MATHÉMATIQUES ET INFORMATIQUE
Sciences
Université Paris Cité

Master 1 Informatique - IFLBX030 Introduction à l'analyse d'images

Practical session - Edge & keypoint detection

Exercise – Image gradient

1. Compute the gradient magnitude of the image « football.jpg ». Rescale it to take values between 0 and 255 (inclusive).
2. Threshold the result at e.g. graylevel value 100.
3. Use this to obtain an image containing *only* the seam of the ball.
4. Compute the gradient orientation and show the result as a heatmap.

Exercise - Hough Transform

Fimiliarize yourself with openCV functions:

- cv2.HoughLines()
- cv2.HoughLinesP()
- cv2.HoughCircles()

A demonstration of line detection can be found here[1] and for circle detection, see here[2].

1. Use this to detect lines in ‘corridor.png’ and circles in ‘coins.png’, both which can be found in the image folder.

Exercise - Keypoint detection - Harris detector

Fimiliarize yourself with openCV functions:

- cv.cornerHarris()
- cv.cornerSubPix()

A demonstration of keypoint detection can be found here[3].

1. Use this to detect corners in the image ‘bretelle.jpg’ which can be found in the image folder.
2. Apply a rotation to the initial image and observe the results.

Exercise - Keypoint detection - FAST algorithm

1. Reproduce the previous results with the FAST keypoint detector.

[1] https://docs.opencv.org/3.0-beta/doc/py_tutorials/py_imgproc/py_houghlines/py_houghlines.html
[2] https://docs.opencv.org/3.0-beta/doc/py_tutorials/py_imgproc/py_houghcircles/py_houghcircles.html
[3] https://docs.opencv.org/4.x/dc/d0d/tutorial_py_features_harris.html