



PES UNIVERSITY

(Established under Karnataka Act No. 16 of 2013)
100-ft Ring Road, Bengaluru – 560 085, Karnataka, India

6th Semester Project Report on

Context Analyzer

Submitted by

Harsha K Y (PES1201801839)

Jan – May, 2020

under the guidance of

Mr. Tamal Dey

Assistant Professor

Department of Computer Applications

PES University, Bengaluru - 560085

FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER APPLICATIONS

PROGRAM – MASTER OF COMPUTER APPLICATIONS



**FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER APPLICATIONS
PROGRAM – MASTER OF COMPUTER APPLICATIONS**

CERTIFICATE

This is to certify that the project entitled

Context Analyzer

is a bona fide work carried out by

Harsha K Y (PES1201801839)

in partial fulfilment for the completion of 6th semester project work in the Program of Study MCA with specialization in Data Science under rules and regulations of PES University, Bengaluru during the period Jan. 2020 – May 2020. The project report has been approved as it satisfies the 6th semester academic requirements in respect of project work.

Internal Guide

Mr. Tamal Dey,

Assistant Professor

Department of Computer Applications
PES University, Bengaluru – 560085.

Chairperson

Dr. Veena S

Department of Computer Applications
PES University, Bengaluru – 560085.

Dean-Faculty of Engineering Technology

Dr. Keshavan B K

PES University, Bengaluru – 560085.

Name and Signature of Examiners:

Examiner 1:

Examiner 2:

Examiner 3:

DECLARATION

I, **Harsha K Y**, hereby declare that the project entitled, **Context Analyzer**, is an original work done by us under the guidance of **Mr. Tamal Dey**, Assistant Professor, Department of Computer Applications, PES University and is being submitted in partial fulfilment of the requirements for completion of 6th Semester course work in the Program of Study **MCA**. All corrections/suggestions indicated for internal assessment have been incorporated in the report. The plagiarism check has been done for the report and is below the given threshold.

PLACE: Bengaluru

DATE:

HARSHA K Y

PES1201801839

ACKNOWLEDGEMENT

The satisfaction and euphoria are that successful completion of any task would be incomplete without mentioning the people who made it possible.

I would like to express my deep sense of gratitude to respected Vice Chancellor of PES University, **Dr. Suryaprasad K**, for giving the opportunity to work on this project.

I take this occasion to thank my sincere and heartfelt thanks to Dean, Faculty of Engineering and Technology, PES University, **Dr. Keshavan B K** and Chairperson, Department of Computer Applications, PES University, **Dr. Veena S** for their motivation, support and for providing a suitable working environment.

With a great pleasure, I express my sincere gratitude to my guide and project coordinator **Mr. Tamal Dey**, Assistant Professor, Department of Computer Applications, PES University for providing me with right guidance and advice at the crucial junctures which helped me in completing the project work on time. I am whole-heartedly thankful to him for giving me valuable time, suggestions and for showing me the right way in completing my project successfully and for providing schedule and timelines and documenting information about project.

I also thank other faculty members and friends at this occasion.

CONTENTS

| | |
|--|----------|
| 1. INTRODUCTION | 1 |
| 1.1. PROJECT DESCRIPTION | 2 |
| 2. LITERATURE SURVEY | |
| 2.1 BACKGROUND STUDY | 5 |
| 2.2 FEASIBILITY STUDY | 7 |
| 2.3 TOOLS AND TECHNOLOGIES | 8 |
| 3. HARDWARE AND SOFTWARE REQUIREMENTS | |
| 3.1 HARDWARE REQUIREMENTS | 10 |
| 3.2 SOFTWARE REQUIREMENTS | 10 |
| 4. SOFTWARE REQUIREMENTS SPECIFICATIONS | |
| 4.1 USERS | 11 |
| 4.2 FUNCTIONAL REQUIREMENTS | 11 |
| 4.3 NON – FUNCTIONAL REQUIREMENTS | 13 |
| 5. SYSTEM DESIGN | |
| 5.1 FLOW DIAGRAM | 14 |
| 5.2 DETAILED METHODOLOGY | 16 |
| 6. IMPLEMENTATION | |
| 6.1 SAMPLE SOURCE CODE AND DESCRIPTION | 22 |
| 6.2 SCREENSHOTS | 30 |
| 7. RESULTS AND DISCUSSION | |
| 7.1 CORRECT CLASSIFICATION | 37 |
| 7.2 WRONG CLASSIFICATION | 36 |
| 7.3 DISCUSSION | 38 |
| 8. SOFTWARE TESTING | |
| 8.1 TEST CASES | 41 |
| 9. CONCLUSIONS | 47 |
| 10. FUTURE ENHANCEMENT | 48 |
| APPENDIX A: BIBLIOGRAPHY | 49 |
| APPENDIX B: USER MANUAL | 50 |

LIST OF FIGURES

| | Page No. |
|--|-----------------|
| 1. Figure 5.1 – Flow diagram, ML View | 14 |
| 2. Figure 5.2 – Flow diagram, Web-application View | 15 |
| 3. Figure 5.3 – LSTM | 18 |
| 4. Figure 5.4 – Architecture of Sentiment Analysis Model | 19 |
| 5. Figure 5.5 – Architecture of Multi-class Classification Model | 20 |
| 6. Figure 5.6 – Architecture of Spam Detection Model | 21 |
| 7. Figure 6.1 – Server.js setup | 22 |
| 8. Figure 6.2 – Server.js routes | 23 |
| 9. Figure 6.3 – sentimentAPI.js | 24 |
| 10. Figure 6.4 – Home Page | 30 |
| 11. Figure 6.5 – Sentiment Analysis | 31 |
| 12. Figure 6.6 – Category Prediction | 32 |
| 13. Figure 6.7 – Spam Detection | 33 |
| 14. Figure 6.8 – API Documentation | 34 |
| 15. Figure 6.9 – Sentiment Response | 35 |
| 16. Figure 6.10 – Category Response | 35 |
| 17. Figure 6.11 – Spam Response | 36 |
| 18. Figure 7.1 – Training Epochs | 37 |
| 19. Figure 7.2 – Spam detection response | 38 |
| 20. Figure 7.3 – Category Wrong Prediction | 39 |

LIST OF TABLES

| | Page No. |
|-------------------------------|-----------------|
| 1. Table 8.1 – Test case T001 | 41 |
| 2. Table 8.2 – Test case T002 | 42 |
| 3. Table 8.3 – Test case T003 | 43 |
| 4. Table 8.4 – Test case T004 | 44 |

ABSTRACT

Text classification is an important task in supervised machine learning. A piece of text is assigned to one or more classes or categories. This can be done manually or with the help of powerful machine learning algorithms. The problem with doing this manually is that it takes up a lot of time and resources.

Let's say you own a blogging website or a news website. Every article that is being posted has to be classified and put into a category. Making people read these articles manually is both time consuming and expensive. It would be easier if the computer itself classified these articles, as soon as they are posted. This is where natural language processing comes into play. Natural Language Processing or NLP, is a Machine Learning (ML) task that is used to train an ML model to recognize text data and get meaningful insights from it. This means that a trained ML model will be able to go through some text data and give us some context on it.

So, if you pass an article as input, this model will be able to tell you where it belongs. NLP can also be used to do other interesting tasks such as Sentiment Analysis. This means that a model will be able to tell if some text data is positive, negative, or neutral about any topic that is in discussion. Context Analyzer provides solutions for both of these tasks.