Pedestrian Detection

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Pedestrian Detection

- Pedestrian Detection will help to recognize people on the street and tell the drivers if there is any.

Justification

- Pedestrian detection plays an important role in video surveillance systems.
- Crossing a street is dangerous for pedestrians. Drivers ignore what's on the street if they have the green light. This project will help recognize if there is a person on the street or not.
- Automatic pilot with pedestrians detection.

State of the art

- Object detection is a task that has been exhaustively analyzed for a great number of researchers. However, detecting humans is an area that still needs a lot of work.
- The usage of HOG descriptors and SVM classifiers are the main approaches to detect people.

Challenges

- Occlusion
- Clothes
- Accessories
- Posture

Pedestrian Detection description

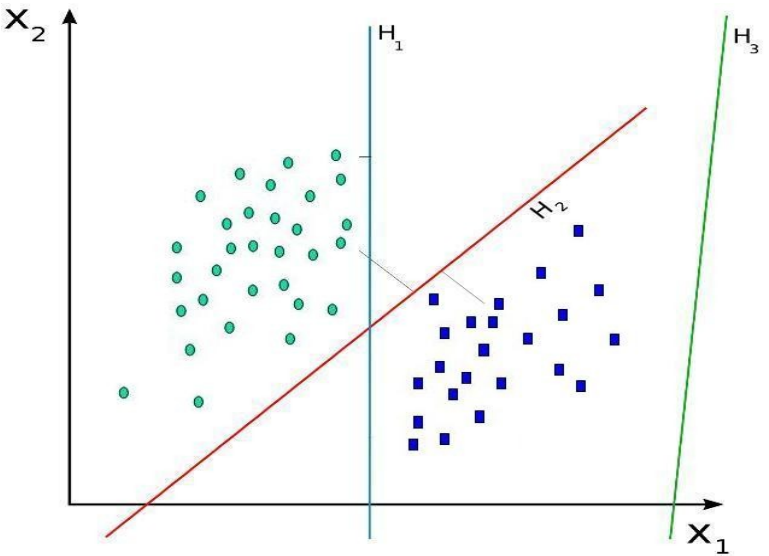
- This pedestrian detector will be based in HOG descriptors and SVM classifiers.
- OpenCV includes a class for HOG descriptors.

HOG

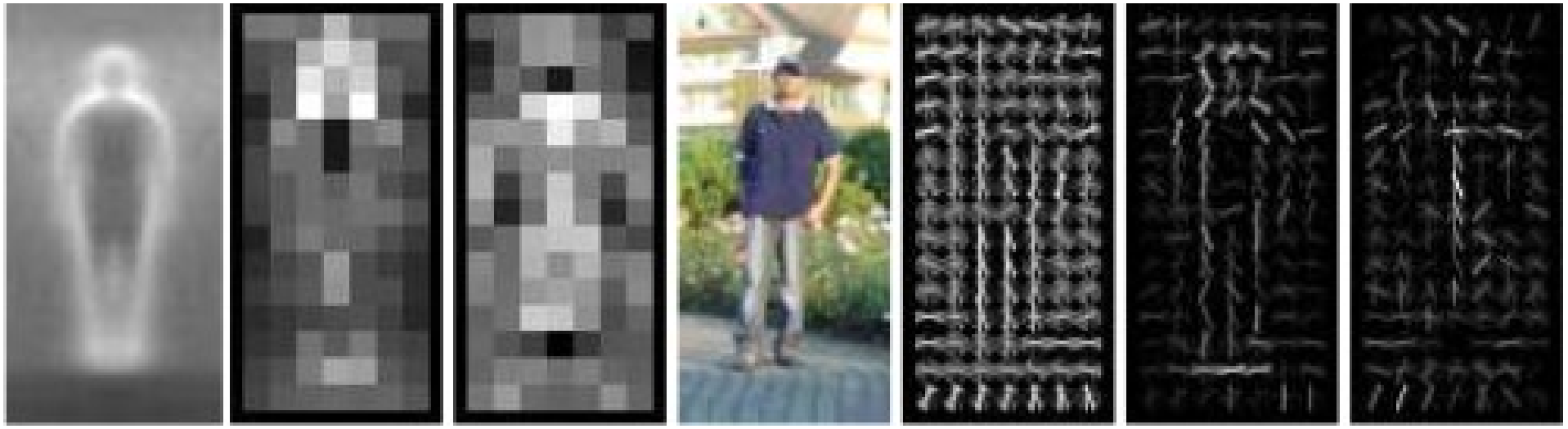
- Histogram of Oriented Gradient descriptor is used to detect objects in images.
- Image is divided in cells.
- The HOG is computed. The cells are discretized taking into account the gradient orientation.
- Blocks are formed with adjacent cells.
- Each histogram is normalized.

SVM

- Support Vector Machine
- Classification. Supervised learning



HOG Descriptor and SVM



References

- Dalal, N., & Triggs, B. (2005, June). Histograms of oriented gradients for human detection. In Computer Vision and Pattern Recognition, 2005. CVPR 2005. IEEE Computer Society Conference on (Vol. 1, pp. 886-893). IEEE.
- Dalal, N., Triggs, B., & Schmid, C. (2006). Human detection using oriented histograms of flow and appearance. In Computer Vision–ECCV 2006 (pp. 428-441). Springer Berlin Heidelberg.