Stream analysis of incoming events using different data analysis methods in Proceedings of IIT.SRC 2017

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Abstract. All IIT.SRC LaTeX contributions are expected to use the `iitsrc` class. This document was typeset with that class and as such it is solely a demo. It is a supplement to the `iitsrc.pdf` document which describes all the (boring) things in detail.[1]

1 Basics

We do not hope to give you as extensive information as other sources (such as [7]). On Linux you can get fairly complete information about LaTeX commands via:

```
info latex
```

Here we only make few notes concerning obvious things you probably already know. You should properly divide your text into several sections (via `\section` and perhaps also `\subsection` commands). Do not change the font family and font sizes defined by the `iitsrc` class. These default values should be common for all articles. If you want to emphasize something (perhaps a newly introduced notion or such), use the `\em` command. Usage of the bold face (the `\bf` command) is very unusual in normal LaTeX text. It is not advised to use it explicitly. End of a paragraph is indicated in the source code by an empty line. You can use usual environments such as `itemize` or `enumerate` to create bulleted or enumerated lists.

2 Mathematical formulæ, equations, figures and tables

The `equation` environment can be used for typesetting numbered equations.

$$e^{i\pi} + 1 = 0 \tag{1}$$

It was produced with a following commands:

```
\begin{equation}
e^{i\pi}+1=0
\end{equation}
```

If you want later to refer to your equation, it is wise to accompany your equation with a symbolic label, for example as below:

```
\begin{equation}
\label{eq:contestwinner}
e^{i\pi}+1=0
\end{equation}
```

Now you can refer to it—the Equation 1—by its symbolical name rather than a concrete number. This is advantageous because the order of equations might change over time. This reference can be typeset as follows:

```
Equation~\ref{eq:contestwinner}
```

There is also `equation*` environment which enables you to typeset unnumbered equation.

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[1] Abstract should be no longer than 100 words.

There are also other useful LATEX commands and environments such as eqnarray. For example:

$$x \quad \ll \quad y_1 + \cdots + y_n \qquad (2)$$
$$x \quad \leq \quad z \qquad (3)$$

It enables you to put (non-)equalities nicely one below the other pleasantly aligned. The above example was typeset by a following command:

```
\begin{eqnarray}
x & \ll & y_1 + \cdots + y_n\\
x & \leq & z
\end{eqnarray}
```

If you need to typeset a table such as Table 1 you can do it as follows:

Table 1. Specification of a strategy $s(a)$ of agent a.

|	penalty of agent a	penalty of agent b	movement of agent a
1	$p(a) = 0$	$p(b) = 0$	$S_1(a)$
2	$p(a) = 0$	$p(b) > 0$	$S_2(a)$
3	$p(a) > 0$	$p(b) = 0$	$S_3(a)$
4	$p(a) > 0$	$p(b) > 0$	$S_4(a)$

```
\begin{table}[H]
\centering
    \caption{Specification of a
        strategy $s(a)$ of agent
        $a$.}
    \label{tab:strategy}
        \begin{tabular}{|c|ccc|}
        \hline
        & penalty & penalty &
            movement\\
        & of agent $a$ & of agent
            $b$ & of agent $a$\\
        \hline
        1 & $p(a)=0$ & $p(b)=0$ &
            $S_1(a)$\\
        2 & $p(a)=0$ & $p(b)>0$ &
            $S_2(a)$\\
        3 & $p(a)>0$ & $p(b)=0$ &
            $S_3(a)$\\
        4 & $p(a)>0$ & $p(b)>0$ &
            $S_4(a)$\\
        \hline
    \end{tabular}
\end{table}
```

If you need to use full-page tables, such as Table 2, you can do this as follows:

```
\begin{table*}[bp]
\centering
```

```
    \caption{Please use full-page
        tables only if necessary.}
    \label{tab:strategy2}
        \begin{tabularx}{12.6cm}{|C|
            CCC|}
        \hline
        & penalty & penalty &
            movement\\
        & of agent $a$ & of agent
            $b$ & of agent $a$\\
        \hline
        1 & $p(a)=0$ & $p(b)=0$ &
            $S_1(a)$\\
        2 & $p(a)=0$ & $p(b)>0$ &
            $S_2(a)$\\
        3 & $p(a)>0$ & $p(b)=0$ &
            $S_3(a)$\\
        4 & $p(a)>0$ & $p(b)>0$ &
            $S_4(a)$\\
        \hline
    \end{tabularx}
\end{table*}
```

If you need to include a figure to your document, such as Figure 1,
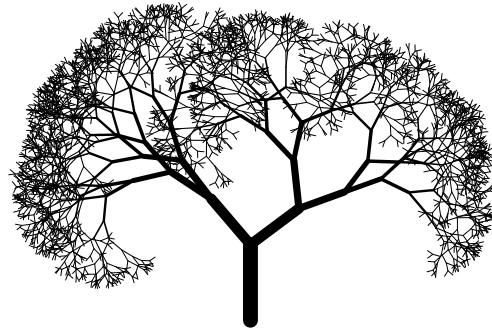
Figure 1. Sample output of a fractal tree drawing algorithm.

you can do it as follows:

```
\begin{figure}[H]
\begin{center}
    \includegraphics{tree}
    \caption{Sample output of a
        fractal tree drawing
        algorithm.}
    \label{fig:fractaltree}
\end{center}
\end{figure}
```

If you need to include a full-page figure to your document, such as Figure 2, you can do it as follows:
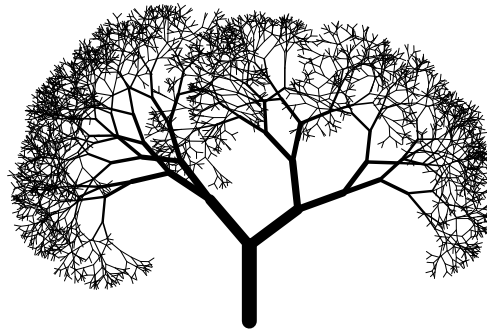
```
\begin{figure*}[t]
```

Figure 2. Please use full-page images only if necessary.

```
\begin{center}
    \includegraphics{tree}
    \caption{Please use full-
        page images only if
        necessary.}
    \label{fig:fractaltree2}
\end{center}
\end{figure*}
```

If you process your document with LATEX you will have to provide all your figures as EPS (Encapsulated Postscript) files. If you process your document with PDFLATEX you will have to provide all your figures as PDF files. Several graphical programs are able to export pictures to these two formats. If possible, please use a vector editor. Please do not convert bitmaps into EPS or PDF. The printed results are then usually ugly.

Note that since you have given a figure a symbolic name (in this case `fig:fractaltree`), you can refer to this figure as follows:

```
Figure~\ref{fig:fractaltree}
```

This is advantageous because regardless of the fact how you reorder your figures in the document, the references to them will never break unless you change their symbolical name. Do not forget to describe your figure with a `\caption` command. Due to technological constraints, included figures should be

- black-and-white,
- minimal thickness of lines should be at least 0.25 mm,

- do not use half-tones; use raster instead to express various degrees of gray.

If you need to insert a pseudo code of an algorithm into the paper, you can use the algorithms package for LATEX. Documentation and example in TEX file can be found in the zip file available on `http://texcatalogue.sarovar.org/entries/algorithms.html`. Please do not refer to various parts of your document via page numbers. Instead, give a symbolic name to your sections (via `\label` command) and refer to your sections via `\ref` command. Please leave the `\editpages` command from a "minimal article source code" in place. Its purpose is related to combining particular articles to a single volume and if you delete it, someone will have later add it back. So if you leave it where it is, you will save yours someone else's time.

3   The bibliography

LATEX document usually creates bibliography references via BIBTEX. Basic information about BIBTEX is in [7]. You are encouraged to use it too. Bibliography references are usually inserted in the document as follows:

```
\bibliography{common}
\bibliographystyle{iitsrc}
```

Be sure to use the `iitsrc` style as suggested above. We used BIBTEX also for typesetting bibliographic references cited within this document. So you can look

Table 2. Please use full-page tables only if necessary.

	penalty of agent a	penalty of agent b	movement of agent a
1	$p(a) = 0$	$p(b) = 0$	$S_1(a)$
2	$p(a) = 0$	$p(b) > 0$	$S_2(a)$
3	$p(a) > 0$	$p(b) = 0$	$S_3(a)$
4	$p(a) > 0$	$p(b) > 0$	$S_4(a)$

at the source code (`demo.tex`) and the compilation instructions (`Makefile`) to see how it was generated. The `common.bib` file contains the bibligraphy resources we collected over time. There are various entries in the form:

```
@ARTICLE{OwickiGries76b,
    AUTHOR = {S. Owicki and D.
        Gries},
    TITLE = "Verifying Properties
        of Parallel Programs,
          an axiomatic approach
                ",
    JOURNAL = cacm,
    VOLUME = 19,
    NUMBER = 5,
    PAGES = {279-285},
    MONTH = may,
    YEAR = 1976
}
```

Each such entry contains logical information about the particular source of information. You can add your sources of information therein. Some information about how to do that can be found in [7] (Appendix B). BIBTEX finds out which ones you cite within your document and format the data it finds in your `*.bib` (in this case `common.bib`) file according to the instructions in the `*.bst` (in this case `iitsrc.bst`) file. All you have to do within your document is to `\cite{key}` them.

Other example cited sources: [1–6, 8–14]

– Item 1
– Item 2
  ○ Item 2.1
    ■ Item 2.1.1
    ■ Item 2.1.2
    ■ Item 2.1.3
– Item 3

A numbered list should be formatted as follows:

1. Item
   a. Item
      i. Item

References

[1] ISO/IEC 9899:TC2 Committee Draft, 2005.

[2] Caromel, D., Henrio, L., Serpette, B.: Asynchronous Sequential Processes. Technical report, INRIA Sophia Antipolis, 2003, RR-4753.

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[5] Henessy, J., Patterson, D.: *Computer Organization and Design: The Hardware/Software Inteface*. Morgan Kaufmann Publishers, San Mateo California, 1994.

[6] Henrio, L.: *Asynchronous Object Calculus: Confluence and Determinacy*. PhD thesis, Université de Nice-Sophia Antipolis, 2003.

[7] Lamport, L.: *A Document Preparation System LATEX, User's Guide and Reference Manual*. Addison Wesley, 1986.

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[9] Manna, Z., Pnueli, A.: Verification of concurrent programs: a temporal proof system. In: *Proceedings of the Fourth School on Advanced Programming*, Amsterdam, 1982, pp. 163–255.

[10] Misra, J., Chandy, K.: Proofs of networks of processes. *IEEE Transactions on Software Engineering*, 1981, vol. 7, no. 7, pp. 417–426.

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[13] Vardhan, A., et al.: Distributed Garbage Collection of Active Objects: A Transformation And Its Applications to Java Programming. Master's thesis, 1998.

[14] Widom, J., Panangaden, P.: Expressiveness Bounds for Completeness in Trace-Based Network Proof Systems. In: *CAAP '88: Proceedings of the 13th Colloquium on Trees in Algebra and Programming, Lecture Notes in Computer Science 209*. Springer-Verlag, Berlin, 1988, pp. 200–214.