Workshop #2: **Feature-Based Alignment**

**Learning Outcomes:**

Upon successful completion of this workshop, you will have demonstrated the abilities to:

* Understand the knowledge of features alignment.
* Write a demo program- implement the RANSAC algorithm for features alignment.

**Requirements:**

After extracted features from images, the next step is matching these features across different images(the set of matching features is geometrically consistent). Feature-based alignment is the problem of estimating the motion between two or more sets of matched 2D or 3D points. In the technique, a sparse set of features are detected in one image and matched with the features in the other image. A transformation is then calculated based on these matched features that warp one image onto the other. In this exercise, students are asked to write a simple image processing program that has the following basic function: alignment image based the features. Details of the functions are described below:

Function 1: RANdom SAmple Consensus- RANSAC is a parameter estimation approach designed to cope with a large proportion of outliers in the input data. RANSAC is a resampling technique that generates candidate solutions by using the minimum number of data points required to estimate the underlying model parameters. You are required to implement a RANSAC algorithm for image alignment based features.

Evaluation Criteria

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Criteria | Requires | Mark | Note |
| 1 | Write a program with graphics interface | Create an application with an interface to perform mouse actions. | 2 | Executed in the background when the program is running. |
| 2 | Function 2: RANSAC algorithm | Implement RANSAC algorithm for image alignment | 8 | Using mouse or keyboard |
| 3 | Total |  | 10 |  |