

Sample L^AT_EX Document

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Abstract—This document briefly describes how to write a technical report using L^AT_EX. It is certainly not a comprehensive description of either good technical writing or L^AT_EX. The former topic is covered very well in [1] and the latter in [2].

I. INTRODUCTION

This is the introduction to your report. In this section you will tell the reader what you are going to say in the body. If it is a long report, you might even sketch out what you will say, section by section. Generally you will write the introduction and conclusions *after* the body.

II. THE BODY—BACKGROUND AND NOTATION

Here you will discuss your findings. You will probably have multiple sections. The first section will usually describe the *general* problem you are addressing, giving the reader some background and context for the coming sections. You should also list any notation that is unusual or new.

Somewhere in this section you should probably include the following Equation 1. You can always refer back to it by using the notation

`\ref{equation1}`

$$A = U\Sigma V^T \quad (1)$$

where A is m -by- n with singular values $\sigma_1 \geq \sigma_2 \geq \dots \geq \sigma_n \geq 0$, U and V are orthogonal matrices and $\Sigma = \text{diag}(\sigma_1, \sigma_2 \geq \dots, \sigma_n)$.

III. THE BODY—PROBLEM SETUP AND SOLUTION

Once you have the background material complete, you should set up the problem you are solving and discuss what particular issues you are studying. In the case of the LSI project, you should discuss what *specific* questions you will address and how you will find the answers.

Somewhere in this section you should probably include the following Equation 2:

$$A_k = U_k \Sigma_k V_k^T \quad (2)$$

where A_k is an m -by- n matrix of rank k with singular values $\sigma_1 \geq \sigma_2 \geq \dots \geq \sigma_k \geq 0$, U_k and V_k are the first k columns of U and V , respectively, from Equation 1, and $\Sigma_k = \text{diag}(\sigma_1, \sigma_2 \geq \dots, \sigma_k)$.

IV. THE BODY—COMPUTATIONAL RESULTS

In this section you should present your computational results and tell the reader your findings based on these results. Be very specific here. Also, the use of tables is a great idea in this section (as well as in other places) so you might put in something like this:

V. FIGURES

	Value of k in Equation 2.				
<i>Term-Doc Matrix</i>	4	8	16	32	64
CRAN	8	10	12	14	16
CISI	9	11	13	15	17

TABLE I
NUMBER OF DOCUMENTS RETURNED AS A FUNCTION OF k FOR EACH OF THE TERM-DOCUMENT MATRICES.

Inserting figures into L^AT_EX documents can be complicated. One strategy (which is a good general strategy for working with L^AT_EX documents) is to refer to existing documents as templates for specific types of constructs. For example, you can refer back to this document to see how Figure 1 is expressed in L^AT_EX source code. Web searches are also an excellent resource for getting detailed information about L^AT_EX strategies. You don't have to struggle alone in trying to get L^AT_EX to work!



Fig. 1. This figure is drawn from a PDF file that was included, scaled and inserted into wrapped text. Use the L^AT_EX source as a starting point for inserting your own figures.

```
\begin{wrapfigure}{r}{0.25\textwidth}
\centering
\includegraphics[scale=0.1]{LaTeX_Lion.pdf}
\caption{\footnotesize This figure is drawn
from a PDF file that was included, scaled
and inserted into wrapped text. Use the
\LaTeX\ source as a starting point for
inserting your own figures.}
\label{fig1}
\end{wrapfigure}
```

Fig. 2. The L^AT_EX source shown in this figure was used to generate Figure 1. Note that L^AT_EX places figures for you. You do not have direct control over figure placement, but can “coach” L^AT_EX when you get some experience behind you.

Figure 2 shows the L^AT_EX source that generated Figure 1.

VI. THE CONCLUSION

Here you will synthesize what you have already said, bringing out the most relevant points and conclusions you have made, and explicitly making points that may have been implicit. You may want to enumerate or list your conclusions. If so you could do so as follows:

- 1) This is an enumerated list.
- 2) All items are listed with numbers.
 - This is an itemized list.
 - All items start with a bullet.

- Note: It is possible to nest these lists.
 - 1) To many depths.

REFERENCES

- [1] Nicholas J. Higham. *Handbook of Writing for the Mathematical Sciences*. SIAM, 1993.
- [2] Leslie Lamport. *LaTeX User's Guide and Reference Manual*. Addison-Wesley, 1986.