Department of Electrical and Computer Engineering North South University

Senior Design Project (499A and 499B)

On

DeepFake Video Detection

Course Instructor's name and initial:

Mohammad Ashrafuzzaman Khan (Azk)

Group Members:

Shayekh Mohiuddin Ahmed Navid-153124702

Shamima Haque Priya-1620069042

Umme Kulsum Ritu- 1511619042

Fatema Tuz Zohra- 1620191042

Department of Electrical & Computer Engineering

North South University

Submission date: 24/07/2020

Letter of Transmittal

July 2020,

To

DR. MOHAMMAD ASHRAFUZZAMAN KHAN

Associate Professor,

Department of Electrical and Computer Engineering,

North South University, Dhaka.

Subject: Submission of Senior Design Project "Deep Fake Video Detection" Report

Dear Sir,

We would like to submit our senior Design Project Report on "Title" as a part of our BSc program with due respect. The report deals with techniques and theories of Artificial intelligence and convolutional neural networks. The project is created to help individuals in our society to be able to detect any form of fake videos that can harm and jeopardize anybody's reputation and the image they hold in an organization. We believe that the device establishment will help students and people overcome cyber bullying and make things better for cyber victims in our society.

Cyberbullying in Bangladesh is not only an act to be scorned but an offense and can be punishable by the ICT Act of 2006. The Act provides that a person who knowingly publishes, through a website or electronically, any false and indecent content has the intention of corrupting people. People who are likely to read, see or hear the content or cause damage to a person's identity, or who may injure religious belief or instigate an offense against any person, shall be guilty of an attack against the individual publishing the material. A penalty with such a crime is prison and fine.

The Capstone project is very much valuable to every student of the engineering department. It helps a student understand the gap and mend the bridge between undergraduate and corporate life. It is considered to be a great learning experience for all engineering students. However, due to the situation created by COVID 19 pandemic, we tried the highest competence to meet all the dimensions required from this report.

We are very much honored to send your useful appraisal and to obtain this paper. We are pleased that this paper is helpful and insightful, and we will take a straightforward view of the matter.

Sincerely Yours,

Shayekh Mohiuddin Ahmed Navid

153124702

Computer Science and Engineering, Department of ECE

North South University, Bangladesh.

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Fatema Tuz Zohra

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Approval

The senior design project entitled “DeepFake Video Detection” by Shayekh Mohiuddin Ahmed Navid (153124702), Shamima Haque Priya (1620069042), Umme Kulsum Ritu (1511619042) and Fatema Tuz Zohra (1620191042) is approved in partial fulfillment of the requirement of the Degree of Bachelor of Science in Computer Science and Engineering on April, 2020 and has been accepted as a satisfactory project.

Supervisor:

Dr. Mohammad Ashrafuzzaman Khan

Assistant Professor

Department of Electrical and Computer Engineering

North South University

Dhaka, Bangladesh.

Department Chairman:

Dr. Mohammad Rezaul Bari

Associate Professor & Chairman

Department of Electrical and Computer Engineering

North South University

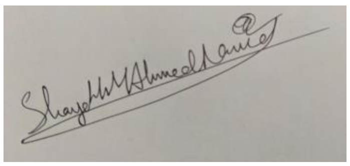
Dhaka, Bangladesh.

Declaration

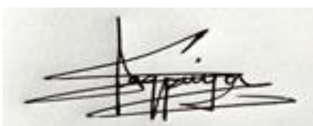
This is to certify that this project is our original work. No part of this work has been submitted elsewhere partially or fully to award any degree or diploma. Any material reproduced in this project has been appropriately acknowledged.

Students' Names and Signatures:

1. Shayekh Mohiuddin Ahmed Navid

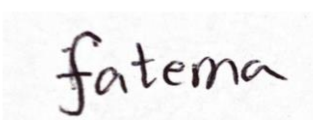


2. Shamima Haque Priya



3. Umme Kulsum Ritu

4. Fatema Tuz Zohra



Acknowledgement

By the Almighty's grace and mercy, we have completed our senior design capstone project entitled "Deep Fake Video Detection."

Foremost, we would like to express our sincerest gratitude to our advisor Dr. Mohammad Ashrafuzzaman Khan, for his continuous support in our capstone project progress throughout the whole CSE499A and CSE499B, for his patience, motivation, enthusiasm, and immense knowledge. His guidance helped us all in our research, writing, and completion of this project.

Our sincere thanks also go to North South University, Dhaka, Bangladesh, to provide an opportunity in our curriculum while enabling us to have industrial level experience as part of our academics.

We are also grateful to all the people who took part in our research and shared their valuable opinions regarding this project.

Finally, we would like to thank our families and friends as their inspiration, support, encouragement, and guidance kept us focused and motivated.

Abstract

The rapidly increasing number of photo editing tools like Photoshop and mobile apps such as Snapchat, Adobe Photoshop, PhotoScape, and many more makes it an effortless task to create fake content. We can also argue that the production of counterfeit videos has never been more unaffected. Therefore, our primary goal was to learn the techniques and steps for creating a false video in this case and detect whether an image is fabricated or real **(Sultani and Shah, 2019).** This paper presents a fundamental learning approach in which computer graphics are separated from authentic photographic images. Our proposed method uses a convolutional neural network with a customized pool to optimize the current algorithms' best-performing feature extraction system. The issue was split into two stages by traditional approaches: visual design or instruction, and prediction. Nevertheless, the research community is now focused on deep learning, inspired by promising results in computer vision.

For several forensic applications, such as fake detections and locations, local descriptors based on image noise remains have been incredibly sufficient. The compression which degrades the data significantly does not usually make conventional imaging forensic techniques appropriate for images.

A forger can change an image with many different image editing operations when making a forged image. A forensic investigator's interest in developing the forensic algorithms that can detect many operations and manipulations of varying image editing has arisen since each one of them is tested by forensic examiners **(Rossler et al., 2019).**

The rapid progress in the creation and exploitation of digital images has reached a point where significant concerns are raised about society's consequences. At best, this results in a loss of confidence in digital content, but may further cause damage by spreading false or fake information.