

# Bildverarbeitung für die Medizin 2025

## Guidelines for the Creation of the Print-ready Contributions

Thomas M. Deserno<sup>1</sup>, Heinz Handels<sup>2</sup>, Andreas Maier<sup>3</sup>, Klaus Maier-Hein<sup>4</sup>,  
Christoph Palm<sup>5</sup>, Thomas T. Tolxdorff<sup>6</sup>

<sup>1</sup>Peter L. Reichertz Institut für Medizinische Informatik der TU Braunschweig und der  
Medizinischen Hochschule Hannover

<sup>2</sup>Institut für Medizinische Informatik, Universität zu Lübeck

<sup>3</sup>Fakultät für Pattern Recognition, FAU Erlangen-Nürnberg

<sup>4</sup>Medical Image Computing Group, Deutsches Krebsforschungszentrum (DKFZ)

<sup>5</sup>Regensburg Medical Image Computing (ReMIC), OTH Regensburg

<sup>6</sup>Institut für Medizinische Informatik, Charité–Universitätsmedizin Berlin  
support.bvm@plri.de

**Abstract.** The proceedings of the conference *Bildverarbeitung für die Medizin* are published in a unified form electronically and as bound proceedings.  $\LaTeX$  serves as the base for both types of publication. The template of this PDF can be used as a template, all files can be obtained from the pages of the conference. In order to be able to guarantee a unified appearance and a smooth process, we ask you to comply with the specifications described here. If necessary, submission in MS Word format is possible, however, and extra fee is charged for this.

## 1 Introduction

The publication of the contributions to the annual conference *Bildverarbeitung für die Medizin · Algorithmen, Systeme, Anwendungen* (BVM) is planned in two respects. In addition to the printed volume, which will be made available in print-on-demand, the contributions are also made available individually in electronic form by the publisher.

In order for your paper to be accepted for publication it is essential that the guidelines outlined in this document are followed. This document complies with the guidelines and should serve as a template for your own paper.

All manuscripts will be fully electronically combined in  $\LaTeX$  to form the proceedings volume and then submitted to Springer-Verlag. As an author of a paper you support yourself and us by submitting your paper directly in  $\LaTeX$ . Be sure to use the  $\LaTeX$  template provided by us for this purpose. The use of MS Word and other programs should only be considered as an emergency solution. For a smooth workflow, we recommend editing your paper using a  $\LaTeX$  editor such as TeXstudio or TeXworks in a current version. Alternatively, corresponding plugins are also available for most well-known development environments. Make sure that all files are in UTF-8 character encoding to avoid display problems.

## 2 General information

### 2.1 Fees

Detailed information on the amount and composition of fees is available at <http://www.bvm-conf.org/registrierung/>. Extra pages and conversions of MS Word submissions by the BVM team are subject to a fee and must be paid separately by the authors at 270.00€ each including VAT. The fees are additive. As the author, you must ensure that all fees are received in a timely manner on the BVM Conference account.

### 2.2 Author Contract

On the homepage of the BVM website you will find the author contract under the author guidelines. Please download it and fill in the dark fields [] accordingly. Please use the naming convention „0000-BVM-Autorenvertrag.pdf“. Once you have done this, create a signed PDF file and upload it.

### 2.3 Scope of your paper

All papers at the conference, whether presented as a talk, poster, or system demonstration, may be a maximum of 6 pages based on the layout provided here. Short articles must not exceed one page. Please do not change the formatting of this template, but shorten your text or reduce the size of illustrations to comply with this limit. Additional pages are subject to a fee (270.00€ incl. VAT per page) and will be invoiced to the authors.

Please note that all fees (Sec. 2.1) must be paid promptly upon invoicing at the beginning of the year in order for your paper to be included in the Proceedings. The decisive factor here is the length of the paper after editorial revision, not that of the submission. So, if you want to avoid shortening the text or reducing the size of your illustrations, please do not try to “trick” your way around the style guidelines, but write the text – like all other authors – according to the guidelines.

## 3 L<sup>A</sup>T<sub>E</sub>X-template

We would like to ask you to submit your paper in L<sup>A</sup>T<sub>E</sub>X if possible. The BVM Proceedings team provides you with this template for this purpose. It consists of a L<sup>A</sup>T<sub>E</sub>X-class (bvm.cls) and the L<sup>A</sup>T<sub>E</sub>X-File (0000.tex). *Important:* Edit only the latter and leave the bvm.cls file unchanged. Furthermore, you will also find a checklist in the files for a quick check of the most common sources of errors and a list of abbreviations of journal names (Sec. 3.11). You can find the latest version of all files at <https://www.bvm-conf.org/autoren/autorenrichtlinien/> or <https://bvm.plri.de>.

Please make sure that you adhere to the following guidelines. This should enable a unified appearance and facilitate the editorial post-processing. For specifics regarding a short-form submission, please refer to section 3.7.1.

This PDF is not intended to be a  $\LaTeX$  tutorial. But if you take the template as a basis, it should be possible to write your contribution without much  $\LaTeX$  knowledge. However, if you have any problems with this  $\LaTeX$  template, please feel free to contact us (Sec. 4.3).

### 3.1 Files

In order to process your contribution correctly, we need the following files. These must also be named according to the specified pattern, replace `<paper id>` with your four-digit paper id.

- Your paper as  $\LaTeX$  file (`<paper id>.tex`)
- Your bibliography entries (`<paper id>.bib`)
- All images of your paper (`<paper id>-<image name>.<format>`)
- Current reference PDF (`<paper id>.pdf`)
- The  $\LaTeX$ -class (`bvm.cls`)
- The author contract (`<paper id>-BVM-Autorenvertrag.pdf`)

All files that are not named according to this pattern will not be saved by us during upload. Please use only one `.tex` and `.bib` file and be sure to leave the  $\LaTeX$ -class `bvm.cls` unchanged. We accept the following image formats, vector graphics in EPS or PDF format are preferred:

- `eps`
- `pdf`
- `png`
- `jpeg`

Your files must be encoded in the UTF-8 character encoding to avoid display problems. This character encoding can be explicitly set in the  $\LaTeX$  editors, but is usually the default when using a current operating system.

### 3.2 Compiling

To create a PDF from the  $\LaTeX$  file, compile it with `pdflatex`. This is the default setting in most editors.

For the bibliography this year we use the package `BibLaTeX` with `Biber` as backend instead of `BibTeX`. Depending on the default settings of your editor, you may need to change this.

### 3.3 General format and page layout

The formatting of the text such as page flip, page numbers, font size and type is predefined and done automatically. Also the spacing for chapter and subchapter headings is given by  $\LaTeX$ . Please do not use your own formatting.

The first paragraph in a (sub)chapter is not indented. New paragraphs in a section are automatically indented at the beginning. Please do not insert manual line breaks with

`\newline` or `\\`. In certain environments like tables or formulas `\\` has further function and is still allowed there.

*Emphasis* can be set using `\emph`, but these emphases are very sparse and should never be used inside L<sup>A</sup>T<sub>E</sub>X commands such as `\title` or `\section`. To ensure a consistent appearance, please do not use custom text formatting such as `\textbf` or similar.

Units (m, mm, etc.) must not be italicized. To prevent this from happening inside the math mode you can use the command `\text`. To bind the unit to the numeric value with the correct spacing, please use the command `\ts`.

For readability reasons, please refrain from using footnotes<sup>1</sup> and other text annotations (these can be inserted in parentheses directly into the text).

### 3.4 Preamble

Do not change anything in the preamble (anything above `\begin{document}`) except for specifying your bibliography file. You can specify the bibliography file using the `\addbibresource{<paper id>.bib}` command. Any other changes will be lost when the book is created.

### 3.5 Language

You can choose to write your paper in English or German. For the latter, please use the rules of the new spelling. Select the language at the beginning of the document, `\selectlanguage{ngerman}` for German and `\selectlanguage{english}` for English. Depending on your choice, you must be careful to use the correct quotation marks. The German ones are identified with `\glqq ... \grqq` and the English ones with `\elqq ... \erqq`. In English, `\title`, `\subtitle`, and `\titlerunning` are to be capitalized except for connective words. The chapters of the individual contribution as well as the titles of the bibliography entries, however, are to be written in lower case except for the first letter, proper names and abbreviations (*decapitalized*).

### 3.6 Cover page

**3.6.1 Paper title.** Specify the title of your paper using the `\title` command. Avoid separations within the title with, for example, a colon or a hyphen. Instead, use the optional subtitle with the command `\subtitle`. The only exception is the “Abstract:” for short articles (Sec. 3.7.1). Title and subtitle should be decapitalized in English (Sec. 3.5).

From the given title, the L<sup>A</sup>T<sub>E</sub>X class automatically generates the entries in the header. If you get the text *Title Suppressed Due to Excessive Length* there instead of your title, please define a shortened title with the command `\titlerunning` in the header of your document and check if it now fits into the header.

---

<sup>1</sup>If footnotes are nevertheless unavoidable, use the command `\footnote`. For acknowledgements or disclaimers, instead use the `acknowledgement` or `disclaimer` environment at the end of the paper

**3.6.2 Naming of authors and institutes.** There are many ways to name the authors and institutes involved. In order to ensure a consistent naming in all contributions and the correct structure of the list of authors, please do not use additional packages such as `inst` or similar. Instead, please proceed as follows:

*Naming of institutes.* All participating institutes must be named within the `\institute` command. If multiple institutes are involved, each institute must be preceded by an ascending number with `\inst` (example: `\inst{1} Peter L. Reichertz Institut für Medizinische Informatik \\\`). If only one institute is involved, omit the number accordingly. Separate different institutes by a line break (`\\`). Name the institutions briefly enough to take up only one line each (if possible).

*Naming of authors.* Specify all authors involved using the `\author` command. To be able to guarantee a unified appearance and further functions, make sure to name each author according to the following pattern: “`Firstname~Initials. \lname{Surname} \inst{number(s)}`”. In order to ensure a correct list of authors, `\lname` must contain the *entire surname*. Abbreviate possible second names with initials and separate them from the first name with a tilde. The tilde between the first name and initials prevents the name from being split into two lines. Use `\inst` to assign the authors to the corresponding institutes, multiple entries are possible. Example: “`Thomas~M. \lname{Deserno} \inst{1,2}`”. If only one institution is involved, omit `\inst` here as well.

Separate all entries with a comma (no line break) and name the main author first. Split main authorships are unfortunately not possible with this template.

As (co-)author of several papers, please make sure that you are mentioned in each paper with your first, middle and last name in the same way, otherwise you will appear several times in the list of authors.

Additionally, specify a short form of the authors with `\authorrrunning`, this will appear in the header of the paper. Enter only the surname here. Depending on the total number of authors involved, use the following formatting.

- *one author:* `\authorrrunning{Deserno}`
- *two authors:* `\authorrrunning{Deserno \& Handels}`
- *three authors:* `\authorrrunning{Deserno, Handels \& Maier}`
- *more than three:* `\authorrrunning{Deserno et al.}`

*Email.* With the command `\email` you specify the email of the corresponding author and please write it in all lower case. It is not possible to specify multiple email addresses.

### 3.7 Outline of the paper

When structuring your paper, a distinction is made between an abstract and an article.

**3.7.1 Abstract as proceedings paper.** An abstract as a BVM proceedings paper follows the same style template as all BVM proceedings papers. However, the abstract should be structured as follows:

Abstract  
References

An abstract paper must not exceed one page. The title of the paper must start with “Abstract:” (also for German-language contributions) followed by the actual title. The  $\LaTeX$  environment `abstract` may *not* be used in this case. Care must be taken that the title does not take up more than two lines. A subtitle is allowed and must not exceed two lines either. The abstract itself is to be kept without paragraphs and footnotes. Do not use outlines like in an abstract (e.g. material and methods, results, etc.). We also ask you to refrain from using acknowledgements and disclaimers.

**3.7.2 Article as proceedings paper.** Each article as a BVM proceedings paper must be organized in its basic structure as follows:

Abstract  
1. Introduction  
2. Materials and Methods  
3. Results  
4. Discussion  
Acknowledgements and Disclaimers  
References

The abstract paragraph starts with “Abstract.” (in German “Kurzfassung.”). This formatting is achieved automatically by using the  $\LaTeX$  environment `abstract`:

```
\begin{abstract}
...
\end{abstract}
```

For acknowledgements and disclaimers, please use the `acknowledgement` and `disclaimer` environments at the end of the document. The formatting is done automatically. Abstract, Acknowledgements, Disclaimers and Bibliography are not assigned a number. The sections Introduction to Discussion are automatically numbered and should – if necessary – be subdivided into subsections. The order given in  $\LaTeX$

1. `\section`,
2. `\subsection`,
3. `\subsubsection`,
4. `\paragraph`.

must be strictly adhered to. Using the commands `\subsubsection` or `\paragraph` directly after a `\section` is not allowed – even if it saves space. This will be undone during editing and your text will have to be shortened.

For information on internal references to other sections see section 3.11.

**Tab. 1.** Example of a table with multiple rows and columns.

	column 2 and 3		column 4 and 5		column 6 and 7	
row 2 and 3	value	value	value	value	value	value
	value	value	value	value	value	value
row 4 and 5	value	value	value	value	value	value
	value	value	value	value	value	value

### 3.8 Tables and figures

Each figure or table must have a subheading or caption, use the `\caption` command for this. The numbering is done automatically. Figures and tables must be explicitly referred to in the text, e.g. at the end of the sentence (Tab. 1). For more on references, see section 3.11. The statement that is to be visualized with the object must also be explicitly stated in the text. Sentences like: “figure 1 shows the result.” alone are not sufficient.

Tables are set without grid lines. The table contains only a header line, a footer line, and a line between the header line and the table body. Wide tables should be expanded to the full text width. The corresponding command sequence can be seen in the  $\LaTeX$  source code of this document and reads:

```
\begin{tabular*}{\textwidth}{l@{\extracolsep\fill}llll}
...
\end{tabular*}
```

You can use table 1 as a template for your own. It is also an example of using the packages *multicol* and *multirow*.

Smaller objects can be placed arbitrarily (Fig. 1). Use the `SCfigure` or `SCTable` environments from the *sidecap* package. The text is aligned next to the objects. Please use this for images with a width smaller than  $0.7*\text{textwidth}$ .

**Fig. 1.** Example of a small image where the caption is placed next to the image.

Larger tables or figures should only be placed at the top (preferred position for tables) or bottom (preferred position for images) of the page. This provides a unified appearance for the proceedings, which also increases the readability of the individual papers. Please note that if images and tables are placed at the top of the page, the label will be placed above the object. If, on the other hand, the objects are placed at the bottom of the page,

the caption is placed below them. In your  $\LaTeX$  source code, the `\caption` command must be in the right place. Captions should be written in  $\LaTeX$  source code if possible and should not be included into the image. They should consist of at least one complete sentence and end with a period. Exceptions to this are subheadings (e.g. Fig. 2a), which can also consist only of individual keywords and then end accordingly without a period.

In  $\LaTeX$  you can include graphics (preferably in EPS or PDF-format) directly into the document. Use the  $\LaTeX$  command `\includegraphics` from the  $\LaTeX$  package *graphicx* for this. If you want to combine multiple images or tables under one caption, use the `subfigure` and `subtable` environments provided by the *subcaption* package. (Fig. 2). These also allow subheadings and references to individual subimages (Fig. 2b). Further examples for tables can be found in the code.

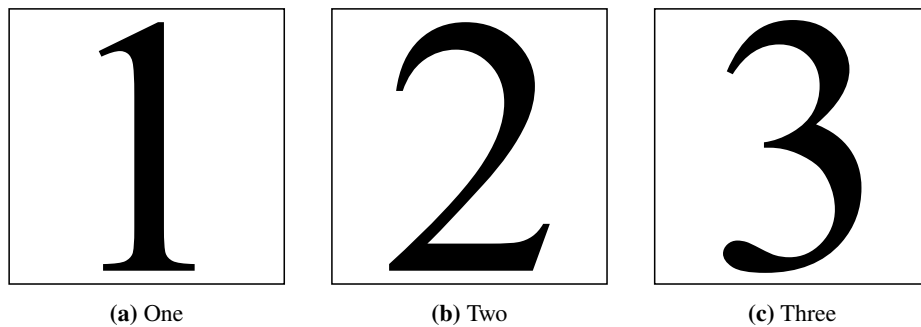
### 3.9 Formulas

Simpler formulas like  $x + y = z$  can appear continuously in the text, longer or important mathematical formulas are center-aligned within the page

$$\sin(x) = \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{(2n+1)!} \quad (1)$$

$$= \frac{x}{1!} - \frac{x^3}{3!} + \frac{x^5}{5!} \mp \dots \quad (2)$$

and numbered consecutively on the right margin at the level of the equal sign. Use the `align` environment of the *amsmath* package for this. This also allows multiline formulas. Please refrain from using a colon directly before and a period as the end of the sentence within the equation. Mathematical formula characters and symbols are *italicized*, but function names and other name identifiers are not. Units are bound to the numeric value at the correct spacing with the  $\LaTeX$  macro `\ts`. The source code of the equations 1 and 2 gives here examples how this can be set with  $\LaTeX$ .



**Fig. 2.** Example of including multiple graphics under one heading.



### 3.10 Algorithms

Using the packages *algorithm* and *algorithmicx* with the *algpseudocode* layout you can illustrate an algorithm as pseudocode, e.g. the Euclidean algorithm (Alg. 1). Inside the *algorithmic* environment you can define the algorithm using special commands. Please always set this environment inside the *algorithm* environment. It treats the algorithm as float object and lets you set a heading and label. Algorithms should be placed at the top of the page if possible.

---

#### Alg. 1 Euclid's algorithm

---

```

1: procedure EUCLID( $a, b$ ) ▷ The g.c.d. of  $a$  and  $b$ 
2:    $r \leftarrow a \bmod b$ 
3:   while  $r \neq 0$  do ▷ We have the answer if  $r = 0$ 
4:      $a \leftarrow b$ 
5:      $b \leftarrow r$ 
6:      $r \leftarrow a \bmod b$ 
7:   end while
8:   return  $b$  ▷ The gcd is  $b$ 
9: end procedure

```

---

### 3.11 Bibliography and internal references

If you want to set a cross reference (e.g. to a figure or table) within the document, you must never write the number directly into the text.  $\LaTeX$  numbers all objects automatically, so the numbers may change during editing. Therefore *always* use the following commands.

For cross-references to figures, tables, sections, or formulas, you must set a marker for a cross-reference at the appropriate place in the  $\LaTeX$  code with `\label`. It is important that this is always *after* `\caption` or `\section` and never before.

Literature references to entries from your bibliography file are created using `\cite`. Please create the entries in your bibliography file in the known BibTeX or BibLaTeX format. You can use and adapt the `0000.bib` file used for the present sample document. Remember to also name your references in the form `<paper id>-<entry name>`. The small sample bibliography of this template document includes as references a journal article [1], two books [2, 3], a book chapter [4], a BVM proceedings paper [5], and a documentation [6]. Combine references to multiple literature entries in a row in one `\cite` command like `\cite{0000-01,0000-02}`.

Please make sure to use the correct category for each source in your `*.bib` file and fill at least all mandatory fields. Please include only those entries in the `*.bib` file that you also use for your contribution, `*.bib` files with your “Collected Works” make editing more difficult and are sources of avoidable errors.

Due to the limited length of the paper, you should also consider the following tips when preparing the bibliography:

- Limit yourself to the most important work that is necessary for the understanding of your contribution.

- Abbreviate journal names according to MEDLINE coding. A list of all abbreviations is enclosed.
- For books, mention only the main title.
- Mention only the name of the publisher without the word “publisher” itself.
- Reference papers from previous BVM conference as proceedings articles in the journal [5].
- In English, decapitalize the titles according to common rules (Sec. 3.5).

Create the bibliography with `\printbibliography` at the end of your document. The formatting is automatic, please do not change it.

As mentioned, all  $\LaTeX$  sources are combined into one Proceedings document. To avoid collisions in case of cross-references in the document, all internal references (`\label`, `\ref`, `\cite` etc.) must be tagged with the *BVM paper id* followed by “-”. This also applies to the file names of figures and bibliography entries, e.g. `\label{0000-...}`.

Please avoid filler words like “see” or “cf.”, instead just put the reference in brackets (Fig. 1). In this case, please abbreviate the words as follows: Figure with Fig. (ger. Abb.), table with Tab. (ger. Tab.), equations with Eq. (ger. Gl.), algorithms with Alg. (ger. Alg.) and section with Sec. (ger. Abschn.). If, on the other hand, you use a reference in the body text, please write it out. Please cite literature references without round brackets [1].

### 3.12 Packages and macros

Do not use your own packages, but limit yourself to the following selection:

- *inputenc*, *fontenc*: Correct encoding (UTF8)
- *babel*: Extended language capabilities
- *biblatex*: Improved bibliographies
- *csquotes*: Citation
- *newtxtext*, *newtxmath*: Font selection
- *amsmath*, *amsfonts*, *amssymb*, *amsxtra*: Provision of mathematical environments, symbols and commands
- *color*: Definition of own colors
- *graphicx*: To embed images
- *caption*, *subcaption*: Providing the *subfigure* and *subtable* environments
- *sidecap*: Providing the *SCfigure* and *SCtable* environment
- *footmisc*: Footnote placement
- *multicol*, *multirow*: For table editing
- *algorithm*, *algorithmicx*: Algorithms as pseudo code
- *hyperref*: Including links

All packages are included inside the class and should be included in every  $\LaTeX$  default installation. If this is not the case, you can find and download all packages from [ctan.org](http://ctan.org).

If you are used to working with *PSTricks* normally, please create a separate  $\LaTeX$  document for each image, use *PSTricks* to create only the image in it, output it as a \*.ps

**Tab. 2.** Font sizes of the individual text modules. The abbreviations *cen*, *jst* and *lhj* stand for *centered*, *justified* and *lefthand justified*.

Text	Points	Font	Format	L <sup>A</sup> T <sub>E</sub> X environment	Word print format
Title	14	bold	cen	\title{ }	Title
Subtitle	12	bold	cen	\subtitle{ }	Subtitle
Authors	10	normal	cen	\author{ }	Authors
Adresses	9	normal	cen	\institute{ }	Adresses
Email	9	normal	cen	\institute{ }	Email
Abstract	9	normal	jst	abstract	Abstract
1 Captions	12	bold	lhj	\section{ }	Caption1
1.1 Subcaptions	10	bold	lhj	\subsection{ }	Caption2
Normal text	10	normal	jst	—	Text
Equations	10	italic	cen	equation	Formula
Image captions	9	normal	jst	figure \caption{ }	Image
Table legends	9	normal	jst	table \caption{ }	Table
References	9	normal	jst	thebibliography	References
Footnotes	9	normal	jst	\footnote{ }	Footnotes

file, and use *Ghostscript* to create a \*.eps file with bounding box, which you can then include in your contribution document as described in section 3.8.

In general, use your own macros (\newcommand) as sparingly as possible. If you need your own macro definitions, write them directly in your \*.tex file after \begin{document} and include your own name in the command name, creating a unique macro name to avoid multiple definitions between contributions. Also, please avoid defining macros that you do not need in your document. Do not redefine macros using \renewcommand under any circumstances.

## 4 Submission

### 4.1 Submission for review

This template was designed for the submission of print-ready contributions. Of course, it can also be used for the submission for peer review. However, please note that your paper must be anonymized for review. To do this, simply comment out \author, \authorrunning, \institutes, and \email and compile the file as a PDF. You can upload your PDF file via <https://www.bvm-conf.org/autoren/einreichung/>. Please note the document structure required for submission, which differs somewhat from the proceedings format.

### 4.2 Submission of print-ready contributions

The submission of print-ready contributions is done via <https://bvm.plri.de/>. To log in, please use the email you provided and the password that was sent to you.

Before uploading, check the checklist again with the most common errors and specifics.

Create a *ZIP* archive containing all files mentioned in section 3.1 (*without subfolders!*) for upload to our server. If the required file(s) are missing from the *ZIP* archive, your contribution will be rejected, as well as if file names do not match the default or if folders are included in the *ZIP* archive. The checklist and list of journal abbreviations do not need to be uploaded as well.

During upload, the contents of your *ZIP* archive will undergo automatic checks for compliance with these guidelines. If you receive error messages, please correct the noted item(s) and resubmit your *ZIP* archive.

### 4.3 Troubleshooting

If you have any questions or problems, please contact the BVM Proceedings team at email `support.bvm@plri.de`. If you encounter any problems using our  $\LaTeX$  template, please feel free to contact us. The higher the percentage of contributions submitted in  $\LaTeX$ , the easier and better the book project will be.

**Disclaimer.** For disclaimers, please use the `disclaimer` environment.

**Acknowledgement.** Please write your acknowledgements within the `acknowledgement` environment.

## References

1. Ruttimann UE, Groenhuis RAJ, Webber RL. Restoration of digital multiplane. *IEEE Trans Med Imaging*. 1984;3(3):141–8.
2. Lehmann T, Oberschelp W, Pelikan E, et al. *Bildverarbeitung für die Medizin*. Berlin: Springer, 1997.
3. Handels H. *Medizinische Bildverarbeitung*. Stuttgart: Teubner, 2000.
4. Deserno TM. Fundamentals of biomedical image processing. *Biomedical Image Processing*. Vol. 3740. (Biological and Medical Physics, Biomedical Engineering). Berlin: Springer, 2011:1–51.
5. Haralick RM, Suri J, Sheehan F. Automated ventriculargram boundary delineation. *Proc BVM*. 1998:1–18.
6. Cybrary. *References/Bibliography Vancouver Style*. Australia, 2005.