Feature Detection and Tracking
Computer Vision Assignment

Samuele Bortolotti

University of Trento

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Proposed method

Feature detectors:

- Harris corner detector
- Simple Blob detector
- SIFT
- ORB

All complemented with:

- Lucas-Kanade optical flow
- Kalman filter

Tracking

## Lucas-Kanade

Kalman filter

Lucas-Kanade

- Flawless way of tracking features in a slowly moving environment;
- Test video compliant with the Optical Flow assumptions;
- Achieves better performances with respect to the Kalman filter in the test video

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Kalman filter

Proposed pipeline

- Lack of observations;
- Observations provided though a brute force matcher;
- Descriptors are needed

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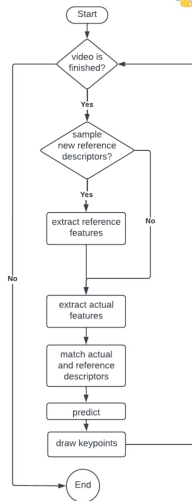
Harris Corner detector

- Simple
- Positive result
- Few keypoints detected

Harris descriptors limekiln.jpg
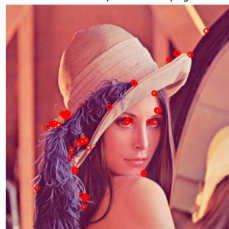
Simple Blob detector

- Context dependent
- Not scale invariant
- Do not work with Kalman since few keypoints are detected

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ORB detector

- Fast
- Well distributed keypoints
- The best I have tried in terms of quality/time performances

ORB descriptors Lenna.png

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SIFT detector

- The most accurate among those tried
- Astonishing results if devices posses high computational capabilities
- Impractical with the Kalman filter pipeline I have proposed

ORB descriptors Lenna.png

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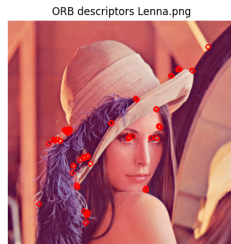
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