Minimizing hallucination in Histogram of Oriented Gradients

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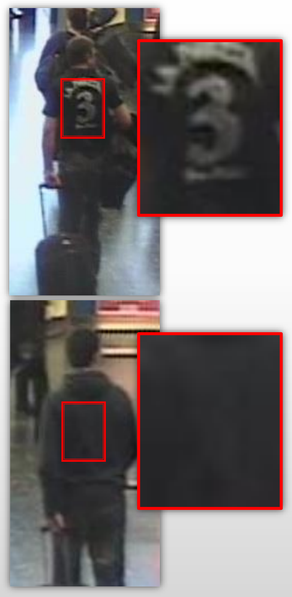
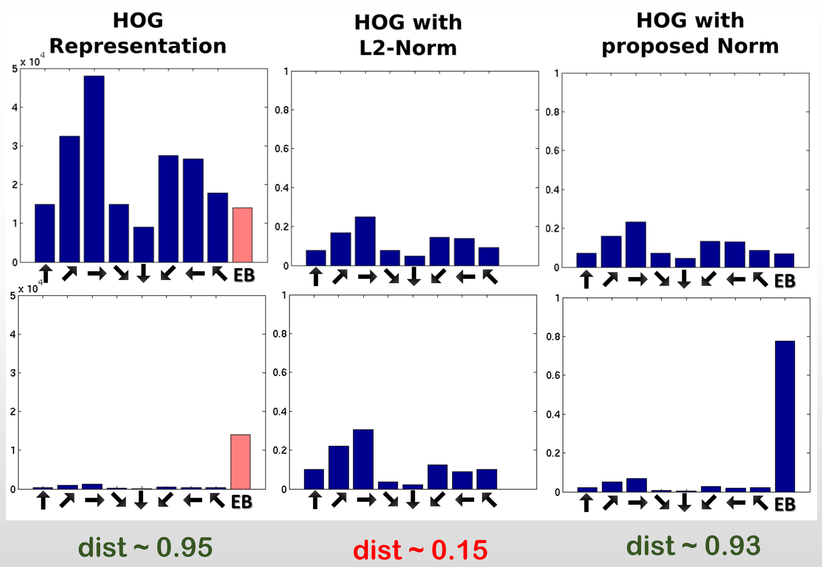
Motivation

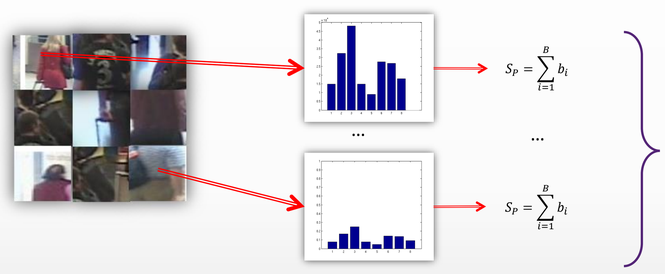
- Textured patch:
- Non-textured patch:

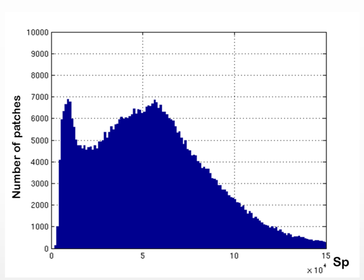




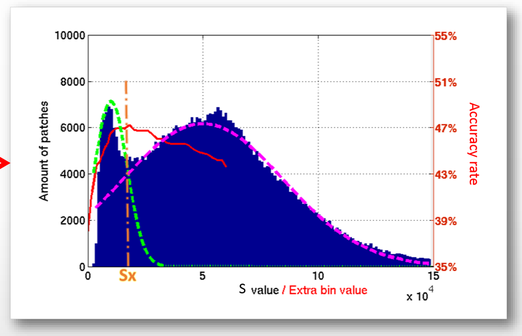
While normalization step is crucial for obtaining good performance on HOG (DALAL CVPR05), it produces an hallucination effect on non-textured patches.

Extra bin calculation





$\mathcal{S} = \mathcal{N}_1(\mu_1, \sigma_1) + \mathcal{N}_2(\mu_2, \sigma_2)$



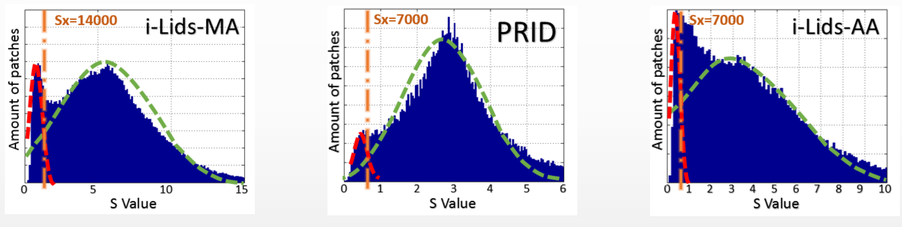
1. Compute HOG signature from randomly sampled patches from the Dataset

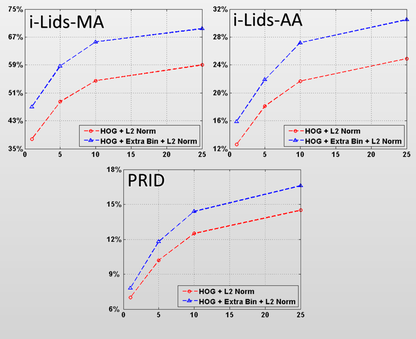
2. Generate a distribution of $\mathcal{S}$ where $s_P = \sum b_i$

3. Fit two Gaussian models using Expectation Maximization and find the intersection

Experimental results

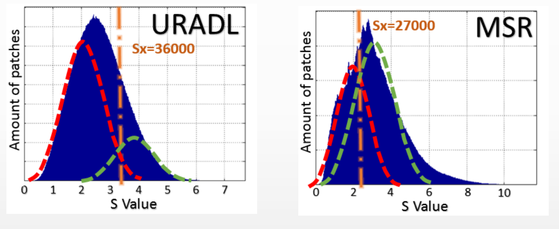
Person re-identification





DATASET	HOG L2 Norm	HOG Our Norm
i-LIDS-MA	37,8%	**47,0%**
i-LIDS-AA	12,6%	**15,9%**
PRID 2011	07,0%	**07,8%**

Action recognition



DATASET	HOG L2 Norm	HOG Our Norm
MSR Activity 3D	46.88%	**49.06%**
URADL	71.33%	**78.00%**

AVSS 2015: 12th IEEE International Conference on Advanced Video and Signal-based Surveillance, Karlsruhe, August 25-28, 2015