

- SIFT(Scale-invariant Feature transform) : Makes features scale invariant, rotation invariant etc.
https://opencv-python-tutroals.readthedocs.io/en/latest/py_tutorials/py_feature2d/py_sift_intro/py_sift_intro.html
- HOG(Histogram of gradients) :
<https://www.learnopencv.com/histogram-of-oriented-gradients/>
- 2000 regions proposed by selective search are warped and sent into CNN to get feature vector that is used to predict class of region by SVMs and uses non-max suppression for each class.
- As data is limited, so they pre-train the network on normal images and fine-tune it for warped images.
- RCNN can also be used for semantic segmentation and achieved SOTA accuracy.
- Objectness [1], selective search [32], category-independent object proposals [11], constrained parametric min-cuts (CPMC) [5], multi-scale combinatorial grouping [3], and Cires,an et al. [6] are methods to get region proposals.
- CNN architecture changed only at end by replacing 1000 unit FC with 21(20C + background) FC.
- For visualising features they sorted each feature in the final convolutional layer based on how much they are activated by each image which tells which objects that feature detects.
- To check which layers of the CNN were not important, the last FC layers were compared to the CNN without fine-tuning to check which layers generalise well.
- Major error was due to poor localisation (IoU between 0.1 and 0.5). Confusion with similar class and Misclassifying region as background was secondary error.
- Loose localization likely results from use of bottom-up region proposals and the positional invariance learned from pre-training the CNN for whole-image classification.
- Mislocalization error decreased when box regression was used for region proposals.
- For semantic segmentation, there are 2 strategies for computing features:
 - Full : directly input warped image into CNN.
 - Fg : mean subtracting the image so that background pixels are almost zero, which is like masking.
 - Fg features perform better than full features on validation set.