

# CS5175 Assignment - 2 Report

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## 1 Introduction

This report documents the implementation and results of Lab 2 for the EE5175 course. The assignment focuses on image occlusion using a combination of rotation and translation transformations. The script utilizes libraries like PIL library , NumPy for mathematical operations, Matplotlib for visualization , math .

## 2 Problem Statement

The task is to find the changes in IMG2 with respect to IMG1. It is also given that the images are related by an in-plane rotation and translation.

## 3 Methodology

The solution approach is first to know by how much the image was rotated and translated . We were given two point correspondences and from that, we could solve for the value of  $\theta$  ,  $t_x$  and  $t_y$  . Then an  $[R|T]$  transformation matrix was created from the previously fetched values.

A target matrix of the size of second image is created . Now we multiply the transformation matrix with the target matrix to get the  $x$  and  $y$  values of source matrix. These values are found so that we can do bilinear interpolation from image1 to find the values of target pixel. The thus obtained target matrix is the transformed image of IMG1 . This image has the same geometric transformations as IMG2. Now we can find the difference between the two by simply subtracting one from another.

## 4 Implementation

The provided Python script `assignment_2.py` includes functions for bilinear interpolation (`bilinear_interpolation`) and occlusion calculation (`occlusion`). The script executes the occlusion function with the computed transformation parameters and visualizes the original images along with the resulting occluded image.

## 5 Result

The output of the script is saved as output.png, showcasing the original IMG1.png, IMG2.png, and the occluded image. Additionally, the occluded image is saved as occlusion.png. The same are shown here:

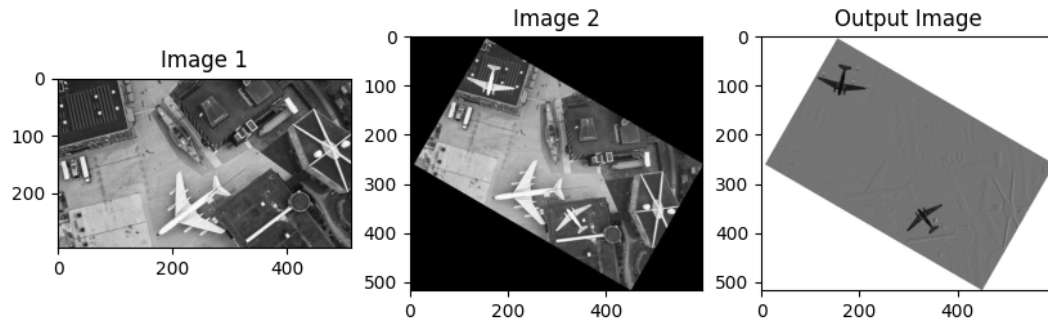


Figure 1: Output



Figure 2: Figure showing occlusion