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A framework for uncertainty quantification in geotechnical engineering

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This study describes a framework for ...

KEYWORDS: uncertainty quantification; surrogate modelling; geotechnical problem; high dimensions

INTRODUCTION

Many authors submitting to research journals use LaTeX 2ε to prepare their papers. This paper describes the GeotechAuth.cls class file which can be used to convert articles produced with other LaTeX 2ε class files into the correct form for publication in *Géotechnique*.

The GeotechAuth.cls class file preserves much of the standard LaTeX 2ε interface so that any document which was produced using the standard LaTeX 2ε article style can easily be converted to work with the GeotechAuth style. However, the width of text and typesize will vary from that of article.cls; therefore, *line breaks will change* and it is likely that displayed mathematics and tabular material will need re-setting.

In the following sections we describe how to lay out your code to use GeotechAuth.cls to reproduce the typographical look of *Géotechnique*. However, this paper is not a guide to using LaTeX 2ε and we would refer you to any of the many books available (see, for example, Kopka & Daly (2003), Lamport (1994) and Mittelbach & Goossens (2004)).

Important note

You will find links to the Author Guidelines and other resources to help you prepare your paper for publication at:
`http://www.icevirtuallibrary.com/authors/publish?contentType=journals`

THE THREE GOLDEN RULES

Before we proceed, we would like to stress *three golden rules* that need to be followed to enable the most efficient use of your code at the typesetting stage:

(i) keep your own macros to an absolute minimum;
(ii) as TeX is designed to make sensible spacing decisions by itself, do *not* use explicit horizontal or vertical spacing commands, except in a few accepted (mostly mathematical) situations, such as `\,` before a differential d, or `\quad` to separate an equation from its qualifier;
(iii) follow the *Géotechnique* reference style.

GETTING STARTED

The GeotechAuth class file should run on any standard LaTeX 2ε installation. If any of the fonts, style files or packages it requires are missing from your installation, they can be found on the *TeX Collection* DVDs or from CTAN.

Géotechnique is published using Times fonts and this is achieved by using the `times` option as
`\documentclass[times]{GeotechAuth}`.
If for any reason you have a problem using Times you can easily resort to Computer Modern fonts by removing the `times` option.

THE ARTICLE HEADER INFORMATION

The heading for any file using GeotechAuth.cls is shown in Figure 1.

Remarks

(i) In `\runningheads` use '*et al.*' if there are three or more authors.
(ii) For multiple author papers please note the use of `\addressnum` to link names and addresses.
(iii) For submitting a double-spaced manuscript, add `doublespace` as an option to the documentclass line.
(iv) The abstract should be capable of standing by itself, in the absence of the body of the article and of the bibliography. Therefore, it must not contain any reference citations.
(v) Supply a maximum of six keywords from the Géotechnique list:
`http://www.icevirtuallibrary.com/upload/geotechniquekeywords.pdf`.
Keywords are separated by semicolons.

THE BODY OF THE ARTICLE

Mathematics

GeotechAuth.cls makes the full functionality of $\mathcal{A}\mathcal{M}\mathcal{S}$TeX available. We encourage the use of the `align`, `gather` and `multline` environments for displayed mathematics.

Figures and tables

GeotechAuth.cls includes the graphicx package for handling figures.

Figures are called in as follows:

```
\begin{figure}
\centering
\includegraphics{<figure name>}
\caption{<Figure caption>}
\end{figure}
```

For further details on how to size figures, etc., with the graphicx package see, for example, Kopka & Daly (2003) or Mittelbach & Goossens (2004).

The standard coding for a table is shown in Figure 2. Please note that GeotechAuth.cls includes the tabls package to help improve table spacing.

Manuscript to be submitted...
*Department of Civil and Environmental Engineering, Imperial College London, London, UK (orcid:0000-0001-7031-2307)
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```
\documentclass[times]{GeotechAuth}
%\documentclass[times,doublespace]{GeotechAuth}%For submission

\begin{document}

\runningheads{<Short title>}{<Initials and Surnames>}

\title{<Your title>}

\author{<A. Author\addressnum{1}, S. Else\addressnum{2} \authorand
P. Another\addressnum{1}>}

\address{<\addressnum{1}First author's full postal address
(in this example it is the same as the third author)\\
\addressnum{2}Second author's full postal address>}

\begin{abstract}
<Text>
\end{abstract}

\keywords{<List keywords>}

\maketitle

\section{Introduction}
.
.
.
```

Fig. 1. Example header text

```
\begin{table}
\caption{<Table caption>}
\small
\centering
\begin{tabular}{<table alignment>}
   %with "|" between columns
\hline
<column headings>\\
\hline
<table entries
(separated by & as usual)>\\
<table entries>\\
.
.
.\\
\hline
\end{tabular}
\end{table}
```

Fig. 2. Example table layout

Cross-referencing
The use of the LaTeX cross-reference system for figures, tables, equations, etc., is encouraged (using `\ref{<name>}` and `\label{<name>}`).

Bibliography
Please note that the file Geotech.bst is available from the same download page for those authors using BibTeX.

Otherwise, the normal commands for producing the reference list are:

```
\begin{thebibliography}{99}
\item <Reference details>
.
.
.
\item <Reference details>
\end{thebibliography}
```

Double spacing
If you need to double space your document for submission please use the `doublespace` option as shown in the sample layout in Figure 1.

ACKNOWLEDGEMENTS

This class file was developed by Sunrise Setting Ltd, Paignton, Devon, UK. Website:
`http://www.sunrise-setting.co.uk`

REFERENCES

Kopka, H. & Daly, P.W. (2003). *A guide to LaTeX*, 4th edn. Addison-Wesley.

Lamport, L. (1994). *LaTeX: a document preparation system*, 2nd edn. Addison-Wesley.

Mittelbach, F. & Goossens, M. (2004). *The LaTeX companion*, 2nd edn. Addison-Wesley.