2019   { format.in.ed.booktitle "booktitle" output.check
2020     format.bvolume output
2021     format.number.series output
2022     format.chapter.pages output
2023     new.sentence
2024     publisher "publisher" output.check
2025     address output
2026     format.edition output
2027     format.date "year" output.check
2028   }
2029   { format.incoll.inproc.crossref output.nonnull
2030     format.chapter.pages output
2031   }
2032   if$
2033   format.isbn output
2034   format.url output
2035   new.block
2036   note output
2037   fin.entry
2038 }
2039
2040 FUNCTION {inproceedings}
2041 { output.bibitem
2042   format.authors "author" output.check
2043   author format.key output
2044   new.block
2045   format.title "title" output.check
2046   new.block
2047   crossref missing$
2048   { format.in.ed.booktitle "booktitle" output.check
2049     format.bvolume output
2050     format.number.series output
2051     format.pages output

```

```

2052     address empty$
2053     { organization publisher new.sentence.checkb
2054       organization output
2055       publisher output
2056       format.date "year" output.check
2057     }
2058     { address output.nonnull
2059       format.date "year" output.check
2060       new.sentence
2061       organization output
2062       publisher output
2063     }
2064     if$
2065   }
2066   { format.incoll.inproc.crossref output.nonnull
2067     format.pages output
2068   }
2069   if$
2070   format.isbn output
2071   format.url output
2072   new.block
2073   note output
2074   fin.entry
2075 }
2076
2077 FUNCTION {conference} { inproceedings }
2078
2079 FUNCTION {manual}
2080 { output.bibitem
2081   format.authors output
2082   author format.key output
2083   new.block
2084   format.btitle "title" output.check
2085   organization address new.block.checkb
2086   organization output
2087   address output
2088   format.edition output
2089   format.date output
2090   format.url output
2091   new.block
2092   note output
2093   fin.entry
2094 }
2095
2096 FUNCTION {mastersthesis}
2097 { output.bibitem
2098   format.authors "author" output.check
2099   author format.key output
2100   new.block
2101   format.title "title" output.check
2102   new.block
2103   "Master's thesis" format.thesis.type output.nonnull
2104   school "school" output.check
2105   address output

```

```

2106 format.date "year" output.check
2107 format.url output
2108 new.block
2109 note output
2110 fin.entry
2111 }
2112
2113 FUNCTION {misc}
2114 { output.bibitem
2115   format.authors output
2116   author format.key output
2117   title howpublished new.block.checkb
2118   format.title output
2119   howpublished new.block.checka
2120   howpublished output
2121   format.date output
2122   format.issn output
2123   format.url output
2124   new.block
2125   note output
2126   fin.entry
2127   empty.misc.check
2128 }
2129
2130 FUNCTION {phdthesis}
2131 { output.bibitem
2132   format.authors "author" output.check
2133   author format.key output
2134   new.block
2135   format.btitle "title" output.check
2136   new.block
2137   "PhD thesis" format.thesis.type output.nonnull
2138   school "school" output.check
2139   address output
2140   format.date "year" output.check
2141   format.url output
2142   new.block
2143   note output
2144   fin.entry
2145 }
2146
2147 FUNCTION {proceedings}
2148 { output.bibitem
2149   format.editors output
2150   editor format.key output
2151   new.block
2152   format.btitle "title" output.check
2153   format.bvolume output
2154   format.number.series output
2155   address output
2156   format.date "year" output.check
2157   new.sentence
2158   organization output
2159   publisher output

```

```

2160 format.isbn output
2161 format.url output
2162 new.block
2163 note output
2164 fin.entry
2165 }
2166
2167 FUNCTION {techreport}
2168 { output.bibitem
2169   format.authors "author" output.check
2170   author format.key output
2171   new.block
2172   format.title "title" output.check
2173   new.block
2174   format.tr.number output.nonnull
2175   institution "institution" output.check
2176   address output
2177   format.date "year" output.check
2178   format.url output
2179   new.block
2180   note output
2181   fin.entry
2182 }
2183
2184 FUNCTION {unpublished}
2185 { output.bibitem
2186   format.authors "author" output.check
2187   author format.key output
2188   new.block
2189   format.title "title" output.check
2190   format.url output
2191   new.block
2192   note "note" output.check
2193   format.date output
2194   fin.entry
2195 }
2196
2197 FUNCTION {default.type} { misc }
2198
2199
2200 MACRO {jan} {"January"}
2201
2202 MACRO {feb} {"February"}
2203
2204 MACRO {mar} {"March"}
2205
2206 MACRO {apr} {"April"}
2207
2208 MACRO {may} {"May"}
2209
2210 MACRO {jun} {"June"}
2211
2212 MACRO {jul} {"July"}
2213

```

2214 MACRO {aug} {"August"}
 2215
 2216 MACRO {sep} {"September"}
 2217
 2218 MACRO {oct} {"October"}
 2219
 2220 MACRO {nov} {"November"}
 2221
 2222 MACRO {dec} {"December"}
 2223
 2224
 2225
 2226 MACRO {acmcs} {"ACM Computing Surveys"}
 2227
 2228 MACRO {acta} {"Acta Informatica"}
 2229
 2230 MACRO {cacm} {"Communications of the ACM"}
 2231
 2232 MACRO {ibmjrd} {"IBM Journal of Research and Development"}
 2233
 2234 MACRO {ibmsj} {"IBM Systems Journal"}
 2235
 2236 MACRO {ieeese} {"IEEE Transactions on Software Engineering"}
 2237
 2238 MACRO {ieeetc} {"IEEE Transactions on Computers"}
 2239
 2240 MACRO {ieeetcad}
 2241 {"IEEE Transactions on Computer-Aided Design of Integrated Circuits"}
 2242
 2243 MACRO {ipl} {"Information Processing Letters"}
 2244
 2245 MACRO {jacm} {"Journal of the ACM"}
 2246
 2247 MACRO {jcss} {"Journal of Computer and System Sciences"}
 2248
 2249 MACRO {scp} {"Science of Computer Programming"}
 2250
 2251 MACRO {sicomp} {"SIAM Journal on Computing"}
 2252
 2253 MACRO {tocs} {"ACM Transactions on Computer Systems"}
 2254
 2255 MACRO {tods} {"ACM Transactions on Database Systems"}
 2256
 2257 MACRO {tog} {"ACM Transactions on Graphics"}
 2258
 2259 MACRO {toms} {"ACM Transactions on Mathematical Software"}
 2260
 2261 MACRO {toois} {"ACM Transactions on Office Information Systems"}
 2262
 2263 MACRO {toplas} {"ACM Transactions on Programming Languages and Systems"}
 2264
 2265 MACRO {tcs} {"Theoretical Computer Science"}
 2266
 2267


```

2268 READ
2269
2270 FUNCTION {sortify}
2271 { purify$
2272   "l" change.case$
2273 }
2274
2275 INTEGERS { len }
2276
2277 FUNCTION {chop.word}
2278 { 's :=
2279   'len :=
2280   s #1 len substring$ =
2281     { s len #1 + global.max$ substring$ }
2282     's
2283   if$
2284 }
2285
2286 FUNCTION {format.lab.names}
2287 { 's :=
2288   s #1 "{vv~}{ll}" format.name$
2289   s num.names$ duplicate$
2290   #2 >
2291     { pop$ " et~al." * }
2292     { #2 <
2293       'skip$
2294       { s #2 "{ff }{vv }{ll}{ jj}" format.name$ "others" =
2295         { " et~al." * }
2296         { " and " * s #2 "{vv~}{ll}" format.name$ * }
2297       if$
2298     }
2299     if$
2300   }
2301   if$
2302 }
2303
2304 FUNCTION {author.key.label}
2305 { author empty$
2306   { key empty$
2307     { cite$ #1 #3 substring$ }
2308     'key
2309     if$
2310   }
2311   { author format.lab.names }
2312   if$
2313 }
2314
2315 FUNCTION {author.editor.key.label}
2316 { author empty$
2317   { editor empty$
2318     { key empty$
2319       { cite$ #1 #3 substring$ }
2320       'key
2321       if$

```

```

2322     }
2323     { editor format.lab.names }
2324     if$
2325   }
2326   { author format.lab.names }
2327   if$
2328 }
2329
2330 FUNCTION {author.key.organization.label}
2331 { author empty$
2332   { key empty$
2333     { organization empty$
2334       { cite$ #1 #3 substring$ }
2335       { "The " #4 organization chop.word #3 text.prefix$ }
2336       if$
2337     }
2338     'key
2339     if$
2340   }
2341   { author format.lab.names }
2342   if$
2343 }
2344
2345 FUNCTION {editor.key.organization.label}
2346 { editor empty$
2347   { key empty$
2348     { organization empty$
2349       { cite$ #1 #3 substring$ }
2350       { "The " #4 organization chop.word #3 text.prefix$ }
2351       if$
2352     }
2353     'key
2354     if$
2355   }
2356   { editor format.lab.names }
2357   if$
2358 }
2359
2360 FUNCTION {calc.short.authors}
2361 { type$ "book" =
2362   type$ "inbook" =
2363   or
2364   'author.editor.key.label
2365   { type$ "proceedings" =
2366     'editor.key.organization.label
2367     { type$ "manual" =
2368       'author.key.organization.label
2369       'author.key.label
2370       if$
2371     }
2372     if$
2373   }
2374   if$
2375   'short.list :=

```

```

2376 }
2377
2378 FUNCTION {calc.label}
2379 { calc.short.authors
2380   short.list
2381   "("
2382   *
2383   year duplicate$ empty$
2384   short.list key field.or.null = or
2385     { pop$ "" }
2386     'skip$
2387   if$
2388   *
2389   'label :=
2390 }
2391
2392 FUNCTION {sort.format.names}
2393 { 's :=
2394   #1 'nameptr :=
2395   ""
2396   s num.names$ 'numnames :=
2397   numnames 'namesleft :=
2398     { namesleft #0 > }
2399     { nameptr #1 >
2400       { " " * }
2401       'skip$
2402       if$
2403       s nameptr "{vv{ } }{ll{ }}{ ff{ }}{ jj{ }}" format.name$ 't :=
2404       nameptr numnames = t "others" = and
2405         { "et al" * }
2406         { t sortify * }
2407       if$
2408       nameptr #1 + 'nameptr :=
2409       namesleft #1 - 'namesleft :=
2410     }
2411   while$
2412 }
2413
2414 FUNCTION {sort.format.title}
2415 { 't :=
2416   "A " #2
2417   "An " #3
2418   "The " #4 t chop.word
2419   chop.word
2420   chop.word
2421   sortify
2422   #1 global.max$ substring$
2423 }
2424
2425 FUNCTION {author.sort}
2426 { author empty$
2427   { key empty$
2428     { "to sort, need author or key in " cite$ * warning$
2429     ""

```

```

2430     }
2431     { key sortify }
2432     if$
2433 }
2434 { author sort.format.names }
2435 if$
2436 }
2437
2438 FUNCTION {author.editor.sort}
2439 { author empty$
2440   { editor empty$
2441     { key empty$
2442       { "to sort, need author, editor, or key in " cite$ * warning$
2443         ""
2444       }
2445       { key sortify }
2446     } if$
2447   }
2448   { editor sort.format.names }
2449 } if$
2450 }
2451 { author sort.format.names }
2452 if$
2453 }
2454
2455 FUNCTION {author.organization.sort}
2456 { author empty$
2457   { organization empty$
2458     { key empty$
2459       { "to sort, need author, organization, or key in " cite$ * warning$
2460         ""
2461       }
2462       { key sortify }
2463     } if$
2464   }
2465   { "The " #4 organization chop.word sortify }
2466 } if$
2467 }
2468 { author sort.format.names }
2469 if$
2470 }
2471
2472 FUNCTION {editor.organization.sort}
2473 { editor empty$
2474   { organization empty$
2475     { key empty$
2476       { "to sort, need editor, organization, or key in " cite$ * warning$
2477         ""
2478       }
2479       { key sortify }
2480     } if$
2481   }
2482   { "The " #4 organization chop.word sortify }
2483 } if$

```

```

2484     }
2485     { editor sort.format.names }
2486     if$
2487 }
2488
2489 FUNCTION {presort}
2490 { calc.label
2491   label sortify
2492   "   "
2493   *
2494   type$ "book" =
2495   type$ "inbook" =
2496   or
2497   'author.editor.sort
2498   { type$ "proceedings" =
2499     'editor.organization.sort
2500     { type$ "manual" =
2501       'author.organization.sort
2502       'author.sort
2503       if$
2504     }
2505     if$
2506   }
2507   if$
2508   "   "
2509   *
2510   year field.or.null sortify
2511   *
2512   "   "
2513   *
2514   title field.or.null
2515   sort.format.title
2516   *
2517   #1 entry.max$ substring$
2518   'sort.label :=
2519   sort.label *
2520   #1 entry.max$ substring$
2521   'sort.key$ :=
2522 }
2523
2524 ITERATE {presort}
2525
2526 SORT
2527
2528 STRINGS { longest.label last.label next.extra }
2529
2530 INTEGERS { longest.label.width last.extra.num number.label }
2531
2532 FUNCTION {initialize.longest.label}
2533 { "" 'longest.label :=
2534   #0 int.to.chr$ 'last.label :=
2535   "" 'next.extra :=
2536   #0 'longest.label.width :=
2537   #0 'last.extra.num :=

```

```

2538 #0 'number.label :=
2539 }
2540
2541 FUNCTION {forward.pass}
2542 { last.label label =
2543   { last.extra.num #1 + 'last.extra.num :=
2544     last.extra.num int.to.chr$ 'extra.label :=
2545   }
2546   { "a" chr.to.int$ 'last.extra.num :=
2547     "" 'extra.label :=
2548     label 'last.label :=
2549   }
2550   if$
2551   number.label #1 + 'number.label :=
2552 }
2553
2554 FUNCTION {reverse.pass}
2555 { next.extra "b" =
2556   { "a" 'extra.label := }
2557   'skip$
2558   if$
2559   extra.label 'next.extra :=
2560   extra.label
2561   duplicate$ empty$
2562   'skip$
2563   { "{\natexlab{ swap$ * }}" * }
2564   if$
2565   'extra.label :=
2566   label extra.label * 'label :=
2567 }
2568
2569 EXECUTE {initialize.longest.label}
2570
2571 ITERATE {forward.pass}
2572
2573 REVERSE {reverse.pass}
2574
2575 FUNCTION {bib.sort.order}
2576 { sort.label 'sort.key$ :=
2577 }
2578
2579 ITERATE {bib.sort.order}
2580
2581 SORT
2582
2583 FUNCTION {begin.bib}
2584 { preamble$ empty$
2585   'skip$
2586   { preamble$ write$ newline$ }
2587   if$
2588   "\begin{thebibliography}{ number.label int.to.str$ * }" *
2589   write$ newline$
2590   "\expandafter\ifx\csname natexlab\endcsname\relax\def\natexlab#1{#1}\fi"
2591   write$ newline$

```

```

2592 "\expandafter\ifx\csname url\endcsname\relax" write$ newline$
2593 " \def\url#1{{\tt #1}}\fi" write$ newline$
2594 }
2595
2596 EXECUTE {begin.bib}
2597
2598 EXECUTE {init.state.consts}
2599
2600 ITERATE {call.type$}
2601
2602 FUNCTION {end.bib}
2603 { newline$
2604 "\end{thebibliography}" write$ newline$
2605 }
2606
2607 EXECUTE {end.bib}
2608 </bst>

```

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