Department of Electrical and Computer Engineering
North South University

Senior Design Project

MediGenius AI:Fracture Recovery Revolutionized Using AI

Md. Khurshid Jahan	**1922079042**
Ashrin Mobashira Shifa	**1922216042**
Rokaeya Sharmin	**1911993042**

Faculty Advisor:

DR. MOHAMMAD ASHRAFUZZAMAN KHAN

Assistant Professor

ECE Department

Summer, 2023

LETTER OF TRANSMITTAL

Summer, 2023

To

Dr. Rajesh Palit

Chairman,

Department of Electrical and Computer Engineering

North South University, Dhaka

Subject: **Submission of Capstone Project Report on "MediGenius AI:Fracture Recovery Revolutionized Using AI**

Dear Sir,

With due respect, we would like to submit our Capstone Project Report on "MediGenius AI: Fracture Recovery Revolutionized Using AI" as a part of our BSc program. The report deals with the development of an image captioning system for fracture recovery utilizing both X-ray images and NLP data provided by medical professionals.This project was very much valuable to us as it helped us gain experience from the practical field and apply it in real-life scenarios. We tried our utmost to meet all the dimensions required for 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 y

Sincerely Yours,

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Md.Khurshid Jahan

1922079042

ECE Department

North South University, Bangladesh

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Ashrin Mobashira Shifa
1922216042
ECE Department
North South University, Bangladesh

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Rokaeya Sharmin
1911993042
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North South University, Bangladesh

APPROVAL

Md. Khurshid Jahan (1922079042), Ashrin Mobashira Shifa (1922216042) and Rokaeya Sharmin (1911993042) from Electrical and Computer Engineering Department of North South University, have worked on the Senior Design Project titled "MediGenius AI: Fracture Recovery Revolutionized Using AI" under the supervision of DR. MOHAMMAD ASHRAFUZZAMAN KHAN partial fulfillment of the requirement for the degree of Bachelors of Science in Engineering and has been accepted as satisfactory.

Supervisor's Signature

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DR. MOHAMMAD ASHRAFUZZAMAN KHAN

Assistant Professor

Department of Electrical and Computer Engineering

North South University

Dhaka, Bangladesh.

Chairman's Signature

…….

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.

Students' names & Signatures

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1. Md. Khurshid Jahan

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2. Ashrin Mobashira Shifa

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3. Rokaeya Sharmin

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to my project and research supervisor, DR. MOHAMMAD ASHRAFUZZAMAN KHAN, Assistant Professor in the Department of Electrical and Computer Engineering at North South University, Bangladesh. His unwavering support, precise guidance, and invaluable advice were instrumental in the successful execution of the experiments, research, and theoretical studies conducted throughout this project. Additionally, his assistance in the preparation of this report has been immensely appreciated.I would also like to extend my thanks to the Department of Electrical and Computer Engineering at North South University, Bangladesh, for providing the necessary resources and environment for the research to take place.Special gratitude is also owed to my friends Ashrin Mobashira Shifa, Rokaeya Sharmin and whose contributions played a crucial role in the completion of this project.

Last but not least, I am deeply thankful to my loved ones for their enduring sacrifices and unwavering support throughout this endeavor.

ABSTRACT

Submission of Capstone Project Report on "MediGenius AI:Fracture Recovery Revolutionized Using AI

This study introduces an innovative approach to fracture recovery utilizing artificial intelligence (AI) technology. A dataset comprising 1012 X-ray images, including 331 instances of fractures, sourced from St. Mariyaam Diagnostic Center, was meticulously annotated for nine distinct fracture types. Collaborative efforts with Dr. Rakibul Islam and Md. Asiful Rahman Maruf ensured accurate labeling and enriched the dataset with corresponding NLP descriptions and patient adviceAnticipating future enhancements, the integration of diffusion models is proposed, with the aim of synthesizing high-fidelity X-ray images. This development holds substantial promise in redefining fracture recovery procedures.