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*University of Westminster, Coat of Arms*

Abstractive Text Summarization Using Optimized Transformers

Literature Review

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**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

The simplicity of selling products or services to customers is growing along with the usage of technology and the internet. Sellers utilize customer feedback to better decide how to improve sales and so attain customer satisfaction (Boorugu, Ramesh and Madhavi, 2019). When it comes to movies, people typically find it quite challenging to quickly determine whether a movie meets their demands by reading the reviews, which may occasionally be very lengthy and time-consuming (Khan et al., 2020).

## **User Reviews**

A user/customer review is typically referred to be written feedback from a customer who has used a product or service. Consumers frequently use user ratings and reviews to drive their purchasing decisions. Because the review data is unstructured, it becomes more challenging for consumers to compare and understand lengthier reviews (Lackermair, Kailer and Kanmaz, 2013).

User and customer reviews are extremely important to major corporations like tourism and hospitality as they constitute the primary engine for the country's economic growth and development. where tourists from over the world may blog about their experiences and share their reviews online in numerous formats (Mukherjee et al., 2020).

## **Corporate Advantage**

It is also known that it costs at least five times as much time and money to acquire a new customer as it does to keep an existing one, so it is important to learn how to foster customer loyalty to the brand, business, or service that is being offered. Customer satisfaction is essential to the survival of corporate industries. Understanding client expectations through their feedback or reviews helps business industries grow and fix faults (Pizam and Ellis, 1999).

On the other hand, companies like Netflix or Amazon Prime can use the movie summaries to help users and understand the watching pattern or their interest. Likewise, the movie-related industries need to allow the customers to quickly scan the summary and quickly decide whether they should be watching it or not (Khan et al., 2020).

## **Text Summarization**

With the massive accumulation of information/data on the internet nowadays, it is extremely difficult to extract relevant information from a large number of textual documents. The goal of text summarizing is to provide a condensed yet meaningful version of a lengthy textual content (Shi et al., 2020).

We all know that text summarization has several uses in a variety of internet-based fields, including search engines that are used for querying and e-commerce sites that utilize sentiment analysis to determine client satisfaction with items (Etemad, Abidi and Chhabra, 2021).

However, in the movie industry, consumers may utilize text summarization to simplify customer reviews of movies, which are often lengthy and time-consuming to read. This enables users to make better decisions when they decide whether or not to watch a certain movie (Khan et al., 2020).

## **3.4 Abstractive, Extractive and Hybrid Approach**

Generally, text summarization is classified into two which are; abstractive text summarization and extractive text summarization, however the approach for creating a hybrid model for text summarization is possible (Alsaqer and Sasi, 2017).

The abstractive text summarization technique aims to produce the sentences on its own and then uses them to provide a coherent summary. Therefore, the summary's content will vary from the original context yet still convey the same idea (Mahajan et al., 2021).

// Extractive summarization context

// Hybird summarization context

## **3.5 NLP with Deep Learning**

## **3.6 Transformers**

## **3.7 Hyperparameter Tuning**

# EXISTING WORK

# TECHNOLOGICAL REVIEW

# EVALUATION APPROACHES

# CHAPTER SUMMARY

# REFERENCES

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# APPENDIX A – CONCEPT MAP