



# Computer Science Department

## University of Crete

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## Natural Languages Processing on Parliamentary Commentaries, using Machine Learning.

Graduate thesis

Moschonas Giannis, Smyrnaiois Giorgos



GRADUATE THESIS 2015

# Natural Languages Processing on Parliamentary Commentaries, using Machine

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**Computer Science Department**  
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Heraklion, Greece 2015

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## Abstract

Natural Language Processing is a scientific field in the area of Computer Science, which seeks a better correlation between natural language and computers. In fact Natural Language Processing is a wide scientific field in which technologies such as "Machine Translation", "Named Entity Recognition and Disambiguation", "Sentiment Analysis" and more are included. This Thesis seeks a better approach in order to export information from plain texts, which basically contain civil placements on consultation laws issued by the Greek Government. Attempted to export proposals - counterproposal of the authors and also the arguments that the authors expressed. Finally attempted to export the entire view of the author summarized in a word "Positive" or "Negative", according to the opinion that the author expressed in the text. To export of these data is made entirely by analysing texts through a three step process (which will be explained in detail in the following chapter of this Thesis) and implementing techniques from the wide spectrum of NLP (such as Information Retrieval, Part-Of-Speech Tagging, Sentiment Analysis, etc.). The results show that we can create realistic methods in order to export this type of Semantic Information. Recently the research community gives more interesting on this subject, because it could be exploited in a number of other areas outside the field of Computer Science (eg. Journalism, Politics, etc.).

Keywords: argument extraction, sentiment, machine learning, suggestion extracton, POS Tagging.



## Acknowledgements

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# 1

## Introduction

This chapter presents the section levels that can be used in the template.

### 1.1 Section levels

The following table presents an overview of the section levels that are used in this document. The number of levels that are numbered and included in the table of contents is set in the settings file `Settings.tex`. The levels are shown in Section 1.2.

Name	Command
Chapter	<code>\chapter{<i>Chapter name</i>}</code>
Section	<code>\section{<i>Section name</i>}</code>
Subsection	<code>\subsection{<i>Subsection name</i>}</code>
Subsubsection	<code>\subsubsection{<i>Subsubsection name</i>}</code>
Paragraph	<code>\paragraph{<i>Paragraph name</i>}</code>
Subparagraph	<code>\paragraph{<i>Subparagraph name</i>}</code>

### 1.2 Section

#### 1.2.1 Subsection

##### 1.2.1.1 Subsubsection

##### 1.2.1.1.1 Paragraph

##### 1.2.1.1.1.1 Subparagraph



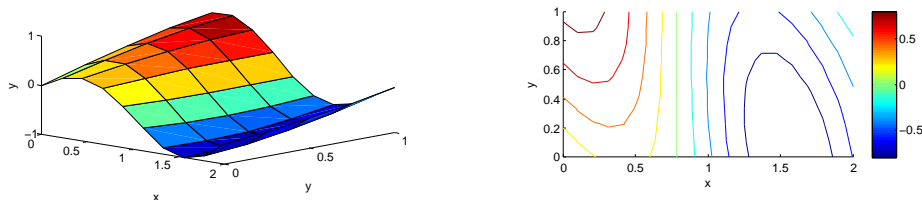


# 2

## Theory

In the following sections, examples of a figure, an equation, a table, a chemical structure, a list, a listing and a to-do note are shown.

### 2.1 Figure



**Figure 2.1:** Surface and contour plots showing  $z(x, y) = \sin(x + y) \cos(2x)$ .

### 2.2 Equation

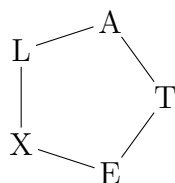
$$f(t) = \begin{cases} 1, & t < 1 \\ t^2 & t \geq 1 \end{cases} \quad (2.1)$$

### 2.3 Table

**Table 2.1:** Values of  $f(t)$  for  $t = 0, 1, \dots, 5$ .

$t$	0	1	2	3	4	5
$f(t)$	1	1	4	9	16	25

### 2.4 Chemical structure



### 2.5 List

1. The first item
  - (a) Nested item 1
  - (b) Nested item 2
2. The second item
3. The third item
4. ...

### 2.6 Source code listing

```
% Generate x- and y-nodes
x=linspace(0,1); y=linspace(0,1);

% Calculate z=f(x,y)
for i=1:length(x)
    for j=1:length(y)
        z(i,j)=x(i)+2*y(j);
    end
end
```

### 2.7 To-do note

The `todo` package enables to-do notes to be added in the page margin. This can be a very convenient way of making notes in the document during the process of writing. All notes can be hidden by using the option *disable* when loading the package in the settings.

Example of a to-do note.

# 3

## Methods

In this chapter we will thoroughly analyse the methods of this Thesis which are the base for the three step processing of the data. The three methods first introduced int the previous chapters.



# 4

## Results

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## 4. Results

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# 5

## Conclusion

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# Bibliography

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# A

## Appendix 1

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