NORTH SOUTH UNIVERSITY

A MULTICHANNEL LOCALIZATION METHOD FOR CAMOUFLAGED OBJECT DETECTION

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SENIOR DESIGN PROJECT

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Declaration

It is hereby acknowledged that:

- No illegitimate procedure has been practiced during the preparation of this document.
- This document does not contain any previously published material without proper citation.
- This document represents our own accomplishments while being Undergraduate Students at North South University.

Sincerely,

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Approval

I certify that I have read this dissertation and that, in my opinion, it is fully adequate in scope and quality as a dissertation.

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Abstract

Camouflaged objects can be difficult to detect because they blend in with their surroundings. There have been numerous studies on detecting camouflaged objects, and many of these have been recognized as effective approaches. This paper presents a new algorithm for detecting camouflaged objects by focusing on identifying the region of interest, which is crucial for detecting these objects. The algorithm uses Phase Fourier Transformation to create a filtered image, and Entropy to generate a feature map from the filtered image. The feature map is then used to determine the region of interest.

This paper proposes a multichannel method for discriminative region localization in Camouflaged Object Detection (COD) tasks. In one channel, processing the phase and amplitude of a 2-D Fourier spectrum generates modified form of the original image, used later for a pixel-wise optimal local entropy analysis. The other channel implements a class activation map (CAM) and Global Average Pooling (GAP) for object localization. We combine the channels linearly to form the final localized version of the COD images. Experimentation in multiple COD datasets demonstrates that the proposed method successfully localizes regions containing more than 80% of the camouflaged objects. Our proposed method does not require memory-intensive devices or prior training on particular image features, making it easily integrated into a resource-constrained environment. The proposed approach is also applicable to non-COD images