

Introduction to L^AT_EX

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what is LaTeX?

- it's a typesetting markup language
- it's a set of macros that use TeX to format documents
- it's a powerful set of formatting commands that includes support for mathematical formulae, tables, sectioning, indexing, bibliographic referencing and citation, etc.

what is LaTeX not?

- it's not a stretchy natural rubber product
- it's not a word processor
- it's definitely not WYSIWYG
- it's not for unstructured documents

history

- TeX is a programming language for specifying typesetting
 - designed by Donald Knuth
 - first release in 1978
mostly finished by 1989
 - really complicated, low-level, and picky!
 - rhymes with Blecchh...

history

- LaTeX is a set of macros that builds upon TeX
- started as a set of macros by Leslie Lamport in the early 1980's ("Lamport's TeX")
- infinitely easier to deal with than "plain TeX"
- pronounced "lah-tekh" or "lay-tekh"

how does it work?

- write a plain ASCII text file
- add LaTeX markup commands in the text
- **compile** that file into a professional-looking document layout
 - let LaTeX make a myriad of detailed typesetting and page-layout decisions...

why LaTeX?

- separates the content of the document from the format
- allows very high-quality typesetting during the compilation process
- allows consistent look and feel for a family of documents
- great support for bibliographic databases / citations

(very) basic document structure

% comments start from %, go to end of the line

% commands all start with “\“

\documentclass{...}

% what sort of doc?

\usepackage{...}

% any special add-ons?

\begin{document}

% setup done, start doc

text of your document

\end{document}

% end of the document

```
% Perhaps the simplest LATEX document possible...
\documentclass{article}
\begin{document}
```

Hello world!

```
\end{document}
```

```
% Perhaps the simplest LATEX document possible...
\documentclass{article}
\begin{document}
```

Hello world!

```
\end{document}
```

switch to demo....

LaTeX IDEs

- TeXShop is available for Macs
 - <http://pages.uoregon.edu/koch/texshop/texshop.html>
- TeXmaker, TeXstudio, TeXworks, ... (local IDE)
- Overleaf, ShareLaTeX, Authorea, ... (web-based)
- TeXlipse (if you really like Eclipse)

more details

- **special characters:** # \$ % ^ & _ { } ~ \
 - these will not print as regular characters
- you can escape them with a backslash
(except for backslash!)
 - \# \\$ % ^{} & _ { } ~{}
- \textbackslash

more details

- Commands start with a \

\command [optional-parameter] {parameter}

You can *\text{\{lean\}}* on me!

You can *lean* on me!

font styles

- Generally two techniques

\emph{ emphasized }

\textsf{ sans-serif }

\textit{ italic text }

\textbf{ boldface }

{\em emphasized }

{\sffamily sans-serif }

{\itshape italic text }

{\bfseries boldface}

\textnormal{}, \textrm{}, \texttt{}, \textsl{}, \textsc{},

...

font sizes

- commands hold until changed
so you might want a new scope

{\small this is very small text}

\tiny, \scriptsize, \footnotesize, \small, \normalsize,
\large, \Large, \LARGE, \huge, \Huge

font choices

- surprisingly complex... TeX/LaTeX are old enough that they predate modern conventions...

% change serif to Times, sans-serif to Helvetica,
% monospaced to Courier

\usepackage{times}

other choices: <default>, lmodern, mathptmx,
palatino, bookman, newcent, charter, chancery,
avant, ...

font choices

- surprisingly complex... TeX/LaTeX are old enough that they predate modern conventions...

% change to a better font! (Some people have
% **strong** opinions about fonts!)

```
\usepackage{mathptmx}
```

other choices: <default>, **Imodern**, **mathptmx**, palatino, bookman, newcent, charter, chancery, avant, ...

font choices

- LaTeX style files will usually choose fonts for you
- best to stick with the defaults, or the simple “usepackage” options for now
- or go somewhere like
<http://www.tug.dk/FontCatalogue/>
for examples

sectioning commands

- LaTeX is all about structure...

\chapter{}, \section{}, \subsection{},
\subsubsection{}, \paragraph{}

```
\documentclass[11pt]{article} % resize the overall font
```

```
\title{Very Small Document} % define the title and author  
\author{Erik Brunvand}
```

```
\begin{document} % begin the document  
\maketitle % generate the title
```

```
\section{Introduction}
```

This is the start of the article.

```
\section{Second Section}
```

Here's some additional text in another section

```
\subsection{Really?}
```

I don't think I really need a sub-section yet, but just for fun

```
\ldots{}
```

```
\end{document}
```

This text will not show up in the output.

options

\documentclass[options]{types}

options: 10pt, 11pt, 12pt, a4paper, letterpaper,
twocolumn, twoside, landscape...

native types: article, report, book, proc

provided types: IEEEtran, ieeeconf, sig-alternate,
acmsiggraph, nsfprop, egpubl, vgtc, jpaper...

other environments

```
\begin{itemize}
\item This is the first item
    \begin{itemize}
        \item Here's a sub-bullet
        \item And another sub-bullet point
    \end{itemize}
\item Here's another item
\item And another \ldots{}
\end{itemize}
```

other environments

```
\begin{enumerate}
\item This is the first item
    \begin{enumerate}
        \item Here's a sub-bullet
        \item And another sub-bullet point
    \end{enumerate}
\item Here's another item
\item And another \ldots{}
\end{enumerate}
```

other environments

```
\begin{description}
\item[First:] This is the first item
  \begin{enumerate}
    \item Here's a sub-bullet
    \item And another sub-bullet point
  \end{enumerate}
\item[Another Point:] Here's another item
\item[Still Another:] And another \ldots
\end{description}
```

figures

%Latex needs help including images...

```
\usepackage{graphicx}
```

```
\begin{document}
```

```
\begin{figure}
    \centering
    \includegraphics[width=4.2in]{images/AnImage}
    \caption{Images can be jpg, png, pdf, eps (eps may
            require the epstopdf package)}
    \label{figure-handle}
\end{figure}
```

In the text you can refer to this as Figure~\ref{figure-handle}.

figure variations

- `\begin{figure}[htbp] % here, top, bottom, page of floats`
- `\begin{figure*} % span the page even in two-column mode`
- `\includegraphics[width=0.8\columnwidth]{...}`
 - `\textwidth` is the (constant) width of the total text block
 - `\columnwidth` is the (constant) width of a single column of text
 - (which is the same as `\textwidth` for a single column document)
 - `\ linewidth` is a variable that represents the current size of the line of text, whether inside a column or a minipage or a list

tables

- actually “tabular” - a “table” is just like a “figure” but numbered using a different counter...
- use the “tabular” environment to make tables of data

```
\begin{tabular}{column-alignment}  
data & data & data \\  
\end{tabular}
```

tabular

```
\begin{tabular}{ c c c }
cell1 & cell2 & cell3 \\
cell4 & cell5 & cell6 \\
cell7 & cell8 & cell9
\end{tabular}
```

tabular

```
\begin{tabular}{ c c c }
cell1 & cell2 & cell3 \\
cell4 & cell5 & cell6 \\
cell7 & cell8 & cell9
\end{tabular}
```

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

tabular

```
\begin{tabular}{ | c | c | c | }
```

```
\hline \hline
```

```
cell1 & cell2 & cell3 \\ \hline
```

```
cell4 & cell5 & cell6 \\
```

```
cell7 & cell8 & cell9
```

```
\hline \hline
```

```
\end{tabular}
```

tabular

```
\begin{tabular}{ | c | c | c |}
```

```
\hline \hline
```

```
cell1 & cell2 & cell3 \\ \hline
```

```
cell4 & cell5 & cell6 \\
```

```
cell7 & cell8 & cell9
```

```
\hline \hline
```

```
\end{tabular}
```

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

tabular

```
\begin{tabular}{|||l||r|}  
 \hline \hline  
 {\em type} & \multicolumn{2}{c}{\em style} \\ \hline  
 smart & red & short \\  
 rather silly & puce & tall \\  
 \hline \hline  
 \end{tabular}
```

tabular

```
\begin{tabular}{|||l||r|}  
 \hline \hline  
 {\em type} & \multicolumn{2}{c}{\em style} \\ \hline  
 smart & red & short \\  
 rather silly & puce & tall \\  
 \hline \hline  
 \end{tabular}
```

<i>type</i>	<i>style</i>	
smart	red	short
rather silly	puce	tall

tabular

```
\begin{tabular}{r|l|rrrrrrr}
& & Crytek & Dragon & Dragon Box & Vegetation & Hairball & Dragon & San Miguel \\
& & Sponza & & & & & Sponza & \\
\hline & & [-0.1in]

\multirow{7}{*}{\rotatebox{90}{\textbf{STRaTA}}}
& Render Time (ms / Frame) & \textbf{39.0} & \textit{23.12} & \textit{91.27} & \textbf{48.23} & \textit{36.2} & \textit{70.98} & \textit{125.51} \\
& DRAM Energy (J) & \textbf{2.26} & \textit{2.34} & \textit{10.17} & \textbf{5.38} & \textit{4.61} & \textit{5.32} & \textit{15.08} \\
& Row Buffer Hit Rate, Reads (\%) & \textbf{85.1} & \textit{81.1} & \textit{83.1} & \textit{77.8} & \textit{75.0} & \textit{79.0} & \textit{71.6} \\
& DRAM Power (W) & 58.06 & 101.13 & 111.47 & 111.52 & 127.44 & 74.93 & 120.19 \\
& Avg. Bandwidth (GB/s) & 101.95 & 219.33 & 266.65 & 229.59 & 254.53 & 137.48 & 219.34 \\
& Cache Lines Transferred (M) & 62.14 & 79.2 & 380.1 & 173 & 144 & 152.5 & 430.1 \\
\hline & & [-0.1in]

\multirow{11}{*}{\rotatebox{90}{\textbf{Dual Streaming}}}
& Render Time (ms / Frame) & \textit{45.48} & \textbf{18.64} & \textbf{66.1} & \textit{69.67} & \textit{64.86} & \textbf{41.06} & \textbf{80.6} \\
& DRAM Energy (J) & \textit{4.54} & \textbf{1.17} & \textbf{4.60} & \textit{4.45} & \textit{4.61} & \textit{4.52} & \textit{8.12} \\
& Row Buffer Hit Rate, Reads (\%) & \textit{78.2} & \textit{89.3} & \textit{74.7} & \textit{85.8} & \textit{83.6} & \textit{84.1} & \textit{84.2} \\
& DRAM Power (W) & 99.79 & 62.70 & 69.62 & 63.90 & 71.09 & 110.10 & 100.74 \\
& Avg. Bandwidth (GB/s) & 232.21 & 136.01 & 114.13 & 140.13 & 139.45 & 270.45 & 251.89 \\
& Cache Lines Transferred (M) & 165 & 39.6 & 117.9 & 152.5 & 141.3 & 173.5 & 317.2 \\
\cline{2-9}& & [-0.1in]
& Row Buffer Hit Rate, Writes (\%) & 86.3 & 85.8 & 77.0 & 89.3 & 80.2 & 81.7 & 85.4 \\
& Ray Stream Cache Lines (M) & 80.69 & 11.93 & 45.67 & 94.23 & 76.44 & 43.88 & 146.52 \\
& Scene Stream Cache Lines (M) & 2.25 & 7.56 & 8.0 & 8.19 & 19.18 & 54.83 & 71.91 \\
& Ray Duplication & 9.55 & 5.55 & 4.14 & 16.15 & 17.02 & 5.18 & 16.19 \\
\end{tabular}
```

tabular

	Crytek Sponza	Dragon	Dragon Box	Vegetation	Hairball	Dragon Sponza	San Miguel	
STRaTA	39.0	23.12	91.27	48.23	36.2	70.98	125.51	
	2.26	2.34	10.17	5.38	4.61	5.32	15.08	
	85.1	81.1	83.1	77.8	75.0	79.0	71.6	
	58.06	101.13	111.47	111.52	127.44	74.93	120.19	
	101.95	219.33	266.65	229.59	254.53	137.48	219.34	
	62.14	79.2	380.1	173	144	152.5	430.1	
Dual Streaming	45.48	18.64	66.1	69.67	64.86	41.06	80.6	
	4.54	1.17	4.60	4.45	4.61	4.52	8.12	
	78.2	89.3	74.7	85.8	83.6	84.1	84.2	
	99.79	62.70	69.62	63.90	71.09	110.10	100.74	
	232.21	136.01	114.13	140.13	139.45	270.45	251.89	
	165	39.6	117.9	152.5	141.3	173.5	317.2	
Ray Tracing	Row Buffer Hit Rate, Writes (%)	86.3	85.8	77.0	89.3	80.2	81.7	85.4
	Ray Stream Cache Lines (M)	80.69	11.93	45.67	94.23	76.44	43.88	146.52
	Scene Stream Cache Lines (M)	2.25	7.56	8.0	8.19	19.18	54.83	71.91
	Ray Duplication	9.55	5.55	4.14	16.15	17.02	5.18	16.19

equations

- equations are formatted in “math mode”
- $\backslash(\dots \text{math mode} \dots)\backslash$
- $\$ \dots \text{math mode} \dots \$$
- $\backslash\begin{math} \dots \text{math mode} \dots \backslash\end{math}$
- $\backslash[\dots \text{“display math” mode} \dots]\backslash$

equations

- subscript $A_{\{x\}}$
- superscript $B^{\wedge\{x\}}$
- fractions / or $\frac{x}{y}$
- \sqrt{x} , $\sqrt[3]{x}$ $\$A_{\{x\}}\$$ results in A_x
 $\$B^{\wedge\{x\}}\$$ results in B^x
 $\$\frac{x}{y}\$$ results in $\frac{x}{y}$
 $\$\sqrt{x}\$$ results in \sqrt{x}
 $\$\sqrt[3]{x}\$$ results in $\sqrt[3]{x}$

quick aside: verbatim

- Sometimes you just want a bunch of text exactly as you type it, without worrying about LaTeX commands
- `\begin{verbatim}`
... don't format me ...
`\end{verbatim}`
- `\verb+` ... don't format me ... +
% you can use any pair of matching chars to
% delimit the verbatim... I used +

simple math

$\$x^{2y}\$$

$\$x^{y^2}\$$

$\$x_2\$$

$\$x^{y_1}\$$

$\$x_1^y\$$

$\$\\sqrt{x+y}\$$

$\$\\sqrt[3]{10}\$$

$\backslash [x = \\frac{y + \\sqrt{z}}{2} \{y^2 + 1\} \backslash]$

$\backslash [\\sum_{i=1}^n x_i = \\int_0^1 f \backslash]$

$\backslash (\\sum_{i=1}^n x_i = \\int_0^1 f \backslash)$

Greek!

TABLE 4: Greek Letters

α	<code>\alpha</code>	θ	<code>\theta</code>	\circ	<code>\circ</code>	τ	<code>\tau</code>
β	<code>\beta</code>	ϑ	<code>\vartheta</code>	π	<code>\pi</code>	υ	<code>\upsilon</code>
γ	<code>\gamma</code>	ι	<code>\iota</code>	ϖ	<code>\varpi</code>	ϕ	<code>\phi</code>
δ	<code>\delta</code>	κ	<code>\kappa</code>	ρ	<code>\rho</code>	φ	<code>\varphi</code>
ϵ	<code>\epsilon</code>	λ	<code>\lambda</code>	ϱ	<code>\varrho</code>	χ	<code>\chi</code>
ε	<code>\varepsilon</code>	μ	<code>\mu</code>	σ	<code>\sigma</code>	ψ	<code>\psi</code>
ζ	<code>\zeta</code>	ν	<code>\nu</code>	ς	<code>\varsigma</code>	ω	<code>\omega</code>
η	<code>\eta</code>	ξ	<code>\xi</code>				
Γ	<code>\Gamma</code>	Λ	<code>\Lambda</code>	Σ	<code>\Sigma</code>	Ψ	<code>\Psi</code>
Δ	<code>\Delta</code>	Ξ	<code>\Xi</code>	Υ	<code>\Upsilon</code>	Ω	<code>\Omega</code>
Θ	<code>\Theta</code>	Π	<code>\Pi</code>	Φ	<code>\Phi</code>		

binary operations

TABLE 7: Binary Operation Symbols

\pm	<code>\pm</code>	\cap	<code>\cap</code>	\diamond	<code>\diamond</code>	\oplus	<code>\oplus</code>
\mp	<code>\mp</code>	\cup	<code>\cup</code>	\triangleleft	<code>\triangleleft</code>	\ominus	<code>\ominus</code>
\times	<code>\times</code>	\uplus	<code>\uplus</code>	\triangledown	<code>\triangledown</code>	\otimes	<code>\otimes</code>
\div	<code>\div</code>	\sqcap	<code>\sqcap</code>	\triangleleft	<code>\triangleleft</code>	\oslash	<code>\oslash</code>
$*$	<code>\ast</code>	\sqcup	<code>\sqcup</code>	\triangleright	<code>\triangleright</code>	\odot	<code>\odot</code>
\star	<code>\star</code>	\vee	<code>\vee</code>	\triangleleft^*	<code>\triangleleft^*</code>	\bigcirc	<code>\bigcirc</code>
\circ	<code>\circ</code>	\wedge	<code>\wedge</code>	\triangleright^*	<code>\triangleright^*</code>	\dagger	<code>\dagger</code>
\bullet	<code>\bullet</code>	\setminus	<code>\setminus</code>	$\triangleleft^{\text{unlhd}}$	<code>\triangleleft^{\text{unlhd}}</code>	\ddagger	<code>\ddagger</code>
\cdot	<code>\cdot</code>	\wr	<code>\wr</code>	$\triangleright^{\text{unrhd}}$	<code>\triangleright^{\text{unrhd}}</code>	\amalg	<code>\amalg</code>
$+$	<code>+</code>	$-$	<code>-</code>				

relations

TABLE 8: Relation Symbols

\wedge	<code>\leq</code>	\vee	<code>\geq</code>	\equiv	<code>\equiv</code>	\models	<code>\models</code>
\prec	<code>\prec</code>	\succ	<code>\succ</code>	\sim	<code>\sim</code>	\perp	<code>\perp</code>
\preceq	<code>\preceq</code>	\succcurlyeq	<code>\succcurlyeq</code>	\simeq	<code>\simeq</code>	\mid	<code>\mid</code>
\ll	<code>\ll</code>	\gg	<code>\gg</code>	\asymp	<code>\asymp</code>	\parallel	<code>\parallel</code>
\subset	<code>\subset</code>	\supset	<code>\supset</code>	\approx	<code>\approx</code>	\bowtie	<code>\bowtie</code>
\subseteq	<code>\subseteq</code>	\supseteq	<code>\supseteq</code>	\cong	<code>\cong</code>	\Join^*	<code>\Join^*</code>
\sqsubset	<code>\sqsubset</code>	\sqsupset	<code>\sqsupset</code>	\neq	<code>\neq</code>	\smile	<code>\smile</code>
\sqsubseteq	<code>\sqsubseteq</code>	\sqsupseteq	<code>\sqsupseteq</code>	\doteq	<code>\doteq</code>	\frown	<code>\frown</code>
\in	<code>\in</code>	\ni	<code>\ni</code>	\propto	<code>\propto</code>	$=$	<code>=</code>
\vdash	<code>\vdash</code>	\dashv	<code>\dashv</code>	$<$	<code><</code>	$>$	<code>></code>
:	:						

arrows

TABLE 10: Arrow Symbols

\leftarrow	<code>\leftarrow</code>	\longleftarrow	<code>\longleftarrow</code>	\uparrow	<code>\uparrow</code>
\Leftarrow	<code>\Leftarrow</code>	\Longleftarrow	<code>\Longleftarrow</code>	\Uparrow	<code>\Uparrow</code>
\rightarrow	<code>\rightarrow</code>	\longrightarrow	<code>\longrightarrow</code>	\downarrow	<code>\downarrow</code>
\Rightarrow	<code>\Rightarrow</code>	\Longrightarrow	<code>\Longrightarrow</code>	\Downarrow	<code>\Downarrow</code>
\leftrightarrow	<code>\leftrightarrow</code>	\longleftrightarrow	<code>\longleftrightarrow</code>	\updownarrow	<code>\updownarrow</code>
\Leftrightarrow	<code>\Leftrightarrow</code>	\Longleftrightarrow	<code>\Longleftrightarrow</code>	\Updownarrow	<code>\Updownarrow</code>
\mapsto	<code>\mapsto</code>	\longmapsto	<code>\longmapsto</code>	\nearrow	<code>\nearrow</code>
\hookleftarrow	<code>\hookleftarrow</code>	\hookrightarrow	<code>\hookrightarrow</code>	\searrow	<code>\searrow</code>
\leftharpoonup	<code>\leftharpoonup</code>	\rightharpoonup	<code>\rightharpoonup</code>	\swarrow	<code>\swarrow</code>
\leftharpoondown	<code>\leftharpoondown</code>	\rightharpoondown	<code>\rightharpoondown</code>	\nwarrow	<code>\nwarrow</code>
\rightleftharpoons	<code>\rightleftharpoons</code>	\leadsto^*	<code>\leadsto^*</code>		

misc

TABLE 11: Miscellaneous Symbols

...	\ldots	\cdots	\vdots	\ddots
\aleph	/	\prime	\forall	\infty
\hbar	\emptyset	\emptyset	\exists	\Box*
\imath	\nabla	\nabla	\neg	\Diamond*
\jmath	\surd	\surd	\flat	\triangle
\ell	\top	\top	\natural	\clubsuit
\wp	\bot	\bot	\sharp	\diamondsuit
\Re	\	\	\backslash	\heartsuit
\Im	\angle	\angle	\partial	\spadesuit
\mho*	.	.		

even more...

TABLE 12: Variable-sized Symbols

\sum	<code>\sum</code>	\bigcap	<code>\bigcap</code>	\bigodot	<code>\bigodot</code>
\prod	<code>\prod</code>	\bigcup	<code>\bigcup</code>	\bigotimes	<code>\bigotimes</code>
\coprod	<code>\coprod</code>	\bigsqcup	<code>\bigsqcup</code>	\bigoplus	<code>\bigoplus</code>
\int	<code>\int</code>	\bigvee	<code>\bigvee</code>	\biguplus	<code>\biguplus</code>
\oint	<code>\oint</code>	\bigwedge	<code>\bigwedge</code>		

TABLE 13: Log-like Symbols

<code>\arccos</code>	<code>\cos</code>	<code>\csc</code>	<code>\exp</code>	<code>\ker</code>	<code>\limsup</code>	<code>\min</code>	<code>\sinh</code>
<code>\arcsin</code>	<code>\cosh</code>	<code>\deg</code>	<code>\gcd</code>	<code>\lg</code>	<code>\ln</code>	<code>\Pr</code>	<code>\sup</code>
<code>\arctan</code>	<code>\cot</code>	<code>\det</code>	<code>\hom</code>	<code>\lim</code>	<code>\log</code>	<code>\sec</code>	<code>\tan</code>
<code>\arg</code>	<code>\coth</code>	<code>\dim</code>	<code>\inf</code>	<code>\liminf</code>	<code>\max</code>	<code>\sin</code>	<code>\tanh</code>

ridiculous example

```
\begin{equation}
\text{\textnormal{Re}}\{z\} = \frac{n\pi}{2} \frac{\theta + \psi}{2}
\left( \frac{\theta + \psi}{2} \right)^2 + \left( \frac{1}{2} \log \left| \frac{B}{A} \right| \right)^2
\end{equation}
```

ridiculous example

```
\begin{equation}
\text{\textnormal{Re}}\{z\} = \frac{n\pi}{2} \frac{\theta + \psi}{\left(\frac{\theta + \psi}{2}\right)^2 + \left(\frac{1}{2} \log \left|\frac{B}{A}\right|\right)^2}
\end{equation}
```

$$\Re z = \frac{n\pi \frac{\theta + \psi}{2}}{\left(\frac{\theta + \psi}{2}\right)^2 + \left(\frac{1}{2} \log \left|\frac{B}{A}\right|\right)^2}$$

bibliography

- two parts:
 1. the bibliographic database (another text file)
 2. the bibtex program (compiles the bibliography)

bibliography

In the text you can cite things with `\cite{citation-key}`. This will extract the citation from the database, generate a citation number, and put the reference into your references section.

```
\bibliographystyle{reference-type}  
\bibliography{/path/to/your/bib/file}
```

bib file format

```
@InProceedings{kopta-HPG13,  
    title = {An Energy and Bandwidth Efficient Ray Tracing Architecture},  
    author = {Daniel Kopta and Konstantin Shkurko and Josef Spjut and Erik Brunvand and Al Davis},  
    booktitle = {High-Performance Graphics (HPG 2013)},  
    year = 2013,  
    organization = {ACM}  
}
```

text outside of the entries is treated as a comment...

```
@Article{kopta-CGF14,  
    author = {D. Kopta and K. Shkurko and J. Spjut and E. Brunvand and A. Davis},  
    title = {Memory Considerations for Low Energy Ray Tracing},  
    journal = {Computer Graphics Forum},  
    volume = {34},  
    number = {1},  
    issn = {1467-8659},  
    url = {http://dx.doi.org/10.1111/cgf.12458},  
    doi = {10.1111/cgf.12458},  
    pages = {47--59},  
    year = {2015},  
}
```

bibliography

In the text you can cite things with
`\cite{kopta-HPG13,kopta-CGF14}`. This will extract
the citation from the database, generate a citation
number, and put the reference into your references
section.

```
\bibliographystyle{plain} % plain, alpha, acm, ieeetr  
\bibliography{/bib/example.bib} % file path
```

IEEE and ACM templates

- I have examples on Overleaf that you can check out
- IEEE: <https://www.overleaf.com/3040084ymrksb#/8391674/>
- ACM: <https://www.overleaf.com/4509628vncycd#/13543753/>