


Indoor Lighting System Design Considering Reflections

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Abstract

The paper deals with problems about genetic algorithm solution of indoor luminaire placement. The multiple reflections from walls must be taken into account in contrast to outdoor illuminance calculation. Therefore the basic calculation of the reflection was proposed and the genetic algorithm was as a script in software MATLAB tested on a model room. It appeared that the requirements described in standards do not restrict the solutions of the luminaire placement to much. Therefore the standards requirements are met by several solutions. The best one is always chosen by designers preferences. It is quite a big deal to involve the preferences in the algorithmic solution, but some methods, how it can be done, are also presented in the paper.

Keywords

Genetic Algorithm, Lighting, Design, Illuminance

Introduction

Many authors submitting to research journals use $\text{\LaTeX 2}_{\epsilon}$ to prepare their papers. This paper describes the `sagej.cls` class file which can be used to convert articles produced with other $\text{\LaTeX 2}_{\epsilon}$ class files into the correct form for submission to *SAGE Publications*.

The `sagej.cls` class file preserves much of the standard $\text{\LaTeX 2}_{\epsilon}$ interface so that any document which was produced using the standard $\text{\LaTeX 2}_{\epsilon}$ article style can easily be converted to work with the `sagej` 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 `sagej.cls` to reproduce much of the typographical look of the *SAGE* journal that you wish to submit to. However, this paper is not a guide to using $\text{\LaTeX 2}_{\epsilon}$ and we would refer you to any of the many books available (see, for example, [Kopka and Daly \(2003\)](#), [Lamport \(1994\)](#) and [Mittelbach and Goossens \(2004\)](#)).

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 journal reference style.

Getting started

The `sagej` class file should run on any standard $\text{\LaTeX 2}_{\epsilon}$ 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 downloaded from CTAN.

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```

\documentclass[<options>]{sagej}

\begin{document}

\runninghead{<Author surnames>}

\title{<Initial capital only>}

\author{<An Author\affilnum{1},
Someone Else\affilnum{2} and
Perhaps Another\affilnum{1}>}

\affiliation{<\affilnum{1}First and third authors' affiliation\\
\affilnum{2}Second author affiliation>}

\corrauth{<Corresponding author's name and full postal address>}

\email{<Corresponding author's email address>}

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

\keywords{<List keywords>}

\maketitle

\section{Introduction}
.
.
.

```

Figure 1. Example header text.

The article header information

The heading for any file using `sagej.cls` is shown in Figure 1. You must select options for the trim/text area and the reference style of the journal you are submitting to. The choice of options are listed in Table 1.

Table 1. The choice of options.

Option	Trim	Columns
shortAfour	210 × 280 mm	Double column
Afour	210 × 297 mm	Double column
MCfour	189 × 246 mm	Double column
PCfour	170 × 242 mm	Double column
Royal	156 × 234 mm	Single column
Crown	7.25 × 9.5 in	Single column

Option	Reference style
sageh	SAGE Harvard style (author-year)
sagev	SAGE Vancouver style (superscript numbers)
sageapa	APA style (author-year)

For example, if your journal is short A4 sized, uses Times fonts and has Harvard style references then you would need

```
\documentclass[ShortAfour,times,sageh]{sagej}
```

Most *SAGE* journals are published using Times fonts but if for any reason you have a problem using Times you can easily resort to Computer Modern fonts by removing the `times` option.

Remarks

- (i) In `\runninghead` use '*et al.*' if there are three or more authors.
- (ii) For multiple author papers please note the use of `\affilnum` to link names and affiliations. The corresponding author details need to be included using the `\corrauth` and `\email` commands.
- (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) Keywords are separated by commas.

```

\begin{table}
\small\sf\centering
\caption{<Table caption.>}
\begin{tabular}{<table alignment>}
\toprule
<column headings>\\
\midrule
<table entries
(separated by & as usual)>\\
<table entries>\\
.
.
.\
\bottomrule
\end{tabular}
\end{table}

```

Cross-referencing

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

Figure 2. Example table layout.

- (vi) If you are submitting to a *SAGE* journal that requires numbered sections (for example, *IJRR*), please add the command `\setcounter{secnumdepth}{3}` just above the `\begin{document}` line.

The body of the article

Mathematics

`sagej.cls` makes the full functionality of $\mathcal{A}\mathcal{M}\mathcal{S}\mathcal{T}\mathcal{E}\mathcal{X}$ available. We encourage the use of the `align`, `gather` and `multline` environments for displayed mathematics. `amsthm` is used for setting theorem-like and proof environments. The usual `\newtheorem` command needs to be used to set up the environments for your particular document.

Figures and tables

`sagej.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}

```

End of paper special sections

For further details on how to size figures, etc., with the `graphicx` package see, for example, [Kopka and Daly \(2003\)](#) or [Mittelbach and Goossens \(2004\)](#).

The standard coding for a table is shown in [Figure 2](#).

Depending on the requirements of the journal that you are submitting to, there are macros defined to typeset various special sections.

The commands available are:

```
\begin{acks}
To typeset an
  "Acknowledgements" section.
\end{acks}

\begin{biog}
To typeset an
  "Author biography" section.
\end{biog}

\begin{biogs}
To typeset an
  "Author Biographies" section.
\end{biogs}

\begin{dci}
To typeset a "Declaration of
  conflicting interests" section.
\end{dci}

\begin{funding}
To typeset a "Funding" section.
\end{funding}

\begin{sm}
To typeset a
  "Supplemental material" section.
\end{sm}
```

Endnotes

Most *SAGE* journals use endnotes rather than footnotes, so any notes should be coded as `\endnote{<Text>}`. Place the command `\theendnotes` just above the Reference section to typeset the endnotes.

To avoid any confusion for papers that use Vancouver style references, footnotes/endnotes should be edited into the text.

References

Please note that the files `SageH.bst` and `SageV.bst` are included with the class file for those authors using `BIBTEX`. For APA style references please use `mslapa.bst` which should be part of most modern `TEX` distributions.

See the above instructions regarding choosing the correct reference option.

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Acknowledgements

This class file was developed by Sunrise Setting Ltd, Paignton, Devon, UK. Website:

<http://www.sunrise-setting.co.uk>

References

- Kopka H and Daly PW (2003) *A Guide to L^AT_EX*, 4th edn. Addison-Wesley.
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