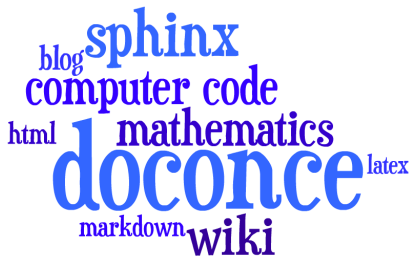


# Scientific Writing Anno 2013: The Doconce Way

Hans Petter Langtangen

May 5, 2013



A word cloud graphic featuring the word 'doconce' in large blue letters at the center. Surrounding it are other terms in blue and purple: 'sphinx' (top), 'computer code' (top-left), 'mathematics' (top-right), 'wiki' (bottom), 'markdown' (bottom-left), 'latex' (bottom-right), 'blog' (top-left), 'html' (top-left), and 'math' (top-right).

sphinx  
blog  
computer code  
html  
mathematics  
doconce  
latex  
markdown  
wiki

# Scientific writing needs to address many new media



The book will probably survive



UNIVERSITÉ DE NICE - SOPHIA ANTIPOLIS  
ÉCOLE DOCTORALE STIC  
SCIENCES ET TECHNOLOGIES DE L'INFORMATION  
ET DE LA COMMUNICATION

## THÈSE

pour obtenir le titre de

Docteur en Sciences

de l'Université de Nice - Sophia Antipolis

Mention : INFORMATIQUE

Présentée et soutenue par

Olivier COMMOWICK

## Création et utilisation d'atlas anatomiques numériques pour la radiothérapie

Thèse dirigée par Grégoire MALANDAIN

préparée à l'INRIA Sophia Antipolis, Projet ASCLEPIOS

Journal paper template • April 2012 • Vol. XXI, No. 1

## Long Titles Look More Impressive Than Short Ones

JONATHAN S. DOE\*

University of Technology, Delft  
frits@howtoTeX.com

### Abstract

*Lorem ipsum dolor sit amet, consectetur adipiscing elit. Curabitur magna lorem, tempor sed facilisis vel, porta et turpis. Sed et felis a massa dictum posuere. Aliquam hendrerit rhoncus ipsum sit amet placerat. Duis fringilla est eu arcu mollis faucibus non sit amet eros. Vestibulum risus nibh, dapibus vitae lacone eget, fringilla quis nisi. Proin consequat nibh sit amet mauris suscipit tincidunt. Sed rutrum, purus nec aliquam faucibus, quam libero venenatis nisi, ut tempor mi sapien vel diam. Pellentesque sagittis elit non risus malesuada accumsan. Morbi consequat urna et lacus hendrerit sodales. Proin at urna neque, ut dapibus urna. Curabitur venenatis molestie convallis. Vestibulum blandit vulputate risus, quis sodales sapien porttitor non.*

**L**orem ipsum dolor sit amet, consectetur adipiscing elit. Curabitur magna lorem, tempor sed facilisis vel, porta et turpis. Sed et felis a massa dictum posuere. Aliquam hendrerit rhoncus ipsum sit amet placerat. Duis fringilla est eu arcu mollis faucibus non sit amet eros. Vestibulum risus nibh, dapibus vitae lacone eget, fringilla quis nisi. Proin consequat nibh sit amet mauris suscipit tincidunt. Sed rutrum, purus nec aliquam faucibus, quam libero venenatis nisi, ut tempor mi sapien vel diam. Pellentesque sagittis elit non risus malesuada accumsan. Morbi consequat urna et lacus hendrerit sodales. Proin at urna neque, ut dapibus urna. Curabitur venenatis molestie convallis. Vestibulum blandit vulputate risus, quis sodales sapien porttitor non.

Suspendisse id urna vel risus venenatis ultrices ut vel odio. Donec aliquet est at magna tincidunt ut rutrum lacus cursus. Praesent ultrices aliquam erat quis scelerisque. Vestibulum interdum interdum augue, at placerat turpis tempus nec. Vestibulum feugiat, tellus ultrices tempor fermentum, ipsum dolor vestibulum eros, sed vulputate felis eros eget ipsum. Fusce ultrices dapibus turpis non

\*Template by howtoTeX.com

pretium. Suspendisse potenti. Integer porttitor, lorem ac mattis fermentum, metus neque scelerisque sapien, vel lobortis orci erat at sapien. Mauris convallis nisi feugiat velit porttitor mollis. Nunc cursus est cursus erat malesuada sit amet cursus magna malesuada. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Sed eget dolor mauris. Aenean lobortis nunc vel velit lobortis quis tincidunt libero porta. Nunc hendrerit aliquet porttitor.

### I. SECTION TITLE EXAMPLE

Maeenas sed ultrices felis. Sed imperdiet dictum arcu a egestas.

- Donec dolor arcu, rutrum id molestie in, viverra sed diam.
- Curabitur feugiat,
- turpis sed auctor facilisis,
- arcu eros accumsan lorem, at posuere mi diam sit amet tortor.
- Fusce fermentum, mi sit amet euismod rutrum,
- sem lorem molestie diam, iaculis aliquet sapien tortor non nisi.
- Pellentesque bibendum pretium aliquet.

# Scope

- Scope: documents with **much** *math* and *computer code*
- Key question: What tools should I use for writing?
- Default answer:  $\text{\LaTeX}$
- Recent popular alternative tools: HTML w/MathJax, Sphinx, Markdown, MediaWiki, IPython notebook

$\text{\LaTeX}$



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# Scientific writing needs to address many new media

Old days (1985-2005):

L<sup>A</sup>T<sub>E</sub>X for BW paper output, but now

- 1 BW books
- 2 Colorful PDF books (printed and screen)
- 3 Designed web pages
- 4 Wikis
- 5 Bloggs
- 6 Next new fancy format (iBook w/L<sup>A</sup>T<sub>E</sub>X?)



# Fundamental question

When I write some scientific material,

- a  $\text{\LaTeX}$  document,
- a blogg (HTML),
- some web pages (HTML),
- a Sphinx document,
- some Markdown files,

and later want to collect the pieces into a larger document, maybe some book, or one big web document, is that at all feasible?

Probably not, but I have a solution :-)

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is very rich; other tools support much less

- $\text{\LaTeX}$  inline math: works with all ( $\text{\LaTeX}$ , MathJax, Sphinx, Markdown, MediaWiki)
- $\text{\LaTeX}$  equation math:
  - **LaTeX**: `equation*`, `equation`, `align*`, `align` + `eqnarray`, `split`, `alignat`, ... (numerous!)
  - **MathJax**: `equation*`, `equation`, `align*`, `align`
  - **MediaWiki**: `equation*`, `equation`, `align*`, `align`
  - **Sphinx**: `equation*`, `equation`, `align*`
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- Movies: L<sup>A</sup>T<sub>E</sub>X (can run separately), just raw embedded HTML in others
- Floating computer code: L<sup>A</sup>T<sub>E</sub>X
- Fixed computer code: all
- Floating tables: L<sup>A</sup>T<sub>E</sub>X; inline tables: all
- Algorithms: L<sup>A</sup>T<sub>E</sub>X
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- Algorithms must be written up using basic elements like lists or paragraphs with headings.
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- Algorithms must be written up using basic elements like lists or paragraphs with headings.
- Recipes are often typeset as enumerated lists. For recipes with code or math blocks: drop the list (gives problems in some formats) and use paragraph (or subsection) headings with "Step 1.", "Step 2.", etc.

## Concerns II

- Footnotes must appear as part of the running text (e.g., sentences surrounded by parenthesis), since only a few formats support footnotes.
- Sphinx does not handle code blocks where the first line is indented.
- Multiple plots in the same figure: mount the plots to one image file and include this (`montage` for png, gif, jpeg; `pdftk`, `pdfnup`, and `pdfcrop` for PDF).
- Keys for items in the bibliography are made visible by Sphinx so "bibitems" a la  $\text{\LaTeX}$  must look sensible and consistent.
- If you need several equations *numbered* in an `align` environment, recall that Sphinx, Markdown, and MediaWiki cannot handle this, although they have  $\text{\LaTeX}$  math support.
- Markdown tolerates labels in equations but cannot refer to them.

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- Figures are floating in  $\text{\LaTeX}$ , but fixed in other tools, so place figures exactly where they are needed the first time.
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## Solution I: Use a format that translates to many

- Sphinx can do nice HTML,  $\text{\LaTeX}$ , epub, (almost) plain text, man pages, Gnome devhelp files, Qt help files, texinfo, JSON
- Markdown can do  $\text{\LaTeX}$ , HTML, MS Word, OpenOffice, XML, reStructuredText, epub, DocBook, ... but not Sphinx
- IPython notebook: can do  $\text{\LaTeX}$ , reStructuredText, HTML, PDF, Python script
- Sphinx and Markdown has some limited math support

## Solution II: Use Doconce

Doconce offers minimalistic typing, great flexibility wrt format, especially for scientific writing with much math and code.

- Can generate  $\text{\LaTeX}$ , HTML, Sphinx, Markdown, MediaWiki, Google wiki, Creole wiki, reST, plain text
- Made for large science books *and* small teaching modules
- Targets books, electronic PDF, PDF for phones, designed web pages, blogs
- Many special features (code snippets from files, embedded movies, admonitions, ...)
- Very effective for generating slides from ordinary text
- Applies Mako: Doconce text is a program
- Less tagged than  $\text{\LaTeX}$ , HTML, Sphinx

[http://hplgit.github.com/teamods/writing\\_reports/](http://hplgit.github.com/teamods/writing_reports/)

- LaTeX-based PDF for screen, for printing, for phone
- Plain HTML or with a template or another template or solarized
- Sphinx: agni, pyramid, classy, fenics, redcloud
- HTML for Google or Wordpress blogs
- MediaWiki (Wikipedia, Wikibooks, etc)
- Doconce source code and tutorial



# A tour of Doconce

# Doconce: title, authors, date, toc

```
TITLE: Some Title  
AUTHOR: name1 at institution1, with more info, and institution2  
AUTHOR: name2 email:name2@web.com at institution  
DATE: today  
  
# A table of contents is optional:  
TOC: on
```

## Notice

Title and authors must have all information *on a single line!*

# Doconce: abstract

```
--Abstract.--  
Here goes the abstract...
```

Or:

```
--Summary.--  
Here goes the summary...
```

## Doconce: section headings

Headings are surrounded by = signs:

===== This is an H1/chapter heading =====

===== This is an H2/section heading =====

===== This is an H3/subsection heading =====

==== This is an H4/paragraph heading ====

\_\_This is a paragraph heading.\_\_

Result:

**This is an H1/chapter heading**

**This is an H2/section heading**

**This is an H3/subsection heading**

**This is an H4/paragraph heading. This is a paragraph heading.**

# Doconce: markup and lists

```
* Bullet list items start with '*'
  and may span several lines
* *Emphasized words* are possible
* _Boldface words_ are also possible
* color{red}{colored words} too
* 'inline verbatim code' is featured
  o and sublists with enumerated items starting with 'o'
  o items are just indented as you would do in email
```

This gets rendered as

- Bullet lists start with \* and may span several lines
- *Emphasized words* are possible
- **Boldface words** are also possible
- colored words too
- inline verbatim code is featured
  - ❶ and sublists with enumerated items starting with o
  - ❷ items are just indented as you would do in email

# Doconce: labels, references, index items

```
# Insert index items in the source
idx{key word1} idx{key word2}

# Label
===== Some section =====
label{this:section}

# Make reference
As we saw in Section ref{this:section}, references, index
items and labels follow a syntax similar to LaTeX
but without backslashes.

# Make reference to equations
See (ref{eq1})-(ref{myeq}).

# Make hyperlink
"some link text": "http://code.google.com/p/doconce/"

# Hyperlink with complete URL as link text
URL: "http://code.google.com/p/doconce/"
```

# Doconce: figures and movies

## Important:

Figure with HTML and  $\LaTeX$  info, and caption, *all on one line*:

```
FIGURE: [figdir/myfig, width=300 frac=1.2] My caption. label{fig1}  
# This figure will be 300 pixels wide in HTML and span 1.2 times  
# the linewidth in LaTeX.
```

Movies are also supported:

```
MOVIE: [http://www.youtube.com/embed/P8VcZzgdfSc, width=420 height=315]
```

and rendered as

<http://www.youtube.com/watch?v=P8VcZzgdfSc>

# Doconce: math

Inline math as in  $\LaTeX$ :

...where  $a = \int_{\Omega} f dx$  is an integral.

gets rendered as ...where  $a = \int_{\Omega} f dx$  is an integral.

An equation environment is surrounded by `bt!` and `et!` tags, the rest is plain  $\LaTeX$ :

```
!bt
\begin{align}
\frac{\partial u}{\partial t} &= \nabla^2 u,
\label{a:eq}\\
\nabla \cdot \mathbf{v} &= 0
\label{b:eq}
\end{align}
!et
```

which is rendered as

$$\frac{\partial u}{\partial t} = \nabla^2 u, \tag{1}$$

$$\nabla \cdot \mathbf{v} = 0 \tag{2}$$



# Doconce: math flexibility

Limit math environments to

```
\[ ... \]
```

```
\begin{equation*}
```

```
\end{equation*}
```

```
\begin{equation}
```

```
\end{equation}
```

```
\begin{align*}
```

```
\end{align*}
```

```
\begin{align}
```

```
\end{align}
```

Even though Sphinx, Markdown, and MediaWiki have problems with the latter, Doconce splits it into separate, single equations such that align with labels works accross formats.

# Doconce: displaying code

Code is enclosed in bc! and ec! tags:

```
!bc pycod
def solver(I, a, T, dt, theta):
    """Solve  $u' = -a*u$ ,  $u(0)=I$ , for  $t$  in  $(0,T]$  with steps of  $dt$ ."""
    dt = float(dt); N = int(round(T/dt)); T = N*dt
    u = zeros(N+1); t = linspace(0, T, N+1)

    u[0] = I
    for n in range(0, N):
        u[n+1] = (1 - (1-theta)*a*dt)/(1 + theta*dt*a)*u[n]
    return u, t
!ec
```

This gets rendered as

```
def solver(I, a, T, dt, theta):
    """Solve  $u' = -a*u$ ,  $u(0)=I$ , for  $t$  in  $(0,T]$  with steps of  $dt$ ."""
    dt = float(dt); N = int(round(T/dt)); T = N*dt
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    u[0] = I
    for n in range(0, N):
        u[n+1] = (1 - (1-theta)*a*dt)/(1 + theta*dt*a)*u[n]
    return u, t
```

pycod: Python snippet, pypro: complete Python program;  
fcod/fpro: Fortran; ccod/cpro: C, mcod/mpro: Matlab, etc.

# Doconce: copying code from source files

We recommend to copy as much code as possible directly from the source files:

```
@@@CODE path/to/file
```

```
@@@CODE path/to/file    fromto: start-regex@end-regex
```

For example, copying a code snippet starting with `def solver(` and ending with (line not included) `def next(x, y,` is specified by start and end regular expressions:

```
@@@CODE src/dc_mod.py  fromto: def solver\(@def next\(x,\s*y,
```

Typesetting of code is implied by the file extension:

- `.py`: `pypro` if complete file, `pycod` if snippet
- `.pyopt`: visualized execution via the Online Python Tutor
- `.f`, `.f90`, `f.95`: `fpro` and `fcod`
- `.cpp`, `.cxx`: `cpppro` and `cppcod`
- `.c`: `cpro` and `ccod`
- `.*sh`: `shpro` and `shcod`
- `.m`: `mpro` and `mcod`
- `ptex2tex` can be used to choose between 40+ typesettings of computer code in  $\text{\LaTeX}$
- `pygments` is used for code typesetting in HTML (about 10

# Doconce: displaying interactive demo code

With bc pyoptpro! or a file \*.pyopt, the code applies the Online Python Tutor for displaying program flow and state of variables:

```
def solver(I, a, T, dt, theta):  
    dt = float(dt)  
    N = int(round(T/dt))  
    T = N*dt  
    u = [0.0]*(N+1)  
    t = [i*dt for i in range(N+1)]  
  
    u[0] = I  
    for n in range(0, N):  
        u[n+1] = (1 - (1-theta)*a*dt)/(1 + theta*dt*a)*u[n]  
    return u, t  
  
u, t = solver(I=1, a=1, T=3, dt=1., theta=0.5)  
print u
```

(Visualize execution)

# Doconce: tables

time	velocity	acceleration
0.0	1.4186	-5.01
2.0	1.376512	11.919
4.0	1.1E+1	14.717624

Gets rendered as

<i>time</i>	<i>velocity</i>	<i>acceleration</i>
<i>0.0</i>	<i>1.4186</i>	<i>-5.01</i>
<i>2.0</i>	<i>1.376512</i>	<i>11.919</i>
<i>4.0</i>	<i>1.1E+1</i>	<i>14.717624</i>

# Doconce: newcommands for math

- `newcommands*.tex` files contain newcommands
- Used directly in  $\text{\LaTeX}$
- Substitution made for many other formats

# Doconce: labels, citations, index, bibliography

Labels, citations, index, and bibliography follow the ideas of L<sup>A</sup>T<sub>E</sub>X, but without backslashes:

```
===== My Section =====  
label{sec:mysec}
```

```
idx{key equation} idx{ $\nabla$  conservation}
```

We refer to Section `ref{sec:yoursec}` for background material on the *key equation*. Here we focus on the extension

```
!bt  
\begin{equation}  
\Ddt{\nabla} = \mycommand{v}, label{mysec:eq:Dudt}  
\end{equation}  
!et  
where  $\nabla$  is the material derivative of  $\nabla$ .  
Equation (ref{mysec:eq:Dudt}) is important in a number  
of contexts, see cite{Larsen_et_al_2002,Johnson_Friedman_2010a}.  
Also, cite{Miller_2000} supports such a view.
```

As see in Figure `ref{mysec:fig:myfig}`, the key equation features large, smooth regions *and* abrupt changes.

FIGURE: `[fig/myfile, width=600]` My figure. `label{mysec:fig:myfig}`

```
===== References =====
```

```
BIBFILE: papers.pub
```

The `papers.pub` file must be in Publish format (easy to make

Doconce offers a special format for *exercises*, *problems*, *projects*, and *examples*:

```
===== Problem: Flip a Coin =====
label{demo:ex:1}
files=flip_coin.py, flip_coin.pdf
solutions=mysol.txt, mysol_flip_coin.py
keywords = random numbers; Monte Carlo simulation

!bsubex
Make a program that simulates flipping a coin  $N$  times.

!bhint
Use ' $r = \text{random.random}()$ ' and define head as ' $r \leq 0.5$ '.
!ehint
!esubex

!bsubex
Compute the probability of getting heads.

!bans
0.5.
!eans
!esubex
```



**a)** Make a program that simulates flipping a coin  $N$  times.

**Hint.** Use `r = random.random()` and define head as `r <= 0.5`.

**b)** Compute the probability of getting heads.

**Answer.** 0.5.

Filenames: `flip_coin.py`, `flip_coin.pdf`.

All *exercises*, *problems*, and *projects* in a document are parsed and available in a data structure (list of dicts) for further processing (e.g., making a book of problems).

```
[{'answer': '',
  'closing_remarks': '',
  'file': ['flip_coin.py', 'flip_coin.pdf'],
  'hints': [],
  'keywords': ['random numbers', 'Monte Carlo simulation'],
  'label': 'demo:ex:1',
  'solution_file': ['mysol.txt', 'mysol_flip_coin.py'],
  'subex': [{'answer': '',
              'file': None,
              'hints': ['Use 'r = random.random()' ...'],
              'solution': '',
              'text': 'Make a program that simulates ...'},],
  'title': 'Flip a Coin',
  'type': 'Problem'}
```

# Doconce: use of preprocessors

- Simple if-else tests a la C preprocessor
- `FORMAT` variable can be used to test on format
  - if latex/pdflatex do one sort of code (raw  $\text{\LaTeX}$ )
  - if html, do another type of code (raw HTML)
- Easy to comment out large portions of text
- Easy to make different versions of the document
- The mako preprocessor is really powerful - gives a complete programming language inside the document!

Very effective way to generate slides from running text:

- Take a copy of your Doconce prose
- Strip off as much text as possible
- Emphasize key points in bullet items
- Focus on figures and movies
- Focus on key equations
- Focus on key code snippets
- Insert split! wherever you want a new slide to begin
- Insert bpop! and epop! around elements to pop up in sequence
- Use 7 = or 5 = in headings (H2 or H3)
- Slides are made with HTML5 tools such as reveal.js, deck.js, csss, or dzslides

# Doconce: example on slide code

```
!split
===== Headline =====

* Key point 1
* Key point 2
* Key point 3: Although long
  bullet points are not recommended in general, we need
  it here for demonstration purposes to investigate
  what happens with the slide layout where there is
  so much text under one point
```

FIGURE: [fig/teacher1, width=100 frac=0.5]

Key equation:

```
!bt
\[ -\nabla^2 u = f \quad \hbox{in } \Omega \]
!et
```

And maybe a final comment?

```
!split
===== Next slide... =====
```

# Doconce: example on slide code

Last page gets rendered to

## Headline

- Key point 1
- Key point 2



## Doconce: example on slide code with cells

One can introduce a table-like layout with MxN cells and put slide elements in various cell. A cell with position MN is surrounded by `bslidecell MN!` and `eslidecell!` tags. Below is an example with a bullet list to the left and a figure to the right (two cells, numbered 00 and 01).

```
!split
===== Headline =====

!bslidecell 00
!bpop
* Key point 1
* Key point 2
* Key point 3
!epop

!bpop
!bt
\[ -\nabla^2 u = f \quad \hbox{in } \Omega \]
!et
!epop

!eslidecell

!bslidecell 01
FIGURE: [fig/broken_pen_and_paper, width=400, frac=0.8]
!eslidecell

!split
===== Next slide... =====
```

Last page gets rendered to  
**Headline**

- Key point 1
- Key point 2
- Key point 3

$$-\nabla^2 u = f \quad \text{in } \Omega$$





Last page gets rendered to  
**Headline**

- Key point 1
- Key point 2
- Key point 3

$$-\nabla^2 u = f \quad \text{in } \Omega$$



Last page gets rendered to  
**Headline**

- Key point 1
- Key point 2
- Key point 3

$$-\nabla^2 u = f \quad \text{in } \Omega$$



# Doconce: slide styles

- Supported HTML5 packages:
  - reveal.js
  - deck.js
  - dzslides
  - csss
  - html5slides (experimental)
- **Problem:** each package has its own syntax (though similar)
- **Problem:** reveal and deck have numerous styles
- **Problem:** HTML5 slides need many style files
- **Problem:** original versions of the styles have too large fonts, centering, and other features not so suitable for lectures with much math and code

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  - deck.js
  - dzslides
  - csss
  - html5slides (experimental)
- **Problem:** each package has its own syntax (though similar)
  - *Example:* slide code is autogenerated from a template. Doconce handles syntax
- **Problem:** reveal and deck have numerous styles
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  - csss
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- **Problem:** each package has its own syntax (though similar)
  - **Solution:** slide code is autogenerated from compact Doconce syntax
- **Problem:** reveal and deck have numerous styles
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  - **Solution:** slide code is autogenerated from compact Doconce syntax
- **Problem:** reveal and deck have numerous styles
  - **Solution:** easy to concatenate all styles for a talk
- **Problem:** HTML5 slides need many style files
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- **Problem:** reveal and deck have numerous styles
  - **Solution:** easy to autogenerate all styles for a talk
- **Problem:** HTML5 slides need many style files
  - **Solution:** autogenerate all files to talk directory
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  - **Solution:** easy to autogenerate all styles for a talk
- **Problem:** HTML5 slides need many style files
  - **Solution:** autocopy all files to talk directory
- **Problem:** original versions of the styles have too large fonts, centering, and other features not so suitable for lectures with much math and code

# Doconce: slide styles

- Supported HTML5 packages:
  - reveal.js
  - deck.js
  - dzslides
  - csss
  - html5slides (experimental)
- **Problem:** each package has its own syntax (though similar)
  - **Solution:** slide code is autogenerated from compact Doconce syntax
- **Problem:** reveal and deck have numerous styles
  - **Solution:** easy to autogenerate all styles for a talk
- **Problem:** HTML5 slides need many style files
  - **Solution:** autocopy all files to talk directory
- **Problem:** original versions of the styles have too large fonts, centering, and other features not so suitable for lectures with much math and code

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# Doconce: output in HTML

Run in terminal window:

```
doconce format html doconcefile
```

```
# Solarized HTML style
```

```
doconce format html doconcefile --html_solarized
```

```
# Control pygments typesetting of code
```

```
doconce format html doconcefile --pygments_html_style=native
```

```
# Or use plain <pre> tag
```

```
doconce format html doconcefile --no_pygments_html
```

```
# Further making of slides
```

```
doconce slides_html doconcefile reveal --html_slide_theme=darkgray
```

# Doconce: output for blogging

Two types of blogs are supported:

- Google's blogspot.com: just paste the raw HTML (full support of math and code)
- Wordpress: despite limited math, Doconce manipulates the math such that even `equation` and `align` work in Wordpress :-)

For wordpress, add `--wordpress`:

```
doconce format html doconcefile --wordpress
```

and paste the code into the text area.

# Doconce: output in PDF

L<sup>A</sup>T<sub>E</sub>X

```
doconce format pdflatex doconcefile

# Result: doconcefile.p.tex (ptex2tex file)
# Run either
ptex2tex doconcefile
# or
doconce ptex2tex doconcefile -DHELVETICA envir=minted

pdflatex doconcefile
bibtex doconcefile
pdflatex doconcefile

# More control of how code is typeset
doconce format pdflatex doconcefile --minted_latex_style=trac
doconce ptex2tex doconcefile envir=minted

doconce format pdflatex doconcefile
doconce ptex2tex doconcefile envir=ans:nt
```

# Doconce: output in Sphinx

```
doconce format sphinx doconcefile  
  
# Autocreate sphinx directory  
doconce sphinx_dir theme=pyramid doconcefile  
  
# Copy files and build HTML document  
python automake-sphinx.py  
  
google-chrome sphinx-rootdir/_build/html/index.html
```

Much easier than running the Sphinx tools manually!

# Doconce: output for wiki

Only MediaWiki supports math.

```
doconce format mwiki doconcefile
```

Recommended site:

- ShoutWiki for standard wikis

Publishing of "official" documents:

- Wikibooks (can test code in the "sandbox":  
<http://en.wikibooks.org/wiki/Wikibooks:Sandbox>)
- Wikipedia

# Doconce: output in other formats

```
doconce format pandoc doconcefile # (Pandoc extended) Markdown
doconce format gwiki doconcefile # Googlecode wiki
doconce format cwiki doconcefile # Creole wiki (Bitbucket)
doconce format rst doconcefile # reStructuredText
doconce format plain doconcefile # plain, untagged text for email
```

# Doconce: installation

- Ubuntu: `sudo apt-get install python-doconce` (old version!)
- Source at Googlecode (recommended!)
- Check out source, `sudo python setyp.py install`
- Many dependencies...
- Must have preprocess and mako
- Need latex, sphinx, pandoc, etc. (see Installation in manual)
- Easy for slides: only preprocess is needed :-)

## Writing tips

- See the previous *Concerns I, II and III* slides for issues when writing for multiple formats. However: Doconce makes a fix so that Sphinx and other formats works with labels in align environments :-)
- Prepare figures in the right format: EPS for latex, PDF for pdflatex, PNG, GIF or JPEG for HTML formats (html, and HTML output from sphinx, rst, pandoc). One can omit the figure file extension and doconce will pick the most appropriate file for the given output format.
- Let plotting programs produce both PDF/EPS and PNG files. (Recall that PDF and EPS are vector graphics formats that can scale to any size with much higher quality than PNG or other bitmap formats.)
- Use `doconce combine_images` to combine several images into one.
- Use `doconce spellcheck *.do.txt` to automatically spellcheck files.
- Avoid page references and footnotes.



## More writing tips

- `\bm{u}` gives nicer boldface typesetting of math symbols than the alternatives `\boldsymbol{u}` and `\pmb{u}`.
- For HTML-based formats using MathJax, `\bm{u}` is not supported and therefore automatically replaced by `\boldsymbol{u}` by Doconce.
- Use `\\textcolor{blue}{formula}` in math expressions to color a part.
- Not all  $\text{\LaTeX}$  math is supported by MathJax. Some legal  $\text{\LaTeX}$  math might give MathJax problems - then one has to rewrite the expression to find a syntax that works both with  $\text{\LaTeX}$  and MathJax.

# Writing tips for sphinx and other formats

For output formats different from `latex`, `pdflatex`, and `html`, the following points are important:

- Do not use math in section headings or figure captions if output in `sphinx` is wanted (such math are removed in references).
- Let all running text start in column 1 (`sphinx` is annoyed by intended lines).
- Use progressive section headings: after chapter (=====  
comes section (=====  
and then subsection (=====  
before paragraph heading (==). "Jumps", say == after ===== works fine for `latex`, `pdflatex`, and `html`, but not for `rst` and `sphinx`.
- Place index entries (`\index{keyword}`) before the paragraph where they are introduced (not inside the text). Also place index entries before == headings.
- Use labels only right after section headings and in equations.
- Be careful with labels in `align` math environments: `pandoc` and `mwiki` cannot refer to them.