DCGI

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Department of Computer Graphics and Interaction

Czech Technical University in Prague, CZ

Faculty of Electrical Engineering

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How to Write a Technical Report at the DCGI,
FEE, Czech Technical University in Prague, CZ

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Publication Notes

Publication notes are optional, they may contain the exact day of submission of the report and other details.

Abstract

This technical report provides a basic information for writing and publishing technical reports at the Department of Computer Graphics and Interaction, Faculty of Electrical Engineering, Czech Technical University in Prague. Together with the format also the procedure to issue the report number is given and the checking procedure to ensure the report quality before releasing it to the public. The publishing of these reports is planned to be electronic only, available via Internet. The availability of technical reports allows us to use them in cases, when this is needed: to provide additional detailed information to the paper published elsewhere (as the format of the conference and journal publications are strictly limited in length), to protect authorship of an idea prior to the per-reviewed publication, and to allow for follow-up papers that should be reviewed and the prior knowledge based on the unpublished previous conference/journal paper is required. Other uses are possible, but the suitability of writing a technical report should be always discussed with the head responsible for the research in the particular field.

Contents

1 Introduction

This document follows the recommendations for production of technical and scientific reports provided by Grey Literature International Steering Committee[GLI07] that are periodically updated and should be checked upon the next revision of this document. Majority of the text appearing in this technical report is taken over from the document [GLI07] without specifying quotation marks to allow for better readibility. Any text that cites, refers to, or is based on this report should first checkt the [GLI07] for original text.

Basic typographical issues are given by the style `dcgitechrep.cls` that **may not be modified by authors of a technical report** as this provides basic typographical style of all reports which has to be consistent over the series of technical reports. The style provides one column format, standard font size 11pt, and page format A4 size in LaTeX 2_ε format `http://www.latex-project.org/` which will be followed by version 3 in 2012 or later. The document style provides the standard way of conveying information using text, tables, figures in raster and vector format etc. Preferably the document should be printed double sided, single side printing should be approved by the librarian, when a printed copy is requested. The language of the technical report is **English**, the exceptions must be approved by the head of the department.

The prefered way of including images and figures is:

```
\begin{figure}[htb]
  \centering
  \includegraphics[width=0.5\linewidth]{img/image.ext}
  \caption{\label{fig:teaser}This is the legend of the image.}
\end{figure}
```
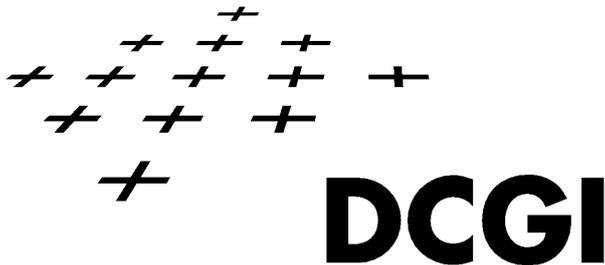
resulting for example in the figure:

Figure 1.1: This is the legend of the image.

The filename extensions (.ext) used in the `\includegraphics` command could be encapsulated postscript (.EPS) or (.PDF), or raster formats, preferably PNG (Portable Network Graphics).

2 Technical Report organization

The technical report should be organized in standard and almost the same way as an article to journal or conference. The standard structure of technical and research reports is:

- Front matter of the report, generated by the comment \makefrontcover:

  - *Title of the report* - titles must be descriptive and may include subtitles, if any. Concise titles are easier to read than long, convoluted ones. Titles that are too short may, however, lack important information. Authors should include all words in the title that will make electronic retrieval of the report both sensitive and specific. Abbreviations in the title should be avoided. The title should be short, concise, but precise and exhaustive.

  - *List of authors*, the author for the correspondence should have specified e-mail address. The authors of the report who have different affiliation than our department should be put their with the full affiliation, for example *Vienna University of Technology, The Institute of Computer Graphics and Algorithms*. The first and hence usually the responsible corresponding author of the technical report is likely to be employed by the department.

  - *The number of technical report*, specified below, see section 4.1,

  - *Year and month* of publishing the report, i.e., the date when the report is finished and approved for publication,

  - *Volume* of the report, i.e., the Volume 1 is issued at year 2011 and all the years then consequently,

  - Optionally, the *publication notes* for the technical report, that could specify the date of submission of this report and other issues for publishing,

  - *Funding Acknowledgements* for all funding organizations and institutions,

  - *Abstract* - concise summary that advocates a reader to continue reading of the whole text. Usually, the text of abstract shall not be shorter than 6 lines of the text and not longer than 15 to 20 lines of the text.

  - *Keywords* - several keywords used in the community, possibly according to ACM classification scheme http://www.acm.org/class/1998/, but not necessarily limited to that,

  - *Table of contents* (generated automatically).

- Core of the report, consisting of the individual chapters:

  - *Introduction* or *Motivation*.

  - *Previous Work* or *Related Work*

  - Body Part of the Report - description of a new method or methodology, its relation to the previously published papers. The name of chapter can be *New Algorithm, Our Method* etc., it is not unusual that two or three chapters are given, well structured by sections.

– Optionally chapter *Implementation*.

– Optionally chapter *Results* possibly followed by chapter *Discussion*.

– Obligatory chapter *Conclusion* or *Conclusions*.

– Optionally chapter *Future Work*. This could be also combined together with *Conclusion* to *Conclusion and Future Work*.

– Preferably unnumbered chapter *Acknowledgements*. It is possible to acknowledge help given in the preparation of the report, but it is not usual to acknowledge minor assistance, routine checking or secretarial work. Major contributions give the right to be included as author of the entire report or of an appendix, if it is the case.

– *List of references* or *Bibliography*, specified in standard way using BibTeX records `http://www.bibtex.org/`, available and used in computer scienes. The preferred bibliographic style is `alphaabbr.bst` available from the package for this document and on the web from `http://linuxtoosx.blogspot.com/search/label/latex`. Other possible styles are listed at: `http://www.bibtex.org/Links/`.

- End matter of the report:

  – *Appendices* - not essentail in every report, they shall be identified by consecutive letters (*Appendix A*, *Appendix B*, etc.). They are used to present material that is necessary for completeness, but would interrupt the flow of reading if inserted in the core of the report or material that is not of interest for the average reader, but only for a specialist in the field. Possible types of appendix are supplementary illustrations or tables, description of equipment, techniques, questionnaires used for surveys, raw data collected during the study, etc. References in Appendices are treated independently of those reported in the Body of report and are listed separately at the end of each Appendix.

  – *Indexes* - An index is a list of the main contents or items appearing in a report (such as personal or geographical names, or other topics) arranged in alphabetical order. It is a useful tool for long reports or texts that can be also consulted not in sequence. The choice of index depends on the type of document (e.g. in conference proceedings it is recommended to include an authors index, in a handbook an analytical one). Indexes represent an added value for the best exploitation of the document and shall be carefully organized. Word processing programs offer today a valid support for index making, but they never replace the intellectual activity behind the creation of any index.

- Back cover - generated automatically by the report style and containing address of publisher and other formal issues. This is not handled by author of the technical report, but it should be checked by `\makebackcover` command. This page should be generated always as odd one, so it is last but one page of the report.

3 Formatting the text

Below we provide remarks on writing the textual and non-textual information

3.1 Textual information

The text description and style throughout the report should follow the guidelines for scientific writing - they should be easy to read, easy to edit, and easy to understand. Simply concise and comprehensive text which is well accepted by users (readers) of the text. For more information about scientific writing, you can access the following books [Day08, SW99] and various sources on the web, such as `http://www.uclouvain.be/cps/ucl/doc/acfa/documents/hengl_rules.pdf`, `http://www.sci.sdsu.edu/~smaloy/MicrobialGenetics/topics/scientific-writing.pdf`, `http://www.biochem.arizona.edu/marc/Sci-Writing.pdf`, `http://faculty.uca.edu/march/bio1/sciwriting/writtips.htm`, and many other sources.

The most importantly, for the text all the rules applicable for text writing should be used, including the avoidance of plagiarism, the carefull checking of the text before giving for the proofreading to someone else, concise and clear writing style, avoiding colloquial and obfuscated words, writing positively, etc.

3.2 Non textual material

Non textual material generally defined as illustrations (tables, graphs, maps, photographs, flowcharts, drawings, etc.) plays a significant part in the presentation of concepts explained in the text and should be carefully organized. Illustrations summarize and emphasize key points, improve clarity and reduce narrative length. They are both an integral and independent part of the text. They offer a useful visual aid to the reader and are a time-saving writing tool. In the text they may defined as:

- Tables (logically organized sequences of numbers or words);

- Figures (every illustrative material that is not a table).

The choice between tables or figures depends on which elements are intended to be focussed (a table shows our results, a graph promotes understanding of results and suggests interpretations of their meaning and relationships; graphs shall be used as an alternative to tables with many entries without duplicating data in graphs and tables). Non textual material should be limited to that supporting the text and pertinent for the understanding of the study described.

Each item shall be numbered consecutively (Table 1, Figure 1) in the order of its first citation in the text, followed by a brief title. Illustrations shall be cited in the text and placed soon after their citation (and not before) or included in appendices if they are so detailed as to interrupt the flow of reading.

If data included in illustrations are from other published sources, permission shall be obtained by the copyright owner (except for documents in the public domain) and the original source shall be fully acknowledged.

Use of colours for illustrations should be carefully checked as in many cases grey literature including technical reports is still printed in black and white.

3.2.1 Tables

Tables are used when the attention of the reader shall be focussed on data and not on trends of data. They capture information concisely, and display it efficiently; they also provide information at any desired level of detail and precision. Including data in tables rather than text frequently makes it possible to reduce the length of the text. Oversized tables should be avoided. A table is a matrix containing rows and columns of data which must be homogeneous. Each column shall have a short heading guiding the reader in understanding the table content; each cell must contain data (in case of missing data it shall be indicated by special marks or letters). Internal horizontal or vertical lines are to be avoided whenever possible and a correct spacing may be used instead (for example, in journal Computer Graphics Forum the lines cannot be used). Authors should place explanatory matter in footnotes (not in the heading), which might contain also the explanation of non standard abbreviations.

3.2.2 Figures

Figures should include relevant information needed for evidence, efficacy or emphasis. They should be made as self-explanatory as possible using legends, when necessary. Figures shall be suitable for printing (i.e. either professionally drawn and photographed, or produced as photographic quality digital prints in JPEG or GIF formats). The important issue is the size of the figures, there must be visible information after printing without using magnifying glass (or microscope), think about the elderly readers who often uses eyeglasses.

The preferred way in year 2011 is to use vector graphics such as Portable Description Format (PDF) by Adobe or encapsulated postscript (EPS). Note that for using standard `latex` only EPS format is at disposal, for `pdflatex` you can use also PDF format, more details can be found at `http://en.wikibooks.org/wiki/LaTeX/Importing_Graphics`. Letters, numbers, and symbols should therefore be clear throughout the whole text and consistent in meaning.

If photographs of people are used, either the subjects must not be identifiable or authors must obtain a written permission to use the photographs.

3.3 Units of measurement

The use of the International System of Units (SI) for measurements is required. Thus, measurements of length, height, weight, and volume should be reported in metric units (meter, kilogram, or litre) or their decimal multiples; and temperatures should be in Celsius degrees. Non-SI units may also be used when the SI is lacking.

4　Technical Report Preparation

4.1　Issuing numbers

The report number is issued by the secretary of the department, namely by the librarian or when not present then by the head of secretariat. The request has to be provided via *e-mail* by a real person, preferably sent by responsible corresponding author, including the basic information about the technical report:

- title of the report,

- expected year and month of the publication of the technical report,

- the name of the responsible corresponding author as the person responsible to complete the report, including the contact e-mail,

- the focus or the technical report, for example *computer graphics* and *human computer interaction*.

- proposal for the person responsible for checking the quality of the technical report, see below.

- suggested report status, either *visible* or *internal*, see section 4.3.

The librarian will issue the number to the request, in the format: CS–TR–DCGI–YEAR–NUMBER for public reports, for example CS–TR–DCGI–2011-1 for this report (for internal reports in the form CS–TR–DCGI–INTERNAL–YEAR–NUMBER). Very important rule: **the author should ask for the report number only upon serious intention to complete the report.** The report which is not going to be finished in 12 months upon request for issuing the report number, will result in fine 6000,- CZK payable to the department (in year 2011). This rule is meant in order not to obfuscate the technical reports and molest the librarian. The recommended way is to write and polish the technical report using this report style here and when you are sure to give it out as technical report, then request for the number.

It can happen that the content or its part is found wrong, containing an error. Therefore, it is possible to provide the revision of the report with corrected results. In this case, the report should be checked again by proofreading person, see the next section. In this case the report has to cite the original report. When the date of publication is less than 11 months from the publication of the original report, the report can have the number in the form: CS–TR–DCGI–YEAR–NUMBER-RZ, for example CS–TR–DCGI–2011-1-R1 for this report, where Z is the number of revision of the report. The date of publishing the report should be the new one, according to the of approval the revised report by proofreading person.

4.2　Revision, Proofreading, and Quality Approval

The text should be carefully written and revised. The technical content of the document is its most important attribute. If it is flawed, it is irrelevant that it looks typographically perfect,

has excellent design and page layout and no grammatical errors. Yet, revision is a process that ensures that the technical content of a document is complete, accurate, and understandable to the intended audience and may largely improve the quality of the report guaranteeing an unsuspected added value.

The initial revisions of the document should be done by the author and co-authors. All the authors are responsible for the quality and the content of the text, however the major responsibility bears the first author of the technical report. In order to assure the text quality, the head for research in particular research field (such as computer graphics or human computer interaction) is responsible for proofreading text. He/she has to read and proofread the text or to delegate a person who is responsible to perform this task. The proofreading person reads the text and gives approval for publishing the technical report on the internet. Usually, the authors will get comments from the proofreading person and they are responsible to incorporate them to the text. Final check has to be done again by the same proofreading person.

The most importantly, as stated in [GLI07], the basic text properties should be checked for these issues:

- Policy:

  - Organization mission (the document must not be in contrast with aims and scope of the issuing organization).
  - Ethical principles (no human or animal rights shall be infringed privacy, safety, etc.).
  - Dates - the dates of the document has to be correct, backdating the technical report is forbidden (and illegal in some cases).
  - Copyright rules (no copyrighted material may be reproduced without written permission).
  - No endorsements or promotions of specific commercial products or services, unless clearly used in an advertisement, if any.

- Technical content:

  - Coherence of each part of the document (abstract, introduction, and conclusions must not contain contradictory statements);
  - Presence of all cited tables and figures (which shall be consistent with the text).
  - Tables may be checked for correct calculations of totals, averages, percentages, etc.; they may also be redesigned to improve comprehension; captions may be improved.
  - Abstracts may be rewritten to better emphasise the important points of the text.
  - Document written by several authors may be reviewed for internal consistency.
  - Punctuations may be verified to guarantee comprehension.

- Copyediting

  - Typos and spelling errors.
  - Garbled passages.
  - Missing tables and figures.
  - Format inconsistency.

- Dropped lines and words.
- Language (grammar, syntax, spelling) may be improved.
- Lists of abbreviations or symbols may be compiled.
- References may be checked for accuracy and consistency.
- Use of capital letters may be standardized.
- Use of units of measure may be checked for appropriateness and consistency.

- Upper level issues:
  - Hierarchy - the text is checked for the best organization, the hierarchy of concepts must be logical, and apparent in the structure of the document.
  - Text balance - the amount of text must be well balanced in the different parts of the document. Unneeded or inappropriate material (text, tables and figures) must be deleted. Material necessary for comprehension by the intended audience may be added.
  - Language - the language must be fluent and concise; redundancy must be eliminated.
  - Style - the style must be consistent throughout the document.

4.3   Visibility and Availability

The report can be classified into two major uses different by visibility. First, the report can be *public*, which is the preferred way. Second, the report can be classified as *internal*. This kind of report is necessary for some projects, whose results are not public or not public at the day of issuing the report but for example upon completion of the project.

When the report is classified as internal, it cannot be disseminated as public neither by librarian or secretariat of the department. In this case it is recommended that authors bear the responsibility for the document dissemination to the interested parties, such as project partners. It is then recommended to put the heading of the report clear indication about the confidentiality of the document using for example the LaTeX environment \myheading, including the text such as: "This technical report is confidential and cannot be distributed without prior written consent of authors". Or "This technical report is intended for confidential use by Firstname1 Surname1 and Firstname2 Surname2". It is always good idea to specify appropriately the eligible readers of the document and hence their responsibility to keep the document confidential than to face the leakage of information and possible threats such as law-suit due to the prohibited knowhow disclosure of your industrial partner etc. All the possible data associated with the report (and referred to herein) will have the same status (internal or public).

4.4   Report Dissemination

Upon approval of the technical report by the proofreading person (approval should preferably be given by e-mail and stored by authors), the document in PDF format is sent to the librarian and put to the website of the department. The authors should indicate if the report is internal. If this is not specified, the technical report has public status. The librarian creates and keeps the record about the technical report in the written form and on the website of the department.

The public reports are immediately put to the website of the department by the secretariat of the deparment/librarian.

The internal reports will be disseminated only by the first author of the report, who is responsible to keep the records about this dissemination, in form of date, person, e-mail, and other contact information.

4.5 BibTeX Entry

The first author will also create the bibtex entry that is passed to the department librarian together with the technical report when giving the report to be published. The preferred BibTeX entry for the technical report should look like:

```
@TechReport{CS-TR-DCGI-2011-1,
  author = {Vlastimil Havran and Jiri Bittner and
            Pavel Slavik and Jiri Zara},
  title = {{How to Write a Technical Report at the DCGI, FEE,
          Czech Technical University in Prague, CZ}},
  number = {CS-TR-DCGI-2011-1},
  type = {Research Report Series of DCGI},
  volume = {1},
  institution = {Department of Computer Graphics and Interaction},
  address = {Czech Technical University, FEE},
  year = {2011},
  month = jun,
  howpublished = {Available at http://dcgi.fel.cvut.cz/techreps},
  abstract = { \ldots },
}
```

In case the report is internal, the technical report must have the indication in the BibTeX entry:

```
@TechReport{CS-TR-DCGI-I-2011-01,
  ...
  number = {CS-TR-DCGI-INTERNAL-2011-01},
  type = {Research Report Series of DCGI},
  note = {internal technical report},
  institution = {Department of Computer Graphics and Interaction},
  ...
}
```

The citation to the document is by \cite command in LaTeX 2$_\varepsilon$, for example[HBSZ11].

5 Conclusion and Future Work

The technical report writing is not easy, but it is worthfull way of producing technical and scientific information about your work outside the world. It is guessed that half of the literature in technical sciences are technical reports so it is major publishing effort. It is important to realize the impact this so called grey literature, which is is not produced by publishing houses for immediate selling profit. For persons working in technical science including doctoral students is is almost necessary to learn to write technical reports and use them in their scientific career. We wish you to enjoy the technical report writing and using in your scientific activities.

As future work we will modify the style of this technical report for LaTeX version 3, when this version becomes available and widely used instead of currently used version LaTeX 2_ε.

Acknowledgements

We would like to thank Daniel Sýkora and Petr Olšák for their comments on the typography of this document.

Bibliography

[Day08]   R. Day. *How to Write and Publish a Scientific Paper.* Cambridge University Press, 2008.

[GLI07]   GLISC. Guidelines for the production of scientific and technical reports: how to write and distribute grey literature. Version 1.1. GLISC, 2007. Available at `http://www.glisc.info/`, last visited June 10, 2011.

[HBSZ11] V. Havran, J. Bittner, P. Slavik, and J. Zara. How to Write a Technical Report at the DCGI, FEE, Czech Technical University in Prague, CZ. Research Report Series of DCGI, CS-TR-DCGI-2011-1, Department of Computer Graphics and Interaction, Czech Technical University, FEE, June 2011.

[SW99]   W. Strunk, Jr. and E. B. White. *The Elements of Style.* Macmillan, fourth edition, 1999.

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