My first LaTeXPaper

Number One *
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Abstract

Love, FEAR, *anger*, joy, excitement, and other emotions are abstract nouns. Courage, bravery, cowardice, and other such states are abstract nouns. *Desire*, creativity, uncertainty, and other innate feelings are abstract nouns. These are just a few examples of non-concrete words that are sensed. `Hey, this is not relevant`.

PACS numbers go here. These are classification codes for your research. See `http://publish.aps.org/PACS/` for more info.

1 Introduction

The introduction has five important responsibilities: get the audience 's attention, introduce the topic, explain its relevance to the audience, state a thesis or purpose, and outline the main points. By the end of the introduction, you should provide a road map that outlines your main points.

Introductions can be tricky. Because the introduction is the first portion of your essay that the reader encounters, the stakes are fairly high for your introduction to be successful. A good introduction presents a broad overview of your topic and your thesis, and should convince the reader that it is worth their time to actually read the rest of your essay.

Below are some tips that will make writing an introduction a little less daunting, and help us all to write essays that don't make our professors want to bang their heads against the wall.

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1.1 Subsection

Organize and develop your writing in sections and subsections–sometimes referred to as chunks. A section is a distinct part or chunk of a body of material. Sections and subsections may be one or more paragraphs long. The material in a section fits together under a topic, which is usually identified by a subject heading or subheading. By developing sections and subsections, you help the reader see how the material develops and make it easier for the reader to move around in the document. The sectioning or chunking strategy is one of the most effective means a writer has to make his or her material more readable.
The definition of Subsection:

1. a subdivision or a subordinate division of a section
2. a subordinate part or branch

In Wikipedia we can find the following definition: *subsection (plural subsections)*[1]

General A defined part of a section.

law A subpart of a legal document such as law.

taxonomy, zoology An informal taxonomic category below section and above family.

taxonomy, botany A taxonomic rank below the section, but above the species.

1.2 More in lists

Use numbered lists when you're explaining instructions that need to be performed in sequence. Numbered and unnumbered lists are most frequently used in academic and government publications.
The default numbering scheme is:

1. First level item
2. Arabic number (1, 2, 3, ...) for Level 1
   (a) Second level item
   (b) Lowercase letter (a, b, c, ...) for Level 2

[1] **Coordinate term:** subparagraph.

i. Third level item

ii. Lowercase Roman numeral (i, ii, iii, ...) for Level 3

A. Fourth level item

B. Uppercase letter (A, B, C, ...) for Level 4.

If numbers aren't essential use bullets, especially in business related documents. The default bullets scheme is:

- First Level is (•),
  - Second Level is (–) ,
    - Third Level is (∗),
      - Fourth Level is (·).

And some more advance settings:

- Default item label for entry one
- Default item label for entry two
- Custom item label for entry three

2 Verbatim typesetting.

A visually distinguishable textual part of the document (usually typeset with a monospaced, or typewriter font) that is allowed to contain the full ASCII character set. Verbatim text is often used to typeset parts of program source files, including TEX source.

```
>> r = randn(1000,1);
>> hist(r)
>> colormap([.7 .7 .7])    % to change the color and make it print better
>> print fig.eps
```

There are more by using relative packages.

Using the lstlisting environment from the **listings** package:

```
import numpy as np

def incmatrix(genl1,genl2):
    m = len(genl1)
    n = len(genl2)
```

```
for i in range(m-1):
    for j in range(i+1, m):
        [r,c] = np.where(M2 == M1[i,j])
            if M is None:
                M = np.copy(VT)
            else:
                M = np.concatenate((M, VT), 1)

            VT = np.zeros((n*m,1), int)
return M
```

The outupt ignores all LATEX commands and the text is printed keeping all the line breaks and white spaces typed. Code is usually stored in a source file, therefore a command that automatically pulls code from a file becomes very handy.

```
a = 5; b = 7;
c = a + b
d = c + sin(b)
e = 5 * d
f = exp(-d)
```

3 Lets write some Math.

Functional Differential Equations (FDEs) are differential equations in which the derivative of the unknown function has a value that is related to the solution as a function of another function . So, the general form of an FDE is

$$y^{(k)}(t) = f(t, y(t), y'(t), \ldots, y^{(k-1)}(t), y(u(t)))$$

where $f : \mathbb{R} \times \mathbb{R}^N \mapsto \mathbb{R}^N$, subject to initial or boundary conditions. When the function $u(t)$ is a proportional delay e.g. $u(t) = qt$, $0 < q < 1$, the differential equation is called to be of the pantograph type when it has the form of (1)

$$\begin{aligned} y^{(k)}(t) &= f(t, y(t), y'(t), \ldots, y^{(k-1)}(t), y(qt)),\ 0 < q < 1. \\ y^{(k)}(0) &= Y_0 \end{aligned} \tag{1}$$

Problem	Neural Network	Approximate Method	
Problem 1	1.96×10^{-10}	1.3×10^{-9}	(PIA)
Problem 2	1.6×10^{-8}	2.6×10^{-7}	(ChSP)
Problem 3	2.2×10^{-9}	10^{-8}	(ChSP)

Table 1: The measured errors

The QR factorization:

$$A = QR = \begin{bmatrix} | & | & & | \\ q_1 & q_2 & \cdots & q_n \\ | & | & & | \end{bmatrix} \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1n} \\ 0 & r_{22} & \cdots & r_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & & r_{nn} \end{bmatrix}$$

And a function:

$$\Im(x) = \begin{cases} \int_{\sqrt{2x+2}}^{\infty} \frac{t}{\sin(t^2)} dt & x \leq 0 \\ \sum_{i=1}^{-\infty} \cos(e^{x_i}) & \text{otherwise} \end{cases}$$

Man, writing math in LaTeXis great!

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4 Floating Objects

Where is the results Table 1?
Come on weak up.

Figure 1: You will need to include the package graphicx to be able to make figures like this.

Here is the results Table 2:

α	NN	ode23	ode23s	ode45	radau5	ode15s
0	$1.6e-5$	$1.7e-3$	$2.7e-4$	$1.1e-3$	$1.1e-5$	$1.5e-3$
1	$3.0e-5$	$2.7e-3$	$3.3e-4$	$2.0e-3$	$1.8e-5$	$1.4e-3$
2	$1.2e-5$	$5.1e-3$	$4.0e-4$	$2.9e-3$	$2.3e-5$	$2.1e-3$

Table 2: Problem 1 numerical results

.

5 Conclusions

What to say. I am astonished. Μία άχρηστη ετεροαναφορά [2]

6 Acknowledgments

The author wants to thanks Donald Knuth for inventing tex and Leslie Lambert [1] for enhancing it, and so publication of quality typesetting is a reality for scientists around the world.

Figure 2: You will need to include the package graphicx to be able to make figures like this.

References

[1] *LaTeX : A Documentation Preparation System User's Guide and Reference Manual*, Leslie Lamport [1994] (ISBN: 0-201-52983-1) pages: xvi+272.

[2] Περιοδικό Θησαυρός. **29**, 05 (1966).