

# Seam Driven Image Stitching

## Introduction

**Image stitching** or photo stitching is the process of combining multiple photographic images with overlapping fields of view to produce a segmented panorama or high-resolution image. This is done by aligning multiple images based on the best geometric fit of feature correspondences between overlapping images. Seam-cutting is used afterwards to to hide misalignment artifacts.

## Goal of Seam Driven Image Stitching

The traditional method of image stitching is quite naive and does not produce the best results of panoramic images. New method of image stitching where seam cutting is applied beforehand to compute the best homography provides much better result.

## Current Progress

- Our implementation is for stitching only two images.
- The **SIFT** algorithm is used to generate features in both images and **BFMatcher** is used to match the feature vectors in both images.
- The matched feature vectors are fed into a robust algorithm known as **RANSAC**. **Random sample consensus (RANSAC)** is

an iterative method to estimate parameters of a mathematical model from a set of observed data that contains outliers, when outliers are to be accorded no influence on the values of the estimates.

- This method is used to fit the model more robustly while at same time generating various homographies. Four random matched feature vectors are selected in each iteration. Homography is calculated for these four points.
- Now for all other feature vectors those having the geometric distance with the calculated homography greater than threshold are appended in the inliers. All other are outliers and the goal of algorithm is to reduce the number of outliers to best fit the model. Update of model homography is done when the number of inliers are greater than the maximum of inliers up until now.
- The generated model homography is warped on the image and stitched together.

## Milestones Left

- We have to change the test and hypothesize loop in the **RANSAC** algorithm. The update condition will change.
- Apply seam cut to all generated homographies and evaluate the seam cut as the update condition.

## Results





