



DAYANANDA SAGAR ACADEMY OF TECHNOLOGY & MANAGEMENT

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DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS

SYNOPSIS

On

**“A machine learning and inpainting
technology-based method for the removal of
specified objects.”**

Submitted in partial fulfilment of requirement for the award of the degree

MASTER OF COMPUTER APPLICATIONS

Of

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

By

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Project Synopsis

“A machine learning and inpainting technology-based method for the removal of specified objects.”

Overview: -

The primary motivation behind this project is to remove unwanted objects (up to 80) from photographs and fill in the gap in a visually plausible manner; we focus on removing objects as unwanted background objects are a frequent problem in photography. Common approaches require manual identification of the area to be removed, however we aim to be able to automatically detect the target area and create an end-to-end pipeline for background removal. Automation of this process can be extremely useful considering the prevalence of photo-taking nowadays, and could be incorporated into the image processing pipeline to produce better photographs without requiring user intervention.

Objectives: -

The overarching objective of this project is to develop a robust and automated end-to-end pipeline for removing up to 80 unwanted objects from photographs, addressing the prevalent issue of unwanted background elements in photography. The primary focus is on creating a seamless and visually plausible outcome without requiring manual identification of removal areas. The specific objectives include:

Automated Object Detection: Implementing Convolutional Neural Networks (CNN) and ResNet for the automatic detection of unwanted objects within the photographs.

Precise Object Removal: Employing advanced object removal techniques, including R-CNN (Region-based Convolutional Neural Network), Mask RCNN, and DeepFillv2, to accurately eliminate detected objects while preserving the visual integrity of the surrounding context.

Visually Plausible Inpainting: Utilizing DeepFillv2 for filling in the gaps left by removed objects with visually plausible content, ensuring that the edited photograph appears natural and seamless.

Scope: -

The scope of this project is to develop an automated end-to-end pipeline for removing unwanted objects from photographs and filling in the gaps in a visually plausible manner. The primary motivation behind this project is to address the common problem of unwanted background objects in photography. The goal is to eliminate the need for manual identification of the areas to be removed, making the process more efficient and user-friendly.

These techniques involve training models to understand the context of an image and then filling in the areas where the object was removed with plausible content that fits the surroundings.

By leveraging machine learning algorithms, these methods can handle complex scenes and produce more natural-looking results compared to traditional methods. They have applications in various fields, such as photo editing, video processing, and even restoring historical images.

However, it's essential to note that the success of inpainting and object removal largely depends on the quality and size of the training data, the sophistication of the algorithms used, and the specific use case. While they can yield impressive results, there may still be limitations in handling certain types of images or scenarios. Additionally, ethical considerations should be considered to avoid misuse of this technology in potentially harmful ways.

The existing system: -

In the existing system the object has to remove and fill the gap manually, which takes time and skills. Many image processing techniques are used in the traditional methods, which does not have high accuracy and results.

Proposed system: -

In the proposed system, the objects in a given image will be removed and the gap will be filled automatically using machine learning technology. Up to 80 objects can be removed in the proposed work. The output results are accurate compared to the traditional methods.

Hardware Requirements: -

- I3 processor
- 4GB RAM

Software Requirements: -

- Python IDLE
- Python.

Conclusion: -

In conclusion, our project introduces an automated solution for removing up to 80 unwanted objects from photographs and seamlessly filling the gaps using machine learning technology. The system leverages CNN, ResNet, R-CNN, Mask RCNN, and DeepFillv2 to detect and remove objects without manual intervention, offering a user-friendly and efficient photo editing experience.

The project addresses limitations in traditional methods, emphasizing the accuracy and efficiency of the proposed system. While acknowledging the importance of quality training data and ethical considerations, the automated approach stands out as a significant advancement over manual and less precise existing methods.

In essence, our proposed system signifies a transformative shift in image editing, promising a more streamlined and powerful tool for users across various applications, including photo editing, video processing, and historical image restoration.

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