Learning object detection from a small number of examples: the importance of Good features

Proposed paper- Modified Viola Jones

Authors - Kobi Levi and Yair Weiss
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Overview

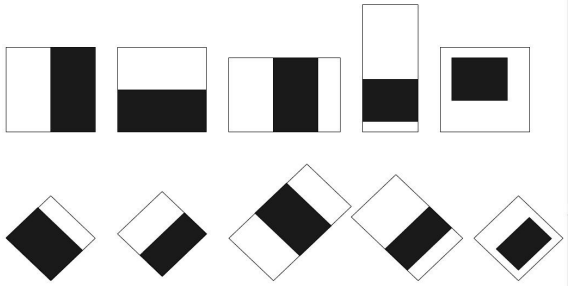
- Cascade window
- adding some more filters
- Classifying face or not

System Architecture

- **Cascade classifier** (Viola Jones)
- $$H_t(x) = \sum_{i=1}^{n} \alpha_i h_i(x)$$
- $$h_j(x) = \begin{cases} 1 & if F_i(x) < T_i \\ -1 & otherwise \end{cases}$$

Filters for adaboost

- Linear edge detector
- Average intensity detectors
- Local edge orientation histogram(EOH)



Sobel masks

- Two types of gradients
- X and Y directions
- $$G_x = \begin{bmatrix} -1 & 0 & +1 \\ -2 & 0 & +2 \\ -1 & 0 & +1 \end{bmatrix} \qquad G_y = \begin{bmatrix} -1 & -2 & -1 \\ 0 & 0 & 0 \\ +1 & +2 & +1 \end{bmatrix}$$
- $$G = \sqrt{G_x^2 + G_y^2}$$

Edge Orientation Histogram

- Integral image
- $$E_k(R) = \sum_{(x,y)\epsilon R} \psi_k(x,y)$$
- Dominant Orientation Features
- Symmetry Features

Experiment

- Applying this cascade classifier with manga dataset

- Object Detection algorithm (multiple kernel for object detection)
- EOG (Local Edge orientation Histogram)
- SVM

Thank you