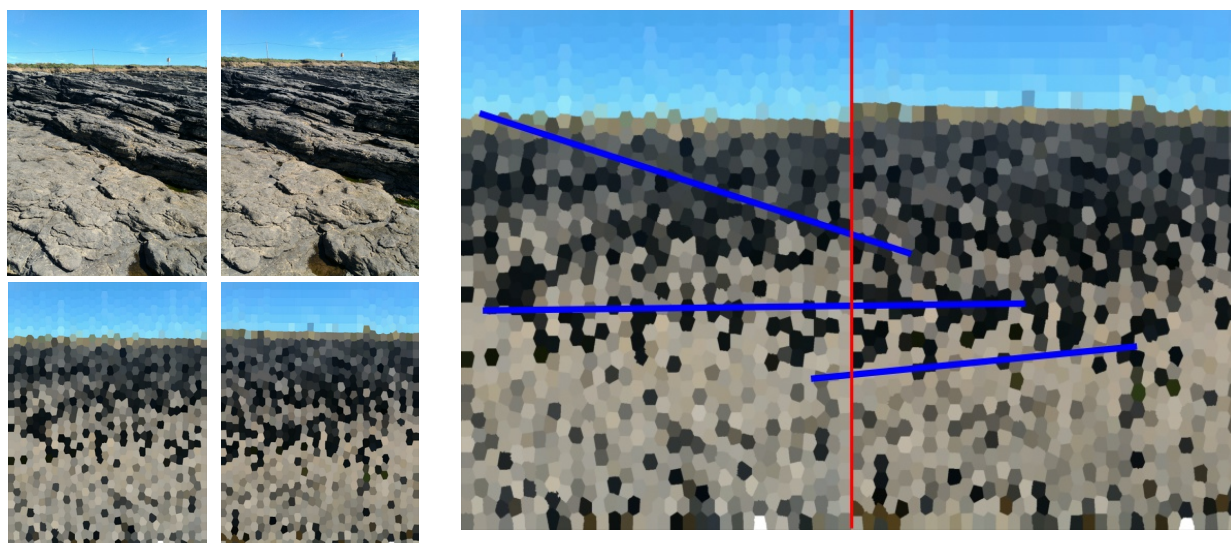# Using Regional Image Descriptors for Image Panorama Reconstruction



A common task in image processing and its further application in Computer Vision- and Graphics is the connection and registration of related images in an image series. This relation establishment is done by matching features descriptors between two images, and then recalculating the transformation of one image into the other. The applied image series can be photo panoramas, 360 degree images, or structure-from motion images.

Traditionally, the kind of features used for this matchings are points, and the descriptors define local image properties around the point. Point descriptors are easy to compute, but their calculation gets exceedingly time consuming and noise-sensitive for very large images. Furthermore, they have disadvantages under changing lighting conditions. Feature regions promise to be more stable to noise and lighting changes, and are more compact in their representation.

You objective would be to implement a software prototypes that takes pairs of images as input, split the images into regions, from a region descriptor, and use that descriptor to match regions between the images. Ideally, you also compute the homography to extract the mapping transformation. You will be provided with guidance on the theory, the algorithms and data structures available, and an early test-case prototype you can extent.

Short programming project – key information:

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| Contact | Christian Kehl (c.kehl@rug.nl) |
| Goal | Develop a prototype for region-based homography, to be tested on panorama reconstruction |
| Prior knowledge | Beginner level knowledge of Python, Numpy, ScyPi and either (a) Scikit-Image or (b) OpenCV |
| Collaborators | None |