Int. J. Appl. Math. Comput. Sci., , Vol. , No. , –
DOI:

INSTRUCTIONS FOR AUTHORS ON HOW TO USE THE AMCS LATEX CLASS

FIRST NAME LAST NAME *, SECOND AUTHOR *,**

* Institute of xxx xxx xxx xxx
University of xxx xxx, Address xxx xxx xx xxx xxx
e-mail: xxxxxxxx

** Second affiliation

This paper describes how to use the `amcs` class with LaTeX2e to produce papers suitable for publication in the *International Journal of Applied Mathematics and Computer Science (AMCS)*. The abstract to be included here should be maximum 155 mm wide.

Keywords: keyword 1, keyword 2, . . . , keyword 5. Please provide a few keywords (3–5). This section should be maximum 155 mm wide, left justified.

1. Introduction

The `amcs.cls` document class is designed to produce papers suitable for publication in the *International Journal of Applied Mathematics and Computer Science*. It is based on the standard `article` LaTeX2e class. To properly format the text, the following standard packages are additionally required: `times`, `amsmath`, `amssymb`, `color`, `graphicx`, `caption2` with the option `hang`, `harvard` with the options `dcucite` and `abbr`. Other packages are optional and can be used when required. The text area is defined as follows: the text height is equal to 23.4 cm, the text width is 17 cm, and a two-column mode with the space between the columns equal to 8 mm is used.

2. Title page

The title area is created using the `\maketitle` command. Before invoking this command, the author has to declare all objects required to appear in the title area.

2.1. Manuscript title. An exemplary title is declared as follows:

```
\title{Numerical analysis of the algorithm}.
```

Line breaks with the command `\protect` may be used to control the length of the title:

```
\title{Numerical analysis\protect\\[+1mm]
of the algorithm}.
```

The title is used to format the headers of odd pages. The header of each odd page should be left justified and the page number right justified. In the case of a very long title, please use its short version, e.g., the first few words of the title and an ellipsis. The authors can put the short title of the paper in square brackets as an optional parameter of the `\title` command, e.g.,

```
\title[Numerical analysis ...]{Numerical
analysis of the algorithm}.
```

2.2. Authors' names. The authors' names and affiliations are declared with the `\author` command. Each author can be assigned to at most two institutions:

```
\author[Inst1][Inst2]{Author's Name}.
```

If an author is assigned to one institution only, the second square brackets should be empty:

```
\author[Inst1][]{Author's Name}.
```

For each author, a separate `\author` command should be run, e.g.,

```
\author[Inst1][]{First Author's Name}
\author[Inst2][]{Second Author's Name}.
```

Important! The `amcs` document class permits to declare at most six authors. For each author at least one institution should be declared!

2.3. Institution declaration. To define an author's affiliation, the `\address` command can be used:

```
\address[Inst1]{First affiliation}.
```

The option in square brackets is mandatory in order to assign an author to this institution. For each institution, a separate `\address` command should be run, e.g.,

```
\address[Inst1]{First affiliation}
\address[Inst2]{Second affiliation}.
```

Important! The `amcs` document class permits to declare at most six institutions.

2.4. Abstract and keywords. The abstract text is encapsulated within the `abstract` environment:

```
\begin{abstract}
The paper deals with ...
\end{abstract}.
```

The list of keywords is defined using the `keywords` environment:

```
\begin{keywors}
Keyword1, keyword2, keyword3 ...
\end{keywords}.
```

2.5. Header of the title page. The header of the title page contains the name of the journal and the following information:

- Publication year, declared with the `\Year{}` command;
- Journal volume number, declared with the `\Vol{}` command;
- Journal issue number, declared with the `\No{}` command;
- Paper final page numbering, declared with the `\Startpage{}` and `Endpage{}` commands, respectively;
- Digital Object Identifier number, declared with the `DOI{}` command.

These commands are used solely by the editioral staff, so the author can give no arguments for these commands or can even remove them from the manuscript.

3. Headers

The header of each even page should include names and initials (right justified) and the page number (left justified). To declare the authors' names, please use the `\Runauthors{}` command placed in the document preamble (before `maketitle`). For one author, give the first character of his/her first name and the full last name, e.g., for John Doe, the appropriate form is

```
\Runauthors{J. Doe}.
```

For two authors, use both authors' names, e.g.,

```
\Runauthors{J. Doe and M. John}.
```

For more than two authors, use the first author's name and "*et al.*", e.g.,

```
\Runauthors{J. Doe et al.}.
```

The header of each odd page should contain the title of the paper (left justified) and the page number (right justified). To declare the header of each odd page, please use the `\title` command (see Section 2.1).

4. Sections

Sections are defined in a common way by the commands `\section`, `\subsection`, `\subsubsection` and `\paragraph`. Arabic numbers are used for subsequent numbering. A paragraph is a section without a number. Below are examples of section formatting:

4.1. Secondary heading. Section text.

4.1.1. Tertiary heading. Section text.

Paragraph. Section text.

5. Floating material

5.1. Figures. Figures are defined in a standard manner, e.g.,

```
\begin{figure}[!b]
 \centering
 \includegraphics[width=0.45\textwidth]{
```

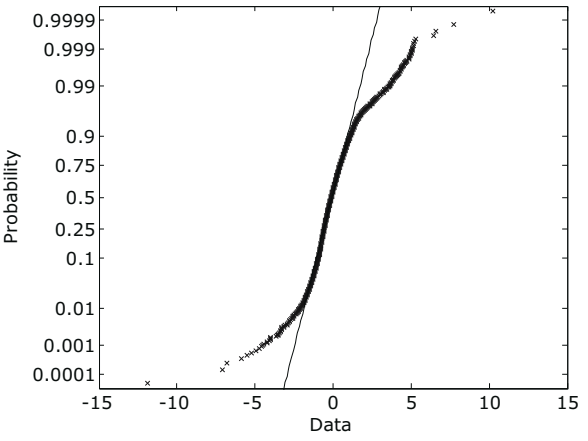
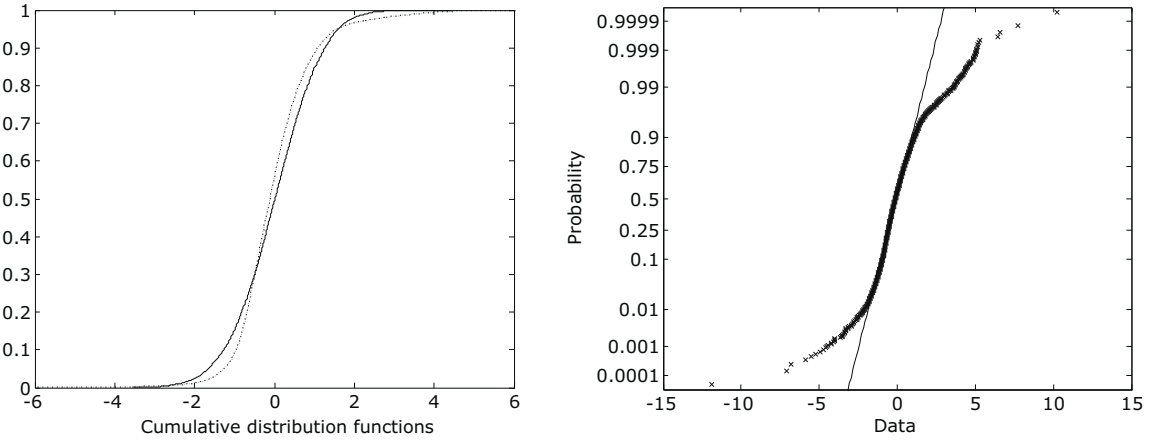


Fig. 1. Figure example 1.



(a) (b)

Fig. 2. Exemplary figure: the first graph (a), the second graph (b).

```
 figure1}
 \caption{Figure example 1.}
 \label{fig1}
\end{figure}.
```

They should be centred and placed at the top or bottom of a page if possible, as close as possible to the first reference to them. Please avoid middle in-text placement (option `h`), and do not introduce frames around the figures. To use the `\includegraphics` command, the `graphicx` package has to be loaded first. The caption of a figure should be placed below the figure to which it refers and should be ended with a full stop. In the case of multiple-part figures, enumerate each piece as (a), (b), etc., including necessary descriptions in the main caption of the figure. Use the `caption` command with the `caption2` package to format figure captions. Make sure you always employ LaTeX commands for figure captions and enumerations instead of incorporating those into the original graphics.

Sometimes, figures are too wide to fit in a single column. Then, a double-column figure environment declared with the `figure*` environment can be used:

```
\begin{figure*}[!t]
 \centering
 \includegraphics[width=0.405\textwidth]
  {cdf}\hspace{0.5cm}
  \includegraphics[width=0.45\textwidth]
  {pp-plot}\\
  (a)\hspace{8cm}(b)
  \caption{Exemplary figure: the first
  graph (a), the second graph (b)}
  \label{fig2}
\end{figure*}.
```

When referring to figures, the abbreviation "Fig." should be used.

5.2. Tables. Tables should be centred, at the top or bottom of a page if possible, and as close as possible to the first reference to them. The caption of a table should be placed over the table to which it refers and should be ended with a full stop. For example, the code

```
\begin{table}[!b]
 \centering
 \caption{Table example}
 \label{table1}
 \begin{tabular}{|c|c|c|}
  \hline
  Algorithm & Performance [\%]& Calc. time
  [s]\\\hline\hline
  gradient & 95 & 100\\\hline
  stochastic & 97 & 80\\\hline
  evolutionary & 99 & 500\\\hline
 \end{tabular}
\end{table}
```

refers to Table 1. For long tables, please use the `table*` environment.

6. Graphics

Encapsulated PostScript (EPS) is the preferred graphics format. It supports both vector and bitmap images. EPS images can be scaled, rotated and magnified without degrading image quality.

If the authors work with pdfLaTeX , PDF graphics can be easily generated from EPS files using the `epstopdf` LaTeX command. For example, the execution of the command

Table 1. Comparison of different methods.

Algorithm	Performance [%]	Calc. time [s]
gradient	95	100
stochastic	97	80
evolutionary	99	500

```
epstopdf image.eps
```

creates `image.pdf` graphics. (Note, however, that EPS files will still be requested for editorial reasons.)

Any text used in the images should be converted to curves, or composed using PostScript Type 1 fonts—this will ensure correct displaying of the figures in the final PDF file.

Additionaly, the provided graphics must be in gray scale—any images submitted in colour will be converted to such.

7. Equations

Equations are declared with traditional commands such as `\equation`, `\eqnarray`, etc. Each equation should be centred and numbered consecutively, starting from 1. Use arabic numbering in brackets, right justified. Please add (if appropriate) punctuation marks at the end of the formulae, e.g.,

$$J = \sum_{i=1}^{N} (e_i - y_i^s)^2. \tag{1}$$

Important! Please avoid double-column equations.

8. Theorems and other environments

The `amcs` document class offers a number of environments to declare theorems and related structures.

8.1. Theorems, corollaries, propositions and lemmas. The following piece of code:

```
\begin{theorem}{Ljung, 1971}
 Theorem definition xxxxx xxxx xxx xxx xxx
 xxx xxx xxx xxx xx xx xxxx xxx xxxxx xxxx.
 \label{theorem1}
\end{theorem}
```

results in Theorem 1, where reference to a suitable paper is given in the brackets.

Theorem 1. (Ljung, 1971) *Theorem definition xxxxx xxxx xxx xxx xxx xxx xxx xxx xx xx xxxx xxx xxxxx xxxx.*

When reference is not needed, please leave the curly brackets empty, e.g.,

```
\begin{theorem}{}
 Theorem definition xxxxx xxxx xxx xxx xxx
 xxx xxx xxx xxx xx xx xxxx xxx xxxxx xxxx.
 \label{theorem2}
\end{theorem}.
```

The result of the above is as follows:

Theorem 2. *Theorem definition xxxxx xxxx xxx xxx xxx xxx xxx xxx xxx xx xx xxxx xxx xxxxx xxxx.*

In much the same way, `lemma`, `corollary` and `proposition` environments are declared.

8.2. Proof environment. Proofs are handled by the environment

```
\begin{proof}
 Proof of theorem xxx xxx xxx xxx xxx xx xx
 xxx xxx xxx xxx xxxxx xx xx xxxx xx xx xxx
\end{proof}.
```

The Q.E.D. symbol ■ is automatically placed at the end of each proof.

Proof. Proof of theorem xxx xxx xxx xxx xxx xx xx xxx xxx xxx xxx xxxxx xx xx xxxx xx xx xxx. ■

8.3. Example environment. Examples are declared by the environment

```
\begin{example}{putsign}
 Let us consider an example ... xxx xxx xxx
 xxx xxx xx xx xxx xxx xxx xxx xxxx x xx xx
 xxxx xx xx xxx
\end{example},
```

which results in

Example 1. Let us consider an example ... xxx xxx xxx xxx xxx xx xx xxx xxx xxx xxx xxxx x xx xx xxxx xx xx xxx. ♦

If the `putsign` option is used within the curly brackets, the symbol ♦ is automatically placed at the end of each example. If this sign is not required, please leave the curly brackets empty, i.e.,

```
\begin{example}{}
 Proof of theorem xxx xxx xxx xxx xxx xx xx
 xxx xxx xxx xxx xxxxx xx xx xxxx xx xx xxx
\end{example}.
```

8.4. Definitions and remarks. Definitions are declared using the environment

```
\begin{definition}
 Proof of theorem xxx xxx xxx xxx xxx xx xx
 xxx xxx xxx xxx xxxxx xx xx xxxx xx xx xxx
\end{definition}.
```

In turn, remarks are defined using the `remark` environment:

```
\begin{remark}
 The theorem gives ....xx xxx xxx xxx xx xx
 xxx xxx xxx xxx xxxxx xx xx xxxx xx xx xxx
\end{remark}.
```

9. Acknowledgments

The acknowledgment section is created using the `acknowledgment` environment:

```
\begin{acknowledgment}
 The authors wish to thank ... xx xxx xx x
 xx xx xxx xxx xxx xxx xxxxx xx xx xxxx xx
\end{acknowledgment}.
```

Acknowledgments and other unnumbered sections have the title centered.

10. References

Authors should provide complete, correct and properly structured references. All data in the reference must be correct. Please cite the **full title** of a journal or the **full name** of a conference, not an abbreviation (e.g., not *IEEE Tran. N. Networks* but *IEEE Transactions on Neural Networks*, not *ACC 2007* but *American Control Conference 2007*). Moreover, every sign in the references counts, like commas or blank spaces in proper places.

To prepare the bibliography, the `harvard` style with the options `dcucite` and `abbr` as well as the `dcu` bibliography style should be used. Where a publication is referred to in the text, enclose the authors' names and the date of publication within brackets, see (Haykin, 1999; DAMADICS, 2004; Patan *et al*., 2008). For one author, use the author's last name and the date (Haykin, 1999; Werbos, 1974). For two authors, give both names and the date (Maryak and Chin, 2001; Parker, 1985). In the case of three or more authors, use the first author's name accompanied by "*et al.*" and the date (Reinelt *et al*., 2002; Patan and Korbicz, 2004). In a list of references, separate them using semi-colons (Haykin, 1999; Reinelt *et al*., 2002).

The list of references should be ordered alphabetically according to the first author's last name; subsequent lines have to be indented. Do not number the references. Publications by the same author(s) should be listed chronologically.

11. Biographies

The authors of accepted papers are expected to provide biographical notes, concisely describing their professional standing, achievements and interests.

Biographies are created using the `biography` environment, which supports an optional argument for the inclusion of a photo:

```
\begin{biography}[photo.eps]{Author's Name}
.
.
.
\end{biography}.
```

The photo area is 2.5cm wide and 3cm long. The author's name is a mandatory parameter and it is written in bold face. The biography should consist of one paragraph not longer than 100 words, while photo images should be prepared with 220 dpi (dots per inch) resolution, as gray scale EPS files. If a photo is not available, the `biography` environment without the optional argument should be used as follows:

```
\begin{biography}[]{Author's Name}
.
.
.
\end{biography}.
```

It should be stressed that a biography of each author of the accepted paper is required, preferably with a photo.

12. Appendices

The `appendix` environment is used to start a single appendix:

```
\begin{appendix}
 The proof of theorem ....xx xxx xxx xxx xx
 xxx xxx xxx xxx xxxxx xx xx xxxx xx xx xxx
\end{appendix}.
```

The authors can introduce more than one appendix section. In this case they should use the `appendices` environment, which uses capital letters as the numbering convention (e.g., **Appendix A**, **Appendix B**, etc.). Appendices are placed after biographies.

13. Paper notices

The paper notices section includes information about the following:

- Date of paper submission, declared with the `\Received{}` command,
- Date of paper revision, declared with the `\Revised{}` command,
- Date of paper second revision, declared with the `\Rerevised{}` command.

These commands are used solely by the editioral staff, so the authors do not have to give arguments for these commands or can even remove them from the manuscript.

Acknowledgment

The authors wish to thank ... xxx xx xx xxx xxx xxxx xxx xxx xx xxxx xxx xxx xxx xxx xxx xx xxxx xxx xxx xx xxxx xxx xxx xxx xxx xxx xx.

References

DAMADICS (2004). Website of the Research Training Network on Development and Application of Methods for Actuator Diagnosis in Industrial Control Systems, `http://diag.mchtr.pw.edu.pl/damadics`.

Haykin, S. (1999). *Neural Networks. A comprehensive foundation, 2nd Edition*, Prentice-Hall, Englewood Cliffs, NJ.

Maryak, J. and Chin, D. C. (2001). Global random optimization by simultaneous perturbation stochastic approximation, *Proceedings of the American Control Conference, ACC 2001, Arlington VA, USA*, pp. 759–762.

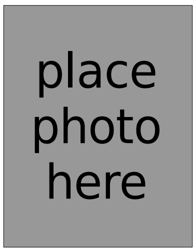
Parker, D. B. (1985). Learning logic, *Technical Report TR-47*, Center for Computational Reasearch in Economics and Management Science, Massachusetts Institute of Technology, Cambridge, MA.

Patan, K. and Korbicz, J. (2004). Artificial neural networks in fault diagnosis, *in* J. Korbicz, J. M. Kościelny, Z. Kowalczuk and W. Cholewa (Eds), *Fault Diagnosis. Models, Artificial Intelligence, Applications*, Springer-Verlag, Berlin, pp. 330–380.

Patan, K., Witczak, M. and Korbicz, J. (2008). Towards robustness in neural network based fault diagnosis, *International Journal of Applied Mathematics and Computer Science* **18**(4): 443–454. DOI: 10.2478/v10006-008-0039-2.

Reinelt, W., Garulli, A. and Ljung, L. (2002). Comparing different approaches to model error modeling in robust identification, *Automatica* **38**(5): 787–803.

Werbos, P. J. (1974). *Beyond Regression: New Tools for Prediction and Analysis in the Behavioral Sciences*, PhD thesis, Harvard University, Harvard.



Author with a photo. Place a brief biography here xxx xxx xxxxx xx xxx xxx xxx xx xxxx xx xxxxxxx xxx xxx xx xx xx xxxxx xx xxxx xxx xxx xxxxx xx xxx xxx xxx xx xxxx xx xxxxxxx xxx xxx xx xx xx xxxxx xx xxxx xxx xxx xxxxx xx xxx xxx xxx xx xxxx xx xxxxxxx xxx xxx xx xx xx xxxxx xx xxxx xxx xxx xxxxx xx xxx xxx xxx xx xxxx xx xxxxxxx xxx xxx xx xx xx xxxxx xx xxxx xxx xxx xxxxx xx xxx xxx xxx xx xxxx xx xxxxxxx xxx xxx xx xx xx xxxxx xx xxxx xxx xxx xxxxx xx xxx xxx xxx xx xxxx xx xxxxxxx xxx xxx xx xx xx xxxxx xx xxxx xxx xxx xxxxx xx xxx xxx xxx xx xxxx xx xxxxxxx xxx xxx xx xx xx xxxxx xx xxxx.

Author without a photo. Place a brief biography here xxx xxx xxxxx xx xxx xxx xxx xx xxxx xx xxxxxxx xxx xxx xx xx xx xxxxx xx xxxx xxx xxx xxxxx xx xxx xxx xxx xx xxxx xx xxxxxxx xxx xxx xx xx xx xxxxx xx xxxx xxx xxx xxxxx xx xxx xxx xxx xx xxxx xx xxxxxxx xxx xxx xx xx xx xxxxx xx xxxx xxx xxx xxxxx xx xxx xxx xxx xx xxxx xx xxxxxxx xxx xxx xx xx xx xxxxx xx xxxx xxx xxx xxxxx xx xxx xxx xxx xx xxxx xx xxxxxxx xxx xxx xx xx xx xxxxx xx xxxx xxx xxx xxxxx xx xxx xxx xxx xx xxxx xx xxxxxxx xxx xxx xx xx xx xxxxx xx xxxx xxx xxx xxxxx xx xxx xxx xxx xx xxxx xx xxxxxxx xxx xxx xx xx xx xxxxx xx xxxx.

Appendix A

The proof of Theorem 1 xx xxx xxx xxx xx xx xxx xxx xxx xxx xxxxx xx xx xxxx xx xx xxx xx xxx xxx xxx xx xx xxx xxx xxx xxx xxxxx xx xx xxxx xx xx xxx.

Appendix B

The proof of Theorem 2 xx xxx xxx xxx xx xx xxx xxx xxx xxx xxxxx xx xx xxxx xx xx xxx xx xxx xxx xxx xx xx xxx xxx xxx xxx xxxxx xx xx xxxx xx xx xxx.

Received: