Abstract

- The Highly Successful Bag-of-Words technique forms the basis of all top image classification systems.
- In this demo we use a Bag-of-Words implementation that stood at the basis of our highly competitive Pascal VOC 2008-2011 entries.
- To make its workings more insightful, our IJCV paper measures for each pixel how much it contributes to the classification of an object.
- We divide the contribution into Object and Surround.
- We visualise the per-pixel classification contribution.
- Our interactive demo enables exploration of the Pascal VOC 2010 validation dataset based on the Object/Surround contributions.

Bag-of-Words details

- Pixel-wise Sampling. Using dense acceleration (Uijlings 2010)
- 5 Colour SIFT (Lowe 2004, Sande 2010)
- Random Forest as vocabulary (Moosman 2006, Uijlings 2010)
- Normalize Codebook Vectors using square root (Perronnin 2010, Uijlings 2010)
- Support Vector Machine (libsvm)
- Histogram Intersection Kernel
- Fast Additive Classification (Maji 2009)
- Good Pascal 2007 performance: 0.585 MAP (e.g. Chatfield 2011, Perronnin 2010 report 0.593-0.617 MAP)

Visualisation Framework

Visualising Bag-of-Words

References