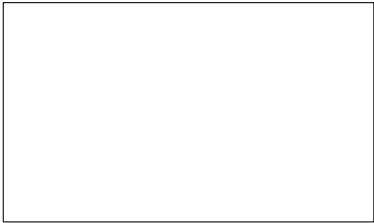


Graphical Abstract

This is a specimen a_b title

J.K. Krishnan, Han Thane, William J. Hansen, T. Rafeeq



Highlights

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- Research highlights item 1
- Research highlights item 2
- Research highlights item 3

This is a specimen a_b title^{*,**}

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ABSTRACT

The advancement and ubiquity of digital networks have fundamentally transformed numerous spheres of human activity. At the heart of this phenomenon, lies the Transmission Control Protocol (TCP) model, whose influence is particularly notable in the exponential growth of the Internet due to its ability to transmit flexibly to any device, through its advanced Congestion Control (CC). Seeking an even more efficient CC mechanism, this work proposes the construction of deep learning neural networks (MLP, LSTM, and CNN) for classifying the level of network congestion. The results attest to models capable of distinguishing, with over 90% accuracy, between moments of high and low degrees of congestion. With this, it becomes possible to differentiate between congestion and random losses, potentially increasing throughput by up to five times in environments with random losses when combined with CC algorithms.

`\beginabstract ... \endabstract` and `\begin{keyword} ... \end{keyword}` which contain the abstract and keywords respectively. Each keyword shall be separated by a `\sep` command.

1. Introduction

The Elsevier cas-sc class is based on the standard article class and supports almost all of the functionality of that class. In addition, it features commands and options to format the

- document style
- baselineskip
- front matter
- keywords and MSC codes
- theorems, definitions and proofs
- lables of enumerations
- citation style and labeling.

This class depends on the following packages for its proper functioning:


*This document is the results of the research project funded by the National Science Foundation.

**The second title footnote which is a longer text matter to fill through the whole text width and overflow into another line in the footnotes area of the first page.

This note has no numbers. In this work we demonstrate a_b the formation Y_1 of a new type of polariton on the interface between a cuprous oxide slab and a polystyrene micro-sphere placed on the slab.

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¹This is the first author footnote, but is common to third author as well.

²Another author footnote, this is a very long footnote and it should be a really long footnote. But this footnote is not yet sufficiently long enough to make two lines of footnote text.

1. natbib.sty for citation processing;
2. geometry.sty for margin settings;
3. fleqn.clo for left aligned equations;
4. graphicx.sty for graphics inclusion;
5. hyperref.sty optional packages if hyperlinking is required in the document;

All the above packages are part of any standard L^AT_EX installation. Therefore, the users need not be bothered about downloading any extra packages.

2. Installation

The package is available at author resources page at Elsevier (<http://www.elsevier.com/locate/latex>). The class may be moved or copied to a place, usually, \$TEXMF/tex/latex/elsevier/, or a folder which will be read by L^AT_EX during document compilation. The T_EX file database needs update after moving/copying class file. Usually, we use commands like mktexlsr or texhash depending upon the distribution and operating system.

3. Front matter

The author names and affiliations could be formatted in two ways:

- (1) Group the authors per affiliation.
- (2) Use footnotes to indicate the affiliations.

See the front matter of this document for examples. You are recommended to conform your choice to the journal you are submitting to.

4. Bibliography styles

There are various bibliography styles available. You can select the style of your choice in the preamble of this document. These styles are Elsevier styles based on standard styles like Harvard and Vancouver. Please use BibT_EX to generate your bibliography and include DOIs whenever available.

Here are two sample references: See Fortunato (2010). Also refer Fortunato (2010); Newman and Girvan (2004). More citations are here (Fortunato, 2010; Vehlow, Reinhardt and Weiskopf, 2013).

5. Floats

Figures may be included using the command, \includegraphics in combination with or without its several options to further control graphic. \includegraphics is provided by graphic[s,x].sty which is part of any standard L^AT_EX distribution. graphicx.sty is loaded by default. L^AT_EX accepts figures in the postscript format while pdfL^AT_EX accepts *.pdf, *.mps (metapost), *.jpg and *.png formats. pdfL^AT_EX does not accept graphic files in the postscript format.

The table environment is handy for marking up tabular material. If users want to use multirow.sty, array.sty, etc., to fine control/enhance the tables, they are welcome to load any package of their choice and cas-sc.cls will work in combination with all loaded packages.

Table 1

This is a test caption. This is a test caption. This is a test caption. This is a test caption.

Col 1	Col 2	Col 3	Col4
12345	12345	123	12345
12345	12345	123	12345
12345	12345	123	12345
12345	12345	123	12345
12345	12345	123	12345



Figure 1: The beauty of Munnar, Kerala. (See also Table 1).

6. Theorem and theorem like environments

cas-sc.cls provides a few shortcuts to format theorems and theorem-like environments with ease. In all commands the options that are used with the `\newtheorem` command will work exactly in the same manner. cas-sc.cls provides three commands to format theorem or theorem-like environments:

```
\newtheorem{theorem}{Theorem}
\newtheorem{lemma}[theorem]{Lemma}
\newdefinition{rmk}{Remark}
\newproof{pf}{Proof}
\newproof{pot}{Proof of Theorem \ref{thm2}}
```

The `\newtheorem` command formats a theorem in L^AT_EX's default style with italicized font, bold font for theorem heading and theorem number at the right hand side of the theorem heading. It also optionally accepts an argument which will be printed as an extra heading in parentheses.

```
\begin{theorem}
  For system (8), consensus can be achieved with
   $\|T_{\omega z}\| \dots$ 
  \begin{eqnarray}\label{10}
    \dots
  \end{eqnarray}
\end{theorem}
```

Theorem 1. *For system (8), consensus can be achieved with $\|T_{\omega z}\| \dots$*

....

(1)

The `\newdefinition` command is the same in all respects as its `\newtheorem` counterpart except that the font shape is roman instead of italic. Both `\newdefinition` and `\newtheorem` commands automatically define counters for the environments defined.

The `\newproof` command defines proof environments with upright font shape. No counters are defined.

7. Enumerated and Itemized Lists

cas-sc.cls provides an extended list processing macros which makes the usage a bit more user friendly than the default L^AT_EX list macros. With an optional argument to the `\begin{enumerate}` command, you can change the list counter type and its attributes.

```
\begin{enumerate}[1.]
\item The enumerate environment starts with an optional
      argument '1.', so that the item counter will be suffixed
      by a period.
\item You can use 'a)' for alphabetical counter and '(i)' for
      roman counter.
\begin{enumerate}[a]
  \item Another level of list with alphabetical counter.
  \item One more item before we start another.
  \item One more item before we start another.
  \item One more item before we start another.
  \item One more item before we start another.
```

Further, the enhanced list environment allows one to prefix a string like 'step' to all the item numbers.

```
\begin{enumerate}[Step 1.]
\item This is the first step of the example list.
\item Obviously this is the second step.
\item The final step to wind up this example.
\end{enumerate}
```

8. Cross-references

In electronic publications, articles may be internally hyperlinked. Hyperlinks are generated from proper cross-references in the article. For example, the words Fig. 1 will never be more than simple text, whereas the proper cross-reference `\ref{tiger}` may be turned into a hyperlink to the figure itself: [Fig. 1](#). In the same way, the words [Ref. \[1\]](#) will fail to turn into a hyperlink; the proper cross-reference is `\cite{Knuth96}`. Cross-referencing is possible in L^AT_EX for sections, subsections, formulae, figures, tables, and literature references.

9. Bibliography

Two bibliographic style files (*.bst) are provided — `modell-num-names.bst` and `model2-names.bst` — the first one can be used for the numbered scheme. This can also be used for the numbered with new options of `natbib.sty`. The second one is for the author year scheme. When you use `model2-names.bst`, the citation commands will be like `\citep`, `\citet`, `\citealt` etc. However when you use `modell-num-names.bst`, you may use only `\cite` command.

the `bibliography` environment. Each reference is a `\bibitem` and each `\bibitem` is identified by a label, by which it can be cited in the text:

In connection with cross-referencing and possible future hyperlinking it is not a good idea to collect more than one literature item in one `\bibitem`. The so-called Harvard or author-year style of referencing is enabled by the L^AT_EX package `natbib`. With this package the literature can be cited as follows:

- Parenthetical: `\citep{WB96}` produces (Wettig & Brown, 1996).
- Textual: `\citet{ESG96}` produces Elson et al. (1996).
- An affix and part of a reference: `\citep[e.g.] [Ch. 2]{Gee97}` produces (e.g. Governato et al., 1997, Ch. 2).

In the numbered scheme of citation, `\cite{<label>}` is used, since `\citep` or `\citet` has no relevance in the numbered scheme. `natbib` package is loaded by `cas-sc` with `numbers` as default option. You can change this to author-year or harvard scheme by adding option `authoryear` in the class loading command. If you want to use more options of the `natbib` package, you can do so with the `\biboptions` command. For details of various options of the `natbib` package, please take a look at the `natbib` documentation, which is part of any standard L^AT_EX installation.

A. My Appendix

Appendix sections are coded under \appendix.

`\printcredits` command is used after appendix sections to list author credit taxonomy contribution roles tagged using `\credit` in frontmatter.

CRediT authorship contribution statement

J.K. Krishnan: Conceptualization of this study, Methodology, Software. **William J. Hansen:** Data curation, Writing - Original draft preparation.

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