

SSIP 07

Some rumors about those colour interest points... Julian Stöttinger

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Content

- Problem definition
- Idea of Interest Points
- State of the Art
- The Scale Selection
- Conclusion

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• Scale Invariance
• Shifting corners
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Object Recognition == Image Retrieval ?

MUSCLE showcase

Input Image → Locations → Local Description → Matching Features → Result: Cheetah

Feature Database

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Interest Points

input/10/0_rml.png/output/10/0_cmu-Harris_regions/Paints: 600ds 2cLoG 5sigma: 1ncalstep: 1level: 2cvs: 1

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Colour Harris - State of the Art

- Moravec
- Harris
- Montesinos - RGB
- Weijer - colour spaces
- Quasi Invariant colour space
- Colour statistics

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Scale Determination

- State of the Art: Extrema of Laplacian of Gaussian
- PCA on colour information gives colour saliency
 - trade-off between favouring rare colours and retaining information on similar colours
 - independent of predefined thresholds
 - less and more meaningful locations?





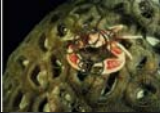


Illumination ScV Harris colour boosted ScV Harris Quasi Invariant ScV Harris

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Shifting corners towards colour

Illumination RGB rgb








OCS colour boosted OCS Quasi Invariant HSI

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Shifting corners towards colour

Illumination RGB rgb

OCS colour boosted OCS Quasi Invariant HSI

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Conclusion

- Using different colour spaces moves corners to more distinct locations
- Scale determination crucial for ROI detection and retrieval rate
- PCA on colour data enhances scale stability and makes results more distinct
- Interest points can be related to colour space properties: what can we do with that?

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Thank you! Questions?

Some source code / binaries used in showcase

Affine covariant features, regions, descriptors (SIFT) and evaluation:
<http://www.robots.ox.ac.uk/~vgg/research/affine/>
 Open implementation of SIFT
<http://vision.ucla.edu/~vedaldi/code/sift/sift.html>

Some classifiers:
 libSVM <http://www.csie.ntu.edu.tw/~cjlin/libsvm/>
 Nearest Neighbour <http://www.cs.umd.edu/~mount/ANN/>

Literature

C. Harris and M. Stephens, "A combined corner and edge detection," in *4th Alvey Vision Conference*, 1988, pp. 147–151.

T. Lindeberg, "Feature detection with automatic scale selection," *IJCV*, 30(2):79–116, 1998.

P. Montesinos, et al., "Differential invariants for color images," in *ICPR*, 1998, p. 838.

J. van de Weijer and T. Gevers, "Edge and corner detection by photometric quasi-invariants," *PAMI*, 27(4):625–630, 2005.

J. Stottinger, A. Hanbury, N. Sebe, T. Gevers, "Do colour interest points improve image retrieval?", to appear, *ICIP*, Sept 2007.

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