



CSE499
Project Report

Fake Image Detection Using Convolutional Neural Network (CNN)

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APPROVAL

This senior design capstone project entitled “Fake Image Detection Using Convolutional Neural Network (CNN)” by Iftekhar Amin Prince (NSU ID 1821523642), Md. Moin Hossain (NSU ID 1912959642), and Sardar Hadeeka Hea (NSU ID 1831384642) are approved in partial fulfillment of the requirement of the Degree of Bachelor of Science in Computer Science and Engineering in December and have been accepted as satisfactory.

APPROVED BY:

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Dr. Rajesh Palit
Department Chairman and Professor
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DECLARATION

This is to declare that this senior design capstone project entitled “Fake Image Detection Using Convolutional Neural Network (CNN)” is done by Iftekhar Amin Prince (NSU ID 1821523642), Md. Moin Hossain (NSU ID 1912959642), and Sardar Hadeeka Hea (NSU ID 1831384642) under the supervision of **Dr Atiqur Rahman**, Associate Professor of North South University. The report has been firmly written with full originality. 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.

DECLARED BY:

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ACKNOWLEDGMENTS

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Abstract

Fake image detection using CNN models involves the development of algorithms capable of distinguishing between genuine and manipulated images. This process entails collecting a diverse dataset encompassing both authentic and altered images. Preprocessing techniques such as resizing and normalization prepare the data for training. A major increase in the distribution of fraudulent photographs has been caused by the quick development of digital image manipulation tools and the widespread usage of social media platforms. The ability to distinguish between real content and modified content while determining the validity of photos has become a difficult challenge. Using convolutional neural networks (CNNs) for bogus picture identification, we present a novel strategy to address this problem in this research. The goal of our research is to create a precise and effective system that can recognize modified photographs automatically. We start by compiling a sizable dataset of real and fictitious photographs to represent various forms of modifications and transformations. We preprocess the data to standardize image sizes and improve feature extraction. Our method makes use of a deep learning architecture built on CNNs, which have proven to be incredibly effective in picture recognition tasks. Labeled examples are utilized to optimize the network's parameters during training utilizing a supervised learning methodology. To enable the network to learn hierarchical representations, we combine convolutional layers for local feature extraction and pooling layers for spatial downsampling. A CNN architecture, typically comprising convolutional and pooling layers followed by fully connected layers, is designed for image classification. Training involves optimizing the model's parameters through techniques like backpropagation and gradient descent. The validation and testing phases assess the model's performance on separate datasets to ensure its generalization capabilities. Effective deployment of the model enables real-time detection of fake images, although ongoing refinement is crucial due to the evolving nature of image manipulation techniques. We use methods like batch normalization and dropout regularization to increase our model's capacity for generalization. By avoiding overfitting, these techniques improve the model's capacity to discern between real and artificial image features.