Informatics Institute of Technology

In Collaboration With

University of Westminster, UK



*University of Westminster, Coat of Arms*

Abstractive Text Summarization Using Optimized Transformers

Literature Review

Mr. Nazhim Kalam

w1761265 / 2019281

Supervised by

Mr. Torin Wirasingha

September 2022

This Project Proposal is submitted in partial fulfilment of the requirements for

the BSc (Hons) Computer Science degree at

the University of Westminster.

Table of Contents

[List of Figures ii](#_Toc117635297)

[List of Tables ii](#_Toc117635298)

[1. CHAPTER OVERVIEW 1](#_Toc117635299)

[2. CONCEPT MAP 1](#_Toc117635300)

[3. PROBLEM DOMAIN 1](#_Toc117635301)

[4. EXISTING WORK 1](#_Toc117635302)

[5. TECHNOLOGICAL REVIEW 1](#_Toc117635303)

[6. EVALUATION APPROACHES 1](#_Toc117635304)

[7. CHAPTER SUMMARY 1](#_Toc117635305)

[REFERENCES I](#_Toc117635306)

# List of Figures

[Figure 12.1 - Prototype Feature Diagram (Self-composed) 13](#_Toc117550682)

[Figure 13.1 - Gantt Chart 16](#_Toc117550683)

[Figure 13.2 - Model development flow (Self-composed) 21](#_Toc117550684)

# List of Tables

[Table 5.1 - Related work in abstractive text summarization 3](#_Toc117584436)

[Table 11.1 - Research Objectives 9](#_Toc117584437)

[Table 13.1 - Research Methodology 13](#_Toc117584438)

[Table 13.2 - Deliverables and Dates 17](#_Toc117584439)

[Table 13.3 - Risk Mitigation Plan 19](#_Toc117584440)

**Acronyms**

|  |  |
| --- | --- |
| AI | Artificial Intelligence. |
| DL | Deep Learning |
| GUI | Graphical user Interface |
| ML | Machine Learning |
| NLP | Natural Language Processing |
| ROUGE | Recall-Oriented Understudy for Gisting Evaluation. |
| BLEU | Continuous-time Recurrent Neural Network. |
| T5 | Deep Learning. |
| BART | Graphics Processing Unit. |
| BERT | Long Short-Term Memory. |
| PEGASUS | Liquid Time-constant. |
| ILP | Machine Learning. |
| LSTM | Symmetric Mean Absolute Product Error. |
| RNN | Mean Absolute Scaled Error. |
| CNN  SEQ2SEQ | Mean Squared Error.  Sequence to Sequence |
| RoBERTa | Robustly Optimized BERT Pre-training Approach |
| GPT-3  REST | Third Generation Generative Pre-Trained Transformer  Representational State Transfer |

# CHAPTER OVERVIEW

In this chapter, the author presents critiques on prior relevant work about the use of abstractive text summarization in the domain of movie review summarization, along with the usage of advanced deep learning approaches such as transformers. Additionally, the author tries to create a generalized model that will handle several other domains in addition, not just to only the movie domain. Finally, the author determines the optimal transformer design that has been improved in order to produce the greatest outcomes by obtaining the optimum set of hyperparameters by model fine-tuning.

# CONCEPT MAP

The concept map illustrates the project scope that will be addressed in this literature review, and the nodes that are highlighted correspond to the project's primary study areas. The concept map was created to ensure that all necessary literature was covered. The concept map can be found in [**Appendix A – Concept Map**](#ConceptMap)**.**

# PROBLEM DOMAIN

## User Reviews

## Corporate Advantage

## Text Summarization

## 3.4 Abstractive, Extractive and Hybrid Approach

## 3.5 NLP with Deep Learning

## 3.6 Transformers

## 3.7 Hyperparameter Tuning

# EXISTING WORK

# TECHNOLOGICAL REVIEW

# EVALUATION APPROACHES

# CHAPTER SUMMARY

# REFERENCES

# APPENDIX A – CONCEPT MAP