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Introduction

Researchers and research institutions are faced with an increasing demand for demonstrating their productivity, for example when applying for funding. Demonstrating productivity means preparing publication records, for inclusion in a CV, on a web page, or in an annual report. Preparing such publication records is time-consuming and error-prone, in particular when a large number of publications must be presented in a uniform manner.

The bibliographic reference system **Publish** solves this. Publication records (in for example BibTeX format) from a large number of researchers or departments may be imported into a common database, validated against a list of known venues (journal and conference names), checked for duplicate entries and common typos. Publication records may then be categorized and generated, in BibTeX, LATEX, or PDF format.

The database is maintained as a simple text file which may be easily edited using any text editor.

This manual describes the command-line interface of **Publish**. In addition, a programmer's interface is provided in the form of a Python module. For documentation of the Python interface, refer to the Python help system¹.

¹help(publish)

Overview

Publish handles the following three basic tasks: importing, validating, and exporting papers. We discuss these briefly below and return to discuss each of them in the following chapters.

2.1 Importing Papers

When importing a list of papers, they end up in a publication database stored as a simple text file. The file is stored in the current working directory and is named papers.pub. When new data is imported into the database, both the database and the imported data are validated. The two lists of papers are subsequently merged (with check for duplicates) and stored back to the database, as illustrated in Figure 2.1.

For more details, see Chapter 4.

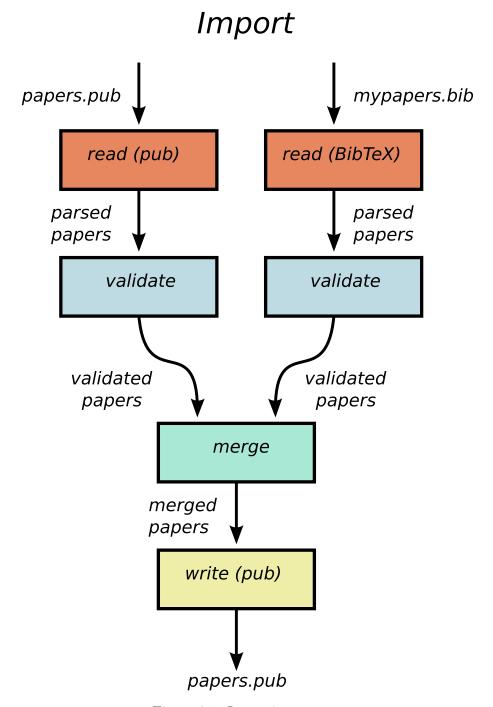


Figure 2.1: Importing papers.

2.2 Validating Papers

After data has been imported into the database, it is possible to validate the database for errors. Validation happens automatically when data is imported, so this feature is mostly relevant when the database file is edited directly. A schematic overview of the validation process is given in Figure 2.2.

For more details, see Chapter 5.

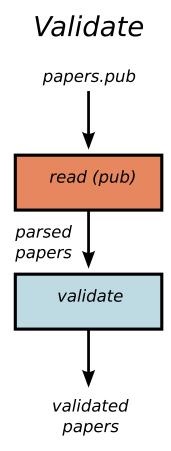


Figure 2.2: Validating papers.

2.3 Exporting Papers

Publication records may be exported from the database in one of the following formats: pub, BibTeX, LaTeX, or PDF. The user may also specify a filter to export a subset of the papers in the database, for example all papers in a specific category or from a specific year. During export, all papers are first read from the database, then validated, then filtered, and then formatted, as illustrated in Figure 2.3.

For more details, see Chapter 6.

2.4 The pub Format

The system uses its own format for storage of the papers. The format is designed to allow simple editing and looks as follows:

```
* category
** title
   attribute: value
   attribute: value
   ...
** title
   attribute: value
   attribute: value
   attribute: value
   ...
* category
   ...
```

See Appendix C for more information about the pub format.

¹The format is based on the Emacs Org-Mode. Database files may thus be conveniently edited using the Org-Mode, see Appendix B.

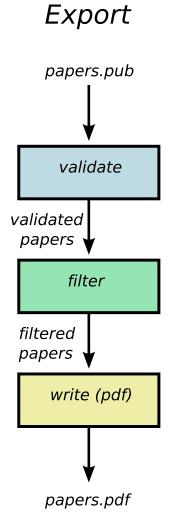


Figure 2.3: Exporting papers.

The papers imported into the system will end up in one of 12 categories, see Table 2.1. When exported to PDF or HTML², they will be put under the matching headline.

Category	Headline
articles	Articles in International Journals
books	Books
edited	Edited Books
chapters	Chapters in Books
refproceedings	Refereed Proceedings
proceedings	Conference Proceedings
reports	Technical Reports
manuals	Manuals
theses	Theses
courses	Courses
talks	Talks
misc	Other Publications

Table 2.1: Paper categories and headlines.

Which category is assigned to a paper depends on what BibTeX entry-type the paper has, or, alternatively, the category specified by the user when importing papers.

As can be seen in table 2.2, some categories match several entry-types, and some entry-types match several categories. **Publish** implements some simple rules to deduce which category should be assigned to any given paper with known BibTeX entry-type. This is discussed in more detail in Chapter 4.

²HTML-output is not implemented in version 1.0

Category	BibTeX entry-type
articles	article
books	book
edited	book, proceedings
chapters	inbook
proceedings	inproceedings, conference
reports	techreport
manuals	manual
theses	phdthesis, mastersthesis
courses, talks, misc	misc
not supported	booklet, incollection, unpublished

Table 2.2: Paper categories and corresponding BibTeX entry-types.

Basic Usage

This chapter contains installation instructions. It also contains basic information on how to use the command-line interface.

3.1 Installation

Publish follows the standard installation procedure for Python packages. Enter the source directory of **Publish** and issue the following command:

sudo python setup.py install

See Appendix A for a more detailed description.

3.2 Command-Line Interface

The synopsis for the **Publish** command-line interface looks as follows:

```
# publish <command> [command/global option]... [filename]
```

The command always starts with publish followed by a <command> which may be be either import, validate, or export. Import and export can be used with some global option, such as year=2008, or author=name_of_choice. Import and export always require a filename to import from or export to.

Examples:

```
# publish import category=books bookfile.bib
# publish export year=2002 output.pdf
```

The command validate can be used by itself or with a file with suffix .pub. If used by itself, it is the default database-file papers.pub that is validated.

Examples:

```
# publish validate
# publish validate inputfile.pub
```

The command export may be used to export a publication record, for example:

```
# publish export papers.pdf
```

This will be discussed in more detail below in Chapters 4 (importing), 5 (validation), and 6 (exporting).

3.3 Global Options

The following global options are recognized by all three commands:

• debug=yes

Enable debugging output. With this option, Python exceptions are not caught, resulting in a full Traceback on errors.

• autofix=yes

Automatically choose the default option when an error is encountered. This is useful (but dangerous) when importing large amounts of data into the database.

3.4 Configuration of the System

Much of the behavior of the system can be configured by the user. The file publish/config/defaults.py contains default values of all the variables that can be configured. This includes, for example, the name of the default database file, the venues-file, and the file where invalid papers are stored. It is also possible to change how picky the system is when judging the closeness between papers that are considered as duplicates (matching-distance_strong) and how far the system will look to suggest a venue name when a venue (journal name) is not recognized (matching_distance_weak).

To change the default settings, the user has to make a file publish_config.py and make sure the PYTHONPATH variable is set such that any import publish_config imports the desired file. This means that the user may have different publish_config.py files for different purposes, and the one to be used by **Publish** is controlled by the PYTHONPATH variable. In most cases, one would like to change the default database name or other variables for a particular project, and then it is sufficient to make a local publish_config.py file in the directory where **Publish** is supposed to be run from and where the database is to be stored

(there is no need to set PYTHONPATH in such cases since Python will always try to import from the current working directory first). Note that the user's configuration file *must* have the name publish_config.py.

Suppose we want to change the names of the database and the venues list. For this purpose we make a publish_config.py file with the following content

```
from publish.config.defaults import *

database_filename = '.publish_papers.pub'
local_venues_filename = '.publish_venues.txt'
```

Note that we start the filenames with a dot to make them hidden in the project directory.

Sometimes you may want to add words that need special capitalization. Looking at the publish/config/defaults.py file, we realize that such words are stored in a dictionary uppercase. We want to add capitalization of the words "FEniCS" and "FEniCS-based". This means that if those words, however they are capitalized in a title, will be guaranteed to be written that way. The above file will now look as follows

```
from publish.config.defaults import *

database_filename = '.publish_papers.pub'
local_venues_filename = '.publish_venues.txt'

uppercase.update({
    "fenics": "{FEniCS}",
    "fenics-based": "{FEniCS}-based",
    })
```

The syntax for specifying capitalization is taken from BibTeX. Note that the key in the uppercase dictionary must be in lowercase. Also note that we do

uppercase.update to add new items to the dictionary. Doing uppercase = ... will just assign two entries and forget about all the entries that the default settings take care (i.e., we overwrite the uppercase dictionary imported in the first line). Lists and tuples must be *extended* with new values, typically by an assignment like obj = obj + users_list.

It is possible to skip the first import line in publish_config.py files. Publish will then merge the publish_config.py contents with the default values in publish_config/defaults.py. The syntax changes a little bit in publish_config.py since the variables to be configured do not exist from an import. For example, the uppercase variable set above is not imported so we just do an ordinary assignment:

```
database_filename = '.publish_papers.pub'
local_venues_filename = '.publish_venues.txt'

uppercase = {
    "fenics": "{FEniCS}",
    "fenics-based": "{FEniCS}-based",
    }
```

Lists and tuples are not extended; just assign the desired new values.

Importing

4.1 Overview

Papers may be imported into the system using the import command (here for a file in BibTeX format):

```
# publish import inputfile.bib
```

Papers imported to the system will either end up in the database-file (papers.pub) or in a file with invalid papers that didn't pass the first round of validation. The file with the invalid papers is saved with date and time so that it can easily be located if needed. During import, the papers will be merged together with the papers already present in the database with particular attention to removing duplicate entries. The database is always saved in the pub format.

The following steps are carried out during import (see also Figure 2.1):

- 1. Read papers.pub
- 2. Validate papers.pub, see Chapter 5
- 3. Read the file which is being imported

- 4. Validate the imported file, see Chapter 5
- 5. Merge papers.pub with the imported file
- 6. Make a backup-copy of the database named papers.pub.bak
- 7. Save merge papers to papers.pub

4.2 Supported File Formats

In Table 4.1, the mapping between filename suffix and file format is shown. These are the formats currently supported by **Publish**:

Filename Suffix	File Format
.pdf	PDF
.bib	BibTeX
.bibtex	BibTeX
.tex	ĿŦĿX
.pub	pub

Table 4.1: Mapping from filename suffix to format.

4.3 Handling Invalid Papers

All invalid papers will automatically be saved to a file postfixed by the current date and time (invalid_papers-%Y%m%d-%H:%m:%S.pub), such as for example invalid_papers-20081128-21:11:47.pub.

The following steps must typically be carried out when importing papers from a file containing one or more invalid papers:

- 1. Import file
- 2. Open file with invalid papers, edit and correct the inaccuracies

- 3. Import the file with the invalid papers
- 4. Repeat as needed

Alternatively, one may also edit and validate (see next chapter) the file containing the invalid papers before they are imported into the database.

It is possible to import a file using the option autofix:

publish import autofix=yes inputfile.bib

When autofix is used, the system automatically answers all questions that arise during validation and merging. This may be useful (but somewhat dangerous) when importing a large number of papers into the database.

To see which inaccuracies that may occur during validation, see Chapter 5 (validation) below.

4.4 Handling Duplicate Papers

If two authors have entered the same paper in different (but similar) ways (for example by specifying the author list in different order) or if a conference proceeding and journal paper have identical names, a duplicate is reported during merging. The system detects this by computing the distance between paper venues (journal names) and paper titles. If this distance between two papers is less than a certain matching distance¹ then the two papers are considered as duplicates.

If a duplicate occurs, the user is faced with the following question: Attribute "name of attribute" differs, what should I do?

1. Keep both papers (marking them as allowed duplicates)

¹The matching distance matching_distance_strong can be edited in publish/config/general.py.

- 2. Ignore papers (marking them as invalid)
- 3. Keep first paper (name of first paper) and ignore second paper (name of second paper)
- 4. Keep second paper (name of second paper) and ignore first paper (name of first paper)
- 5. Use attribute from first paper (value of attribute)
- 6. Use attribute from second paper (value of attribute)
- 7. Print diff

If the user chooses to keep both papers, they are both marked as allowed duplicates, and will thereafter not be up for questioning again. If the user instead chooses to ignore the papers, they will both be marked as invalid, and end up in the file with invalid papers. Number three to six in the list are self explanatory. If the user chooses to print a diff, both papers will be shown at the same time in the terminal window, and the differences will be marked, so that the differences are easily spotted for the user.

4.5 Overriding Attributes

When importing a file with papers, it can be useful to specify certain attributes, for example by specifying department=sc (to specify publications published by the scientific computing department) and/or year=2005 (to specify that all papers were published in 2005). This means that all papers imported at this time will get those attributes and later, if one wants to extract only those papers written in 2005, they are easily found. (See Chapter 6 (Exporting) for more information about paper extraction/filtering.) The following command illustrates the above example:

publish import department=sc year=2005 inputfile.bib

Overriding attributes is mostly useful when the category is not easily deduced from the BibTeX entry-type. As shown above in Table 2.2, the category is not always evident for each BibTeX entry-type. **Publish** tries to make an intelligent choice, but this is not always possible.

For example, if a paper has the BibTeX entry-type book, then **Publish** looks for the attribute editor. If there is such an attribute, the book will end up in the category edited, and if not, the book will end up in books. Similarly, papers with entry-type misc will end up in the category courses if the attribute code is found, in talks if the attribute meeting is found, or else in misc.

However, **Publish** is currently not able to deduce whether a paper with entry-types proceedings or conference should be categorized into proceedings or refproceedings.

This must then be specified explicitly when importing papers:

publish import category=refproceedings inputfile.bib

If not otherwise specified, **Publish** places all papers with entry-type **proceeding** (or conference) into the category proceedings.

Validation

5.1 Overview

Papers will automatically be validated when imported into the system (including papers already present in the database), and when exported from the system. Validation can also be performed separately by the following command:

publish validate

This validates all papers found in the database (papers.pub).

One may also validate papers in other files, which must then be stored in the pub format:

```
# publish validate inputfile.pub
```

If a paper is valid, it is saved back to the database. Otherwise, it is marked as invalid and saved to a separate file storing invalid papers.

5.2 Checks Performed

Publish checks each paper for a number of common errors:

- Status (status specified)
- Attributes (no required attributes missing)
- Venues (matching against known venues)
- Titles (formatting, capitalization)
- Page range (formatting)
- Typos (some common typos)

We discuss each of these checks below.

5.2.1 Status

All papers must be marked with a status. If the status is missing, it will automatically be set to published. The following values should typically be used:

- inpreparation
- submitted
- accepted
- published
- withdrawn
- rejected

5.2.2 Attributes

For each category, a number of attributes are required. For all categories, the attributes title and author are always required. For a list of which attributes are required for which category, refer to Appendix C.

5.2.3 Venues

The venue (journal, conference, booktitle, etc.) for each paper is validated against a database of known venues. If an exact match is not found, the system tries to find a close match and suggests a correction.

If not found, or if the suggested choice is incorrect, the user may choose to accept the venue name as is. It will then be added to a local file of known venues (venues.list), which will be used for subsequent validations.

5.2.4 Titles

Paper titles are validated for correct capitalization. The system keeps a list of common words ("and", "or", "for" etc.) that should not be capitalized, and also a list of words that should be capitalized. The default words for capitalization are set in the lowercase and uppercase dictionaries. The default configuration is found in publish/config/defaults.py and can be extended in a user's publish_config.py file.

5.2.5 Page Range

Page ranges must be formatted x--y. Illegally formatted page ranges are automatically detected and fixed.

5.2.6 Typos

A number of typos are also detected. The default typos are found in publish/config/defaults and can be extended in a user's publish_config.py file.

Exporting

6.1 Overview

Publication records may be exported from the system using the export command (here to a file in PDF format):

```
# publish export outputfile.pdf
```

One or more filters may also be specified to extract only papers matching (or not matching) a number of attributes, for example:

```
# publish export year=2008 category=talks \
  author=langtangen outputfile.pdf
```

During export, all papers are read from the database (papers.pub), validated, filtered, and then formatted in the desired output format as determined by the filename suffix (see Figure 2.3).

6.2 Supported File Formats

Publish currently exports to the following file formats:

- pub
- BibTeX
- LATEX
- PDF

The LaTeXformat may be useful for generating publication records for inclusion in a CV or an annual report.

6.3 Filtering

Filters may be specified in one of two ways. Either, one may specify an attribute that must be satisfied by all papers to be exported, or one may specify an attribute that *must not* be satisfied by the papers to be exported. It is also possible to list several attributes and mix the two types of filters. The exported papers must then satisfy each one of the listed filters.

The following example demonstrates how to export all journal papers from the year 2008 which are *not* written by H. P. Langtangen:

```
# publish export year=2008 category=articles \
  author!="H. P. Langtangen" papers.pdf
```

When filtering on author names, it is possible to either list only the author's last name, the name with initials, or the full name. Thus, the following examples are all valid, but they may or may not give the same result, depending on how many authors are named "Langtangen", whether or not papers have been entered only with initials or with full names:

```
# publish export author=langtangen papers.pdf
# publish export author="H. P. Langtangen" papers.pdf
# publish export author="Hans Petter Langtangen" papers.pdf
```

In all of these examples, the filter will match all papers where the given author name matches at least one author in the author list (for papers with more than one author).

6.4 Options

The following additional options may be given to the export command:

• view_pdf=no

Don't display generated PDF files when exporting to PDF.

• pdf_viewer=<command>

Specify command that should be used to display PDF files.

Appendix A

Installation

Publish follows the standard installation procedure for Python packages. Enter the source directory of **Publish** and issue the following command:

sudo python setup.py install

This will install the **Publish** in a subdirectory called **publish** in the default location for user-installed Python packages (usually something like /usr/lib/python2.5/site-packages). In addition, the main script **publish** will be installed in the default directory for user-installed Python scripts (usually in /usr/bin). To see a list of optional parameters to the installation script, type

python setup.py --help

Appendix B

Emacs Org-Mode

Emacs Org-Mode makes it convinient to edit the files that are saved in the internal pub format. Emacs Org-Mode folds and unfolds sections of a file indicated with one or more * at the press of the TAB key.

Thus, one may easily fold/unfold paper categories and paper attributes which simplifies editing of large publication database files.

For download and installation instructions, visit http://orgmode.org/.

To activate Org-Mode when .pub files are opened, the following lines should be added to the user's .emacs file:

```
(setq auto-mode-alist
        (append '(("\\.org$" . org-mode))
              '(("\\.pub$" . org-mode))
              auto-mode-alist))
```

Appendix C

Internal Format (.pub)

C.1 Overview

Papers are stored in the pub format according to the following scheme:

```
* category
** title
   attribute: value
   attribute: value
   ...
** title
   attribute: value
   attribute: value
   attribute: value
   ...
* category
   ...
```

Each category is specified by a * followed by a single space and the name of the category. Within each category, each paper is specified by ** followed by a single space and the title of the paper. Then follows for each paper all attribute-value pairs separated by : (spaces ignored).

Each category specifies a number of required attributes that must be specified for each paper within that category. In addition to the required attributes, any number of additional attributes may be specified.

Currently, all attribute-value pairs must be entered in a single line (multi-line values not supported).

C.2 Example

```
* articles
** Numerical Methods for Incompressible Viscous Flow
             H. P. Langtangen, K.-A. Mardal, R. Winther
Advances in Water Resources
  author:
   journal:
             2002
   status:
             published
  number:
              1125--1146
  pages:
   volume.
             25
             SC.4.Langtangen.2002.b
  key:
   entrytype: article
** Unified Framework for Finite Element Assembly
  author: Martin Sandre Alnf\()aejs, Anders Logg, Kent-Andre Mardal, Ola Skavhaug, Hans Petter Langtangen
journal: International Journal of Nonlinear Modelling in Science and Engineering
  vear:
             2009
  status:
             published
   entrytype: article
  kev:
             Simula.SC.96
** Computational Partial Differential Equations - Numerical Methods and Diffpack Programming
            H. P. Langtangen
  author:
  publisher: Springer-Verlag
  year:
status:
             2003
            published
              2nd edition, 855 pages
   note:
  key:
             SC.1.Langtangen.2003
   entrytype: book
** {P}ython Scripting for Computational Science
  author:
            Hans Petter Langtangen
  publisher: Springer-Verlag
   year:
             2008
             published
  status:
              978-3-540-73915-9
  isbn:
   edition:
             third
  duplicate: True
             Simula.SC.63
  key:
  entrytype: book
  address: Heidelberg
* theses
school:
               Department of Informatics, University of Oslo
   year:
              2006
   thesistype: phd
   status:
              published
Odegard.2006.1
  kev:
   entrytype: phdthesis
```

C.3 Required Attributes

Some attributes are mandatory for a given category. For example, an article needs author, title, journal, and year (as well as status, but that can set by **Publish**()). The required attributes are defined in a variable category_attributes in publish/config/defaults.py and can be overridden in a user's publish_config.py file.

We refer to the category_attributes dictionary in publish/config/defaults.py for an overview of all required attributes.

Appendix D

Venues

Below are listed all venues currently known by the system.

D.1 Journals

- 1. none
 - none
 - ISSN: xxxx-xxxx
- 2. ACM Transactions on Mathematical Software
 - ACM Trans. Math. Software
 - ISSN: 0098-3500
- 3. ACM Computing Surveys
 - ACM Comput. Surv.
 - ISSN: 0360-0300
- 4. ACM SIGSOFT Software Engineering Notes
 - ACM SIGSOFT Software Engineering Notes
 - ISSN: 01635848
- 5. ACM Transactions on Multimedia Computing, Communications, and Applications
 - ACM Trans. Multimed. Comput. Comm. Appl.
 - ISSN: 1551-6857
- 6. ACM Transactions on Software Engineering and Methodology
 - ACM Trans. Software Eng. Meth.
 - ISSN: 1049-331X

7. Advances in Computational Mathematics

Adv. Comput. Math.

ISSN: 1019-7168

8. Advances in Water Resources

Adv. Water Resour. ISSN: 0309-1708

9. Annals of Biomedical Engineering

Ann. Biomed. Eng. ISSN: 0090-6964

10. Applied Cognitive Psychology

Appl. Cognit. Psychol.

ISSN: 0888-4080

11. Applied Mathematics and Computation

Appl. Math. Comput.

ISSN: 0096-3003

12. Applied Mathematical Finance

Appl. Math. Finance ISSN: 1350-486X

13. Applied Mathematical Modelling

Appl. Math. Model. ISSN: 0307-904X

14. Applied Mechanics and Engineering

Appl. Mech. Eng. ISSN: 1425-1655

15. Archives of Computational Methods in Engineering

Arch. Comput. Methods Eng.

ISSN: 1134-3060

16. Behaviour & Information Technology

Behaviour & Information Technology

ISSN: 0144-929X

17. Biophysical Journal

Biophys. J. ISSN: 0006-3495

18. BIT Numerical Mathematics

BIT

ISSN: 0006-3835

19. Campus-Wide Information Systems Camput-Wide Information Systems

ISSN: 1065-0741

20. Computers in Biology and Medicine

Comput. Biol. Med. ISSN: 0010-4825

21. Computer Communications

Comput. Comm. ISSN: 0140-3664

22. Computational Geosciences

Comput. Geosci. ISSN: 1420-0597

23. Communications in Computational Physics

Comput. Phys. ISSN: 1814-2406

24. Computers & Mathematics with Applications

Comput. Math. Appl. ISSN: 0898-1221

25. Computational Mechanics. Solids, Fluids, Engineered Material, Aging Infrastructure, Molecular Dynamics, Heat Transfer, Manufacturing Processes, Optimization,

Fracture & Integrity Comput. Mech. ISSN: 0178-7675

26. Computer Methods in Applied Mechanics and Engineering

Comput. Methods Appl. Mech. Engrg

ISSN: 0045-7825

27. Computer Methods in Biomechanics and Biomedical Engineering

Comput. Meth. Biomech. Biomed. Eng.

ISSN: 1025-5842

28. Computing in Science & Engineering

Comput. Sci. Eng. ISSN: 1521-9615

29. Computing and Visualization in Science

Comput. Vis. Sci. ISSN: 1432-9360

30. Continental Shelf Research

Continent. Shelf Res. ISSN: 0278-4343

31. Empirical Software Engineering

Empir. Software Eng. ISSN: 1382-3256

32. Engineering Analysis with Boundary Elements

Eng. Anal. Bound. Elem.

ISSN: 0955-7997

33. Formal Aspects of Computing

Formal Aspect. Comput.

ISSN: 0934-5043

34. Future Generation Computer Systems

Future Generat. Comput. Syst.

ISSN: 0167-739X

35. Global Journal of Pure and Applied Mathematics

Global J. Pure Appl. Math.

ISSN: 0973-1768

36. IEEE/ACM Transactions on Networking

IEEE/ACM Transactions on Networking

ISSN: 1063-6692

37. IEEE Communications Letters

IEEE Comm. Lett.

ISSN: 1089-7798

38. IEEE Communications Magazine

IEEE Comm. Mag.

ISSN: 0163-6804

39. IEEE Computer Applications in Power Magazine

IEEE Comput. Appl. Power Mag.

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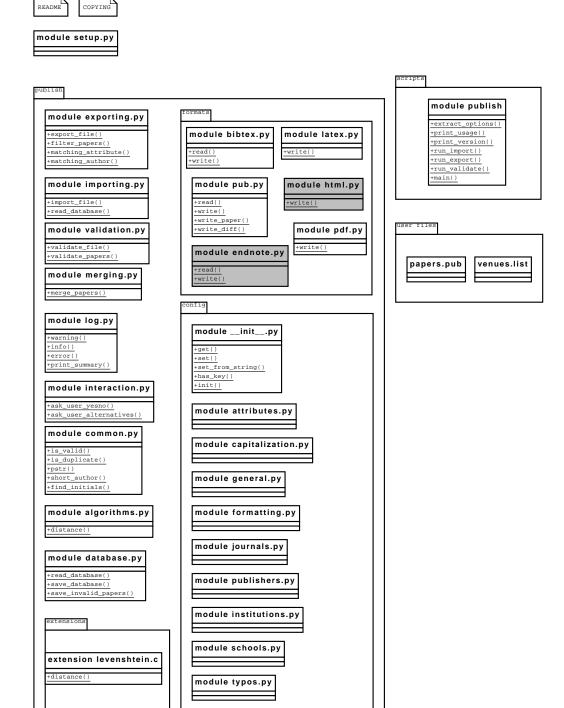
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Appendix E

Design

The figure below illustrates the design of **Publish**. Modules that are coloured grey have not yet been implemented but may be added in future versions of **Publish**.



Appendix F

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