

Description for general public

In the case of many computer vision problems, two images of the same place made in different perspective or time need to be linked. This may in result lead to creating panoramic photo (see Fig. 1).

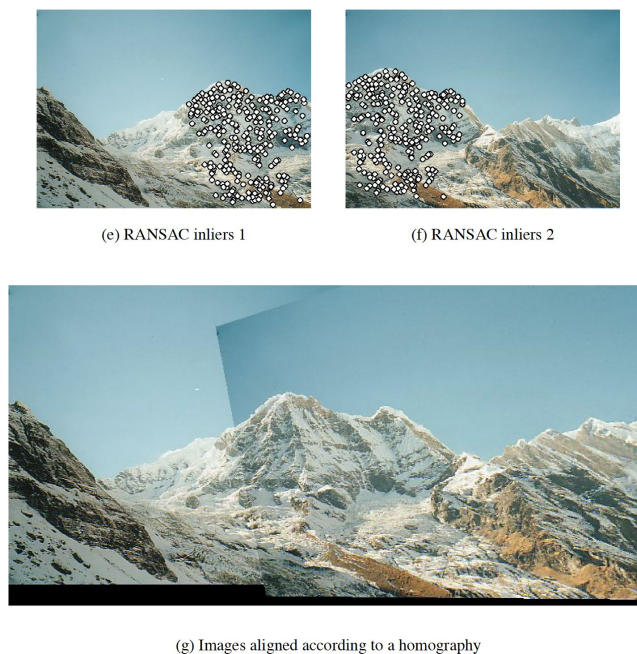


Figure 1: An example of applying detectors and descriptors of the key points in creating panoramic photos [Brown et al., 2007].

In order to link two images, it is necessary to link their characteristic points, called keypoints. Such points are first detected using algorithms called detectors, and then they are described using algorithms called descriptors.

The research project objective is to extend the most popular detectors and descriptors by the topological information.

Topology is a field of mathematics which studies features of geometrical figures (topological spaces) which do not change under continuous deformations. Topological features are preserved when figures are stretched, compressed or bent, but are lost under gluing or tearing.

Initial experiments showed that topological features are worse than non-topological features, however their combination is the most accurate. Therefore, we put a hypothesis that the similar results will be obtained when applying topological information into existing descriptors, and in result many computer vision problems (such as creating panoramic photo) will be improved.