

REPORT ON THE MAKING OF THE DAFX-06 PROCEEDINGS

Vincent Verfaillie

SPCL/IDMIL, CIRMMT

Schulich School of Music – McGill University

Montréal, Qc, Canada

vincent@music.mcgill.ca

ABSTRACT

This report discusses the making of the DAFX-06 proceedings. It briefly explores PDF-related issues, and proposes a \LaTeX solution. As it was successfully used for DAFX-06, this solution is explained, described, and distributed in the interest that the whole community may benefit from it.

Last update (Oct. 14, 2007): I recently developed a new \LaTeX package called `confproc`. You can find it at CTAN: [macros/latex/contrib/conferences/confproc/](http://www.ctan.org/ctan/macros/latex/contrib/conferences/confproc/). This package implements all the features described here, together with new features and full documentation [5]. I encourage people to use it and to send feedback! This report provides complementary information. However, the original scripts are obsolete and are not distributed anymore.

Contents

1	Introduction	351
2	Technical solutions for producing proceedings	351
2.1	Some solutions for combining PDF files	351
2.2	Not-too-bad solution for generating the PDF Proceedings	352
3	Description of the solution developed	352
3.1	General description	352
3.2	Proceedings layout	353
3.3	PDF and bookmark tricks	353
3.4	Prepare each paper for insertion: page numbering	353
3.5	Bibliography/ies	353
4	Production considerations	354
4.1	Further papers edition	354
4.2	Ensure the quality of the graphics	355
4.3	Ensure fonts embedding in the PDF	355
5	Conclusions	355
6	References	355

1. INTRODUCTION

When editing the proceedings for the DAFX-06 conference, I faced the question of the quality of the proceedings. In order to improve on the proceedings of previous DAFX conferences, I decided to produce the proceedings as a PDF file concatenating all the papers, and I proposed advanced functionalities such as internal links. The electronic version of the proceedings was expected to have to give access to all the papers, to preserve their internal links, and to provide links to the corresponding pages from the table of contents, from the author's index, and from the general bookmarks.

An observation of the existing tools indicated that this was not feasible without a lot of work that could not be 100% automatized. There is no magic solution to concatenate PDF files with internal links and to add links to those pages from the table of contents, index of authors, etc. The compromise I found was to take the solution that would best automatize the processes and provide proceedings with all indicated features, should this require a two-step navigation in the proceedings.

All libraries I found to manipulate PDF files do break hyper-references and internal links of PDF files that are concatenated. The solution I chose was to use \LaTeX and `pdf \LaTeX` , avoiding other tools so that bookmarks automatically generated and PDF links are well preserved. Using \LaTeX , I then had the opportunity to make valuable contributions, such as the general bibliography of the proceedings. This report deals with the following topics:

- the information found, collected and used to produce good quality proceedings for DAFX-06;
- an example using this solution, implementing:
 - conference program;
 - PDF functionalities: hyper-references, bookmarks, access to individual papers, etc.;
 - general bibliography;
 - index of authors.

Doing so, I hope that this solution will be used by other proceedings editors and will save them time!

2. TECHNICAL SOLUTIONS FOR PRODUCING PROCEEDINGS

2.1. Some solutions for combining PDF files

We first looked for solutions to combine several PDF files into a single file. This concatenation can be made using Acrobat Professional [1]. This process however does not provide functionalities \LaTeX can automatically provide, such as automatic construction of the table of contents, bookmarks, index of authors, and general

bibliography with back-references.

The following were some of the proposed solutions involving L^AT_EX:

1. create the proceedings by inserting all papers:
 - (a) the package **combine** [2] was designed to combine articles into proceedings. It however had the could do the trick if it did not have the following problems:
 - i. incompatibility with **dafx06.sty** and hyperrefs;
 - ii. some problems with **fancyhdr.sty**;
 - (b) the style **mini.sty**: no successful result yet;
 - (c) package **subfiles.sty**: unable to insert papers as independent documents;
 - (d) class **editor.cls** from AMS;
2. concat PDF files:
 - (a) using Adobe Acrobat: one needs to edit the table of contents, index, and prepare boxes for the links... This sounds like hours of work to me. And that would need to be re-done in case of any minor change!
 - (b) L^AT_EX's package **pdfpages**: it can create the table of contents (what about the index?), but the PDF files are included as images (internal hyperrefs are lost);
 - (c) a combination of both could work: create the table of contents, page numbering and index with **pdfpages**, concat all files in Acrobat, delete the corrupted PDF pages (without internal hyperlinks), and rectify the internal links;
3. make the proceedings by concatenating all papers (Acrobat Professional \$);
4. creating by hand the table of contents. the problem is that boxes for the hyperlinks have to be drawn 1 by 1 in Acrobat (**pdfpages** does it for you);
5. modify the table of contents style (page number on the left, title and author's list on 2 separate lines):
 - (a) use the **layouts** package? Not easy.
 - (b) use the **tocloft** package?
 - (c) use the **minitoc** + the **titlesec** packages!
6. use the **multitoc** package for a multi-column TOC;
7. create valid bookmarks: when using the **minitoc** package to manage the toc and **titletoc** to manage its layout, the bookmarks are not properly created. This is due to the fact that I add contents to the toc using `\mtcaddchapter[]` but do not really insert a chapter¹. A solution that always works: replace the **minitoc** package and the use of the `\mtcaddchapter[]` command by:

```
\phantomsection
\addcontentsline{toc}{chapter}{Session: blah}
```

¹When inserting a chapter* for real, it works. This is not a big deal, since it only concerns the electronic version, for which PDF papers will have to be replaced by the real ones...

2.2. Not-too-bad solution for generating the PDF Proceedings

A not-too-bad solution would rely on L^AT_EX to generate the table of contents, correct page numbers, and the index of authors, and on Acrobat to correct the broken internal links:

- use the **pdfpages** package to generate the printed proceedings: fancy headers, table of contents, index of authors;
- generate each paper independently with proper first page number;
- save each paper under a name such as:
 - *p_NNN.pdf* for insertion in the all-in-one PDF file for proceedings
 - *DAFx06_Author1_Author2.pdf* for the CD-Rom, website, etc.
- create the All-in-one PDF for printed version:
 - using the **pdfpages** package well set, create the final printed version, with correct pages number
 - using the *dafxmaketoc5.pl* Perl script (done by Mark Zadel), generate the L^AT_EX text for inserting all papers and creating a correct table of contents
 - MAYBE manage the back reference and global bibliography (see sec. 3.5.1)
- create the All-in-one PDF with valid internal hyperlinks:
 - using Acrobat Professional, create a new document with the **pdfpages** made all-in-one, and all the *p_NNN.pdf* files
 - insert the $N_i - 1$ pages of each paper i , and replace last page by a citation of local bibliography, so that it appears in the full bibliography
 - delete all the invalid pages from the all-in-one inserted file
 - use the hyperlink boxes to redirect to the proper pages in the table of contents and index
 - remove the local toc for each paper, and change the file name to the Title (can be done with **hyperref** package [3]??)

3. DESCRIPTION OF THE SOLUTION DEVELOPED

3.1. General description

I took a lot of time and effort when preparing the proceedings with L^AT_EX. Even though I found valuable contributions from other people [1], I had to find many tricks (see previous section) in order to build up a L^AT_EX document that provides the following features:

1. possibility to automatically generate the proceedings, after changing any of its paper information
2. concatenation of papers: insertion of several individual L^AT_EX documents into one document (the proceedings). We used the **pdfpages** package [4].
3. access to papers: offering the possibility to access any individual paper by one click from the proceedings. This is a simple feature offered by the **pdfpages** package.
4. TOC layout: a table of contents with page numbers on the left! The package **titlesec** and some patience allow to do this.
5. index of authors layout: an index of authors displayed over 3 columns. We did a **threecolindex** hack, derived from the **twocolindex**, and used it combined with the **multicolumn** package.

6. hyper-references: ‘clickable’ links embedded in the ‘Table of contents’, the ‘Index of authors’ and the ‘Full bibliography’ sections to access related pages. This is provided by the ‘hyperref’ package.
7. bookmarks:
 - (a) the table of contents and index of authors properly appearing in the bookmarks, and only the index of authors appearing in the table of contents: the **tocbibind** package is what I needed.
 - (b) functioning bookmarks of such a concatenation of PDF files to allow access to the proceedings’ sections, *i.e.* the preamble, the table of contents, the sessions, the full bibliography, and the index of authors. Also, authors’ names appear under their relative paper title. We sometimes had to manually add the items in the bookmark.
8. full bibliography:
 - (a) compilation of all bibliographic references from each DAFx-06 paper, where page numbers (back-references) of each entry link to the bibliography sections that include it (*i.e.* the last page of each paper citing the item) appear at the end, right-flushed.
 - (b) The compilation was hand-made, merged, and then used to recompile each individual paper.
 - (c) Then, back-references can be automatically given by the **hyperref** package.
 - (d) Having the back-references right-flushed requires to hack the **newapa.bst** bibliography style.
9. fast LaTeX compilation: when repetitively correcting errors, changing the layout, checking if the expected features of the final PDF file are functioning, I may want to compile the proceedings as fast as possible. The **pdfpages** package offers some faster LaTeX compilation by not inserting the PDF pages, which can be helpful while dealing with other aspects such as the conference program (order of the papers in the table of contents), the index of authors, the bookmarks settings, etc. Then, the **draft** option is used:

```
\usepackage[draft]{pdfpages}
```
10. ordering the packages: as soon as you use a complex package such as **hyperref** that redefines most of LaTeX internal commands, a lot of care is required to properly order the list of packages, otherwise some features may disappear.

3.2. Proceedings layout

Some general considerations:

- the proceedings may have the same layout as individual papers, in terms of headings, fonts, etc.;
- the index of authors is long and should have 3 columns.
- a twoside-book style is great for publishing the proceedings.

3.3. PDF and bookmark tricks

With proper settings, the **hyperref** package automatically generates back-references, clickable table of contents, links to emails and URLs for you.

I organized the data in the bookmark as follows: each session is a bookmark at level 0, then the paper title is at level 1, and its list of authors are level 2 entries.

I used the `\break` command to define a title that will both work for creating a breakline in the PDF, and no breakline error for the PDF metadata. Note that there must be a space before and after, otherwise neighbor words will be glued together in the metadata.

To have proper accents in the PDF metadata, I first tried defining a different string for \LaTeX and for the PDF bookmark. then, I discovered that using proper font encoding was much more efficient!

3.4. Prepare each paper for insertion: page numbering

There are two ways to do this:

- use the `\setcounter{page}{1}` line in the paper, and replace the 1 by the real number
- refer to a .tex file containing all page numbers, and refer to it by the paper ID. By doing so, you can update the order of the papers in order to build the table of contents without having to re-edit all the papers. You will only have to recompile them once, for example using a script, once the paper ordering is defined. An example is provided as follows:

```
\input{../../../../pages.tex}\setpagenumber{48}.
```

Here, the ID paper is 48.

3.5. Bibliography/ies

3.5.1. Managing global bibliography

To create the general bibliography for the printed version:

- use the **backref** option from the package **hyperref**;
- for each paper:
 - create a *p_XXX.bib* biblio file;
 - check if only current bib items are included, remove others;
- create the complete bibliography:
 - compile the complete bibliography, using `\nocite{*}`;
 - remove double items;
 - correct inconsistent references;
- once everything else in the proceedings is done (table of contents, index, etc), create the back references with one of those two solutions:
 - Good trick (labels/refs):
 - insert the $N_i - 1$ pages of each paper *i* and replace the last page by a citation of local bibliography. Then, bib items properly appear in the full bibliography;
 - save the *DAFx06_Proceedings.brf* file under another name;
 - recompile the Proceedings without replacing last page by bibliography;
 - rename the *DAFx06_Proceedings.brf* file properly;
 - one last compile, and the backref are ok!
 - Rk: one should NOT recompile the bibliography without doing this manipulation again
 - generate the *DAFx06_Proceedings.brf* file by hand!
 - create the general backref file *DAFx06_Proceedings.brf* using lines such as:

```
\backcite{Ref1,Ref2,Ref3}{{12}%  
{(document)}}{Doc-Start}}
```

- update all pages numbers in the *DAFx06_Proceedings.brf* back references file;
- have a back reference for each page where the reference is appearing (maybe several for each paper);
- save your *DAFx06_Proceedings.brf* file under another name, since it will be erase by the next bib compilation.

Rmk: another solution (the one used in the DAFx-06 scripts and later in the **confproc** package) consists in compiling several times with the last page replaced by the citations, and making a last L^AT_EX run with the full paper inclusion!

To create the general bibliography for the electronic version:

- follow the same steps as for the printed version;
- correct the bookmark references by hand in order to point to the right places in the text (if several places, do it for each).

3.5.2. Which bib styles?

- each paper used the proceedings templates with the **IEEEbib.bst** bibliographic style. It however is quite old (1993), and not as compact as the latest **IEEEtran.bst** style.
- the **IEEEtranS.bst** style sorts the entry alphabetically, whereas DAFx proceedings (based on the IEEE publications) use the order of appearance. Therefore, the DAFx-06 templates were corrected so as to use **IEEEtran.bst** before inserting the papers into the proceedings.
- the general bibliography is a bit different: since it does not need any numbering, it has to look more like APA. A style was then derived from APA (no numbering, author list as ““Lastname, F.”, etc).

3.5.3. Right-flushing the biblio back-references

Please note that the **newapa.bst** file was slightly edited in many places (but not the **newapa.sty**), and renamed **newapave.bst** (res. **newapave.sty**) for the DAFx-06 proceedings. This was done to adjust the bibliography style and layout, for instance to provide right-flushed back-references. If you wanted to keep this aspect, here is the hack:

Edit the function corresponding to the last displayed item of the bibliographic element list (**output.year.check** in our case, because it was reformatted) so as to add a **\hfill** at the end of the command (the year definition in our example).

```
FUNCTION {output.year.check}
{ year empty$
  { ‘empty year in ‘ cite$ * warning$ }
  { write$
    ‘ (“_year*_extra.label*_‘)” *
    mid.sentence ’output.state_:=
  }
}
\if$
}
```

If the item you want to display last (in our case, the year) is not in last position, this requires that you also edit the following functions (not exhaustive list):

- FUNCTION {article}
- FUNCTION {book}
- FUNCTION {booklet}
- FUNCTION {inbook}
- FUNCTION {incollection}

- FUNCTION {inproceedings}
- FUNCTION {manual}
- FUNCTION {masterthesis}
- FUNCTION {misc}
- FUNCTION {phdthesis}
- FUNCTION {proceedings}
- FUNCTION {techreport}
- FUNCTION {unpublished}

The Unix **diff** command may help you to compare the original and modified version of the **newapa.bst** files.

3.5.4. Ensuring right-flushed back-references

With the hack I did in the bibliography style to modify the new APA style, all bibliographic back-reference numbers should appear as right-flushed. However, it sometimes does not work, due to L^AT_EX formatting mechanisms I did not identify. For instance, sometimes a list of numbers will see its last item appearing alone on next line, even though there is obviously enough space on the previous line (where the other numbers appear). Some minor reformatting of the concerned bibliographic item can solve this issue. Note that there is no way to automatically do this, nor a general rule. Here are a few tricks I found were efficient to solve this issue in 6 items of the DAFx-06 proceedings:

- move a field from optional to compulsory (such as the proceedings volume number for a proceedings paper);
- replace a --- by a -- (arg! so ugly...);
- add a missing space (e.g. between the thesis number and the URL);
- use hyphenation to your advantage, when a bib item layout does not separate the title from the next block (I suspect the whole process behind the **\hfill** command).

4. PRODUCTION CONSIDERATIONS

4.1. Further papers edition

4.1.1. Improving layout quality: send editing notes to authors

To improve the quality of the proceedings, I listed common errors and gave feedback to the authors of all accepted papers:

- examine all papers so as to list the common errors and electronic paper info (PDF version, PDF generator, valid hyperref, etc, see sec. 4.1.2) (10 h);
- create the full list of problems in a M\$ Excel file, with papers’ title, index and author’s email (1/2 h)
- fill the data in column by column (30 h) – see an example in *papers_edition_notes_0_04.xls*;
- create a Perl script to convert info in a CVS export of this file (*papers_edition_notes_0_04.cvs*) into usual sentences and indications of what to do (see *editionnotes2.pl*) in order to improve the paper quality (4 h);
- create an AppleScript (see *Create_Edition_Notes_Message3*) to convert this text file into a list of email texts, ready to be sent to authors (4 h).

4.1.2. Editing the papers

I verified each paper for the following items:

- US letter instead of A4 format;

- title has a `\break` at the right place;
- affiliation chosen is the right one and has the minimal size;
- affiliation is properly layed out;
- author’s email exists;
- captions are in italic, with a “.” at the end;
- all figures are referenced in the text;
- bib items have volume and number, as well as page number or preprint number (AES convention);
- bib items use generally defined strings, so as to be identical each time it is cited;
- math units: physics convention is roman, not italic (*ie.* not \LaTeX ’s math style). Ex: 5 Hz, and not $5Hz$.

To ensure a uniform look, all papers were modified concerning:

- URL: all indicated URL have a default font that is too wide. Then, it was changed adding the following command in the preamble
`\usepackage{url}\urlstyle{sf}`
- all `\href{}{}` commands related to URL (*ie.* all except emails) where converted to URL, because it hyphens automatically.

Some not-so-minor comments:

- the only way to do a valid line break in the paper title is not `\newline`, nor `\\`, but with the `\break` command. That way, it works similarly for both the `\title` and the `\pdftitle` in metadata. Note also that using `\linebreak` will create an unbalanced title! Please, do not ask me why...
- use the `balance.sty` package to balance the last page, especially the bibliography.

4.1.3. Word to \LaTeX conversion

1. copy and paste the text;
2. update the header (author, title, affiliation);
3. add section & subsection styles, etc.;
4. insert figures;
5. update captions;
6. update figure labels & refs;
7. edit equations (in and out of the text);
8. update eq labels & refs;
9. update section labels & refs;
10. replace Word quotes by \LaTeX quotes;
11. formatting such as italic, capitals, bold, etc;
12. remove useless hyphenations “-”.

4.2. Ensure the quality of the graphics

The best way to ensure excellent quality for graphics in the electronic version of the proceedings is by using vectorial images, *ie.* postscript or PDF files. It should be the same for the printed version, except that the font problem with Matlab described in sec. 4.3 may imply converting vectorial images to bitmap images (such as .png or .gif).

4.3. Ensure fonts embedding in the PDF

With Matlab, the system fonts such as Arial or Helvetica are not embedded at all in the PDF or in the eps file. This can be checked by converting any of the two into another format using Ghostscript. For instance, converting a .pdf to .ps using `pdf2ps` will show the following log info:

```
Warning: Fonts with Subtype = /TrueType should be
embedded.
The following fonts were not embedded:
  Arial-ItalicMT
  ArialMT
```

```
This file had errors that were repaired or ignored.
The file was produced by:
>>>> pdfTeX-0.14h <<<<
Please notify the author of the software that
produced this file that it does not conform to
Adobe’s published PDF
specification.
```

Therefore, when printing on a system that is not yours (and that may be the one you will use to print the proceedings), the printer may be set so as not to replace a missing font by a similar one. Then, Matlab text can be totally replaced by other numbers, letters, and so on!

One solution I found was to use Acrobat Professional (\$), with the PitStop plug-ins (\$ again), and set it so as to create a report and solve problems concerning partially or not embedded fonts. Unfortunately, the problem is not exactly the font embedding; rather, the glyph table mapping is wrong. Indeed, just process a PDF file produced by Matlab using Ghostscript, or Acrobat Distiller (\$), and you will get errors telling you that the file is not really valid.

Another solution is converting the PDF files to a bitmap format. It is quite dirty, since it pixellizes a vectorial image, but at least, it will print! We used the PNG format, with a figure size of 8cm wide, a 600 dpi resolution. This resolution seems too much for printers: 300 dpi may be enough.

5. CONCLUSIONS

I had a lot of fun, sometimes a hard time, working out a complete solution to produce a \LaTeX proceedings from \LaTeX papers. This solution can of course be improved upon, and I would be pleased to have feedback and advice. Note however that I do not plan on being the hotline for this hack. If you like it, please share it. If you are having problems, please first re-read this report, and check in the provided example before contacting me!

6. REFERENCES

- [1] Eoin Brazil. Creating Conference Proceedings: Tips And Tricks From The Trenches. UL-IDC-02-03. Interactive Design Centre, University of Limerick 2002. 351, 352
- [2] Peter Wilson. The `combine` class and the `combinet`, `combnat` and `combcite` packages. CTAN: macros/latex/contrib/combine/, March 2004. 352
- [3] Sebastian Rahtz and Heiko Oberdiek. The `hyperref` package. CTAN: macros/latex/contrib/hyperref/, Sept. 2006. 352
- [4] Andreas Matthias. The `pdfpages` package. CTAN: macros/latex/contrib/pdfpages/, 2004. 352
- [5] Vincent Verfaillie. The `confproc` package. CTAN: macros/latex/contrib/conferences/confproc/, Sept. 2007. 351