NORTH SOUTH UNIVERSITY

Department of Electrical and Computer Engineering

Senior Design Project

499A & 499B

Destruction Detection Using Proprietary Neural Network

Spring 2023

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APPROVAL

Abid Hasan Saheel ID# 1912084642, Fahim Hossain ID# 1813326642, Jannatul Ferdous Sristy ID# 1931533042, from Electrical and Computer Engineering Department of North South University, have worked on the Senior Design Project titled “Destruction Detection” under the supervision of **Dr. Atiqur Rahman (AQU).**
Partial fulfillment of the requirement for the degree of Bachelors of Science in Engineering and has been accepted as satisfactory.

Supervisor’s Signature

…….
Dr. Atiqur Rahman (AQU)
Lecturer

Department of Electrical and Computer Engineering

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Chairman’s Signature

…….
Dr. Rajesh Palit
Professor

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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

1. Abid Hasan Saheel

2. Fahim Hossain

3. Jannatul Ferdous Sristy

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Abstract

Recently, there has been a boom in Machine learning and deep learning, and rightfully so. Because they have revolutionised the way automation works in any field. And having specialised object detection can automize and make the previously known undoable tasks possible but also make it relatively easy.

And as the name suggests, detecting instances of semantic objects of a specific class (such as people, buildings, or cars) in digital photos and videos is the task of object detection. A branch of computer science linked to computer vision and image processing.

And using specialized Object recognition, which is a more intensive object detection system. We used it to spot damage on vehicles through image processing. And now our project can correctly classify if a car is damaged or Not Damaged. We used a sequential neural network to train our model. Which went through 120 epochs and achieved an accuracy of 0.98. It also obtained precision, recall, and F1 scores of 0.83, 0.71, and 0.79, respectively.

When a prediction value is obtained. It is based on a threshold of 0.5, the image is classified as "Car Damage" or "Car Not Damage." With this result, we can implement the model into any detection system, and it will detect a car and its damage value precisely, even with newer images.

Keywords: Object Detection, Machine learning, Deep Learning, Neural Network, Damage detection, Vehicle damage.