



**Department of Electrical and Computer Engineering
North South University**

Senior Design Project

BanglaSense: Bangla Text Summarization Using Generative AI with Large Language Model

Md. Jahidul Islam ID: 1831533042

Faculty Advisor:

Dr. Shahnewaz Siddique

Associate Professor

ECE Department

Summer, 2023

LETTER OF TRANSMITTAL

January 2024

To

Dr. Rajesh Palit
Chairman,
Department of Electrical and Computer Engineering
North South University, Dhaka, Bangladesh

Subject: Submission of Capstone Project Report on “BanglaSense: Bangla Text Summarization Using Generative AI with Large Language Model”

Dear Sir,

With due respect, we would like to submit our **Capstone Project Report** on “**BanglaSense: Bangla Text Summarization Using Generative AI with Large Language Model**” as a part of our BSc program. The report deals with In-context learning and State-of-the-art Transformer model-based Bangla Text Summarization. Our proposed model is firstly learned from In-context learning techniques and we then fine-tuned on the xl-sum (Bangla) dataset and shows great performance on various evaluation matrices. We tried to the maximum competence to meet all the dimensions required from this report.

We will be highly obliged if you kindly receive this report and provide your valuable judgment. It would be our immense pleasure if you find this report useful and informative to have an apparent perspective.

Sincerely Yours,



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Md. Jahidul Islam
ECE Department
North South University, Bangladesh

APPROVAL

Md. Jahidul Islam (ID: 1831533042) from the Electrical and Computer Engineering Department of North South University, has worked on the Senior Design Project titled “BanglaSense: Bangla Text Summarization Using Generative AI with Large Language Model” under the supervision of Dr. Shahnewaz Siddique Partial fulfillment of the requirement for the degree of Bachelors of Science in Computer Science and Engineering and has been accepted as satisfactory.

Supervisor’s Signature

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Dr. Shahnewaz Siddique

Associate Professor

Department of Electrical and Computer Engineering

North South University

Dhaka, Bangladesh.

Chairman’s Signature

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Dr. Rajesh Palit

Professor

Department of Electrical and Computer Engineering

North South University

Dhaka, Bangladesh.

DECLARATION

This is to declare that this project is our original work. No part of this work has been submitted elsewhere partially or fully for the award of any other degree or diploma. All project-related information will remain confidential and shall not be disclosed without the formal consent of the project supervisor. Relevant previous works presented in this report have been properly acknowledged and cited. The plagiarism policy, as stated by the supervisor, has been maintained.



Md. Jahidul Islam

ACKNOWLEDGEMENTS

We would like to express our heartfelt gratitude towards our project and research supervisor, Dr. Shahnewaz Siddique, Associate Professor, Department of Electrical and Computer Engineering, North South University, Bangladesh, for his invaluable support, precise guidance, and advice about the research, and theoretical studies carried out during the course of the current project and also in its preparation.

Furthermore, we would like to thank the Department of Electrical and Computer Engineering at North South University, Bangladesh for facilitating the research. We would also like to thank our friend Kazi Rafat Haa Meem for helping us with this project. We would also like to thank our loved ones for their countless sacrifices and continual support.

BanglaSense: Bangla Text Summarization Using Generative AI with Large Language Model

ABSTRACT

Text summarization is used in various domains, such as generating concise summaries of news articles, documents including research papers, social media's long-form posts, and conversations to quickly and easily understand a long text. On abstractive text summarization, due to the scarcity of datasets and computing resources for mid-level languages, recent efforts have concentrated mostly on high-resource languages like English. In this research, we propose a Bangla Text Summarization system Using Generative AI with a Large Language Model. We use in-context learning techniques and instruction fine-tuning to train the mT5 pre-trained multilingual Transformer model on the XL-Sum (Bangla) dataset from the Hugging Face library. Our fine-tuned model performed the best in terms of relevancy and correctness with a remarkable 45.41 rouge1, and 33.85 rougeLsome Scores.