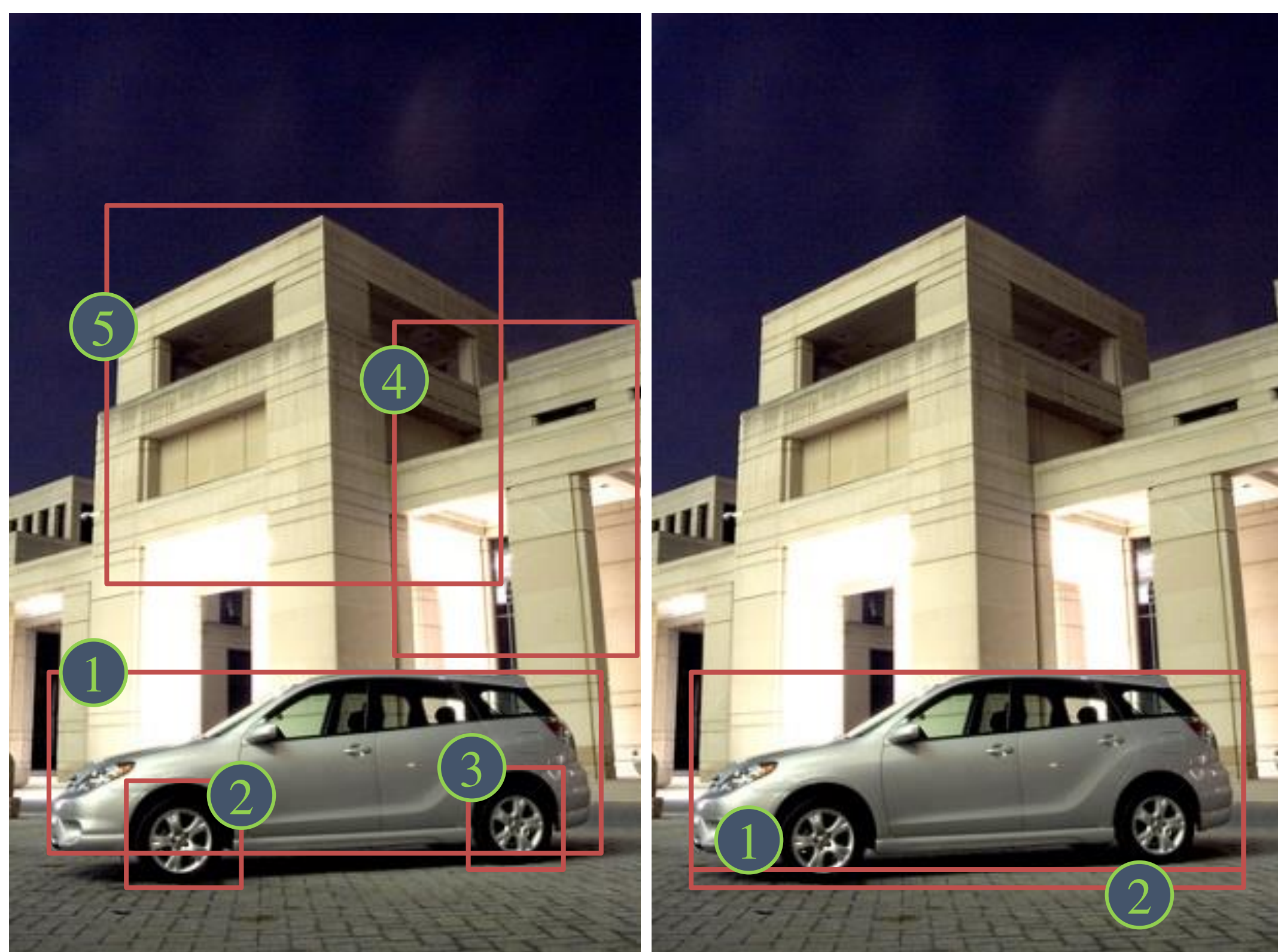


One Shot Detection : For a new unseen class, when knowing only one image of this class, we can detect the location of the object in another picture. This is the purpose of one-shot detection.



Algorithm : merge proposals

Input: proposals generated by selective search $\{P_n\}_1^N$,

the best result of the first round R

Output: merged proposals $\{Q_m\}_1^M$

1 Initialization: $n=1, m=1$

2 **while** $n \leq N$ do

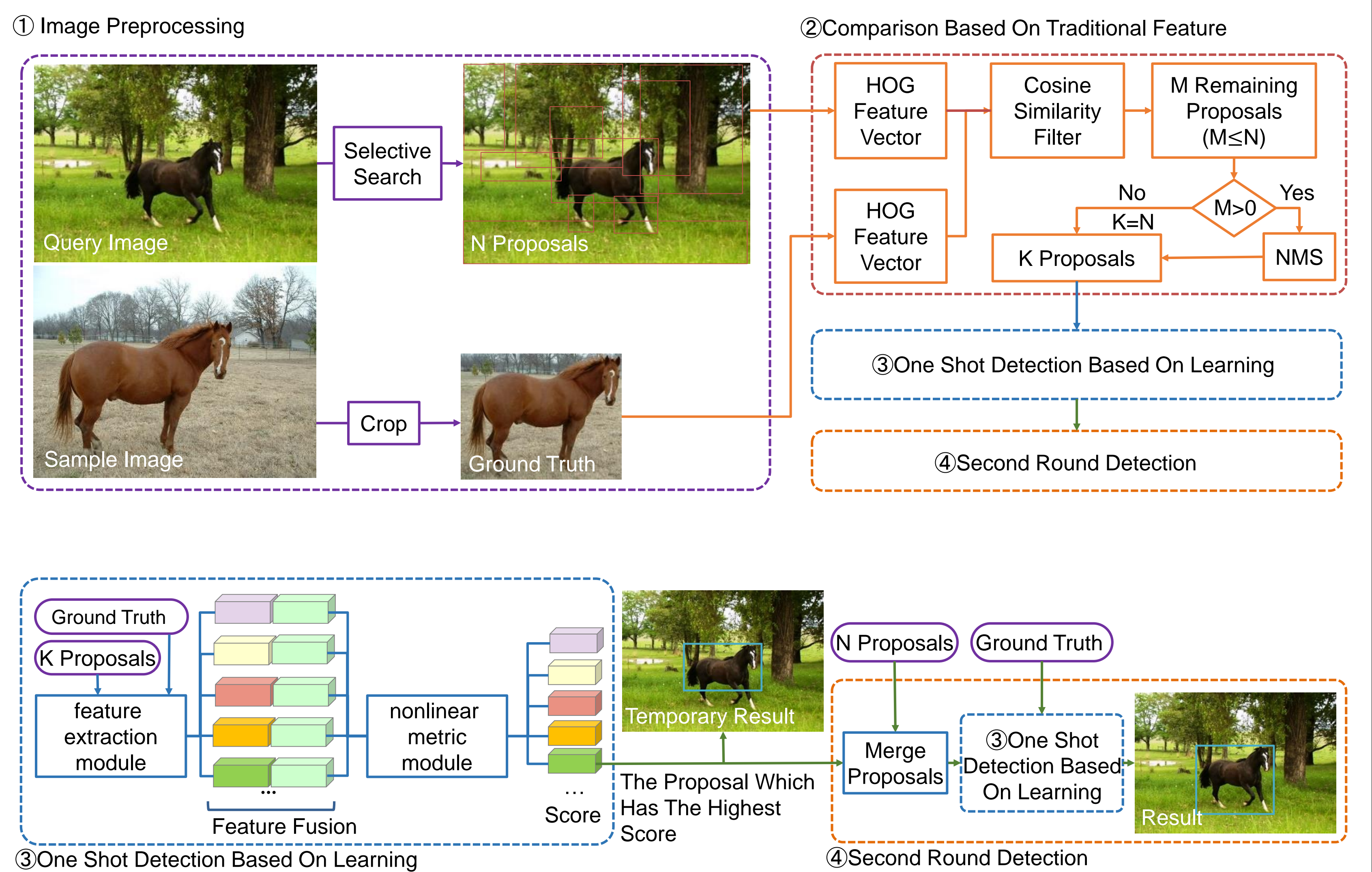
3 **if** P_n is overlapped with R

4 **then** $Q_m = \text{merge}\{P_n, R\}, m=m+1$

5 $n=n+1$

6 **return** $\{Q_m\}_1^M$

Detection Process

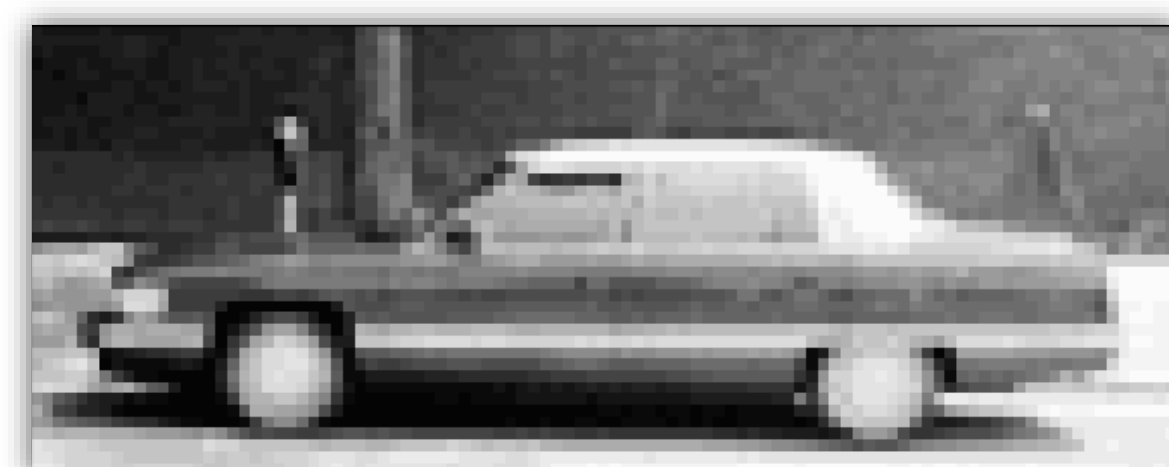
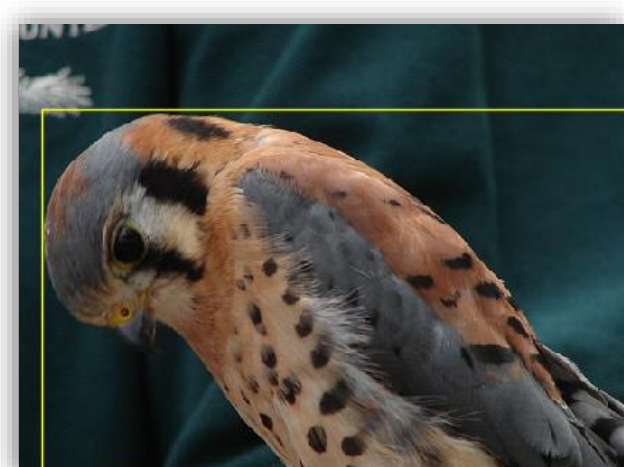


$$(1) \{x_n\}_1^N = S(X)$$

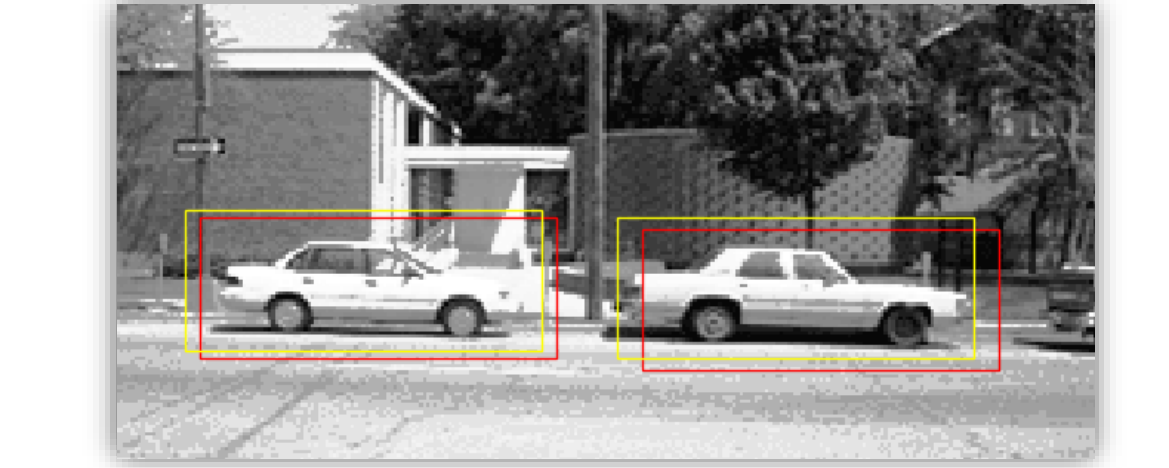
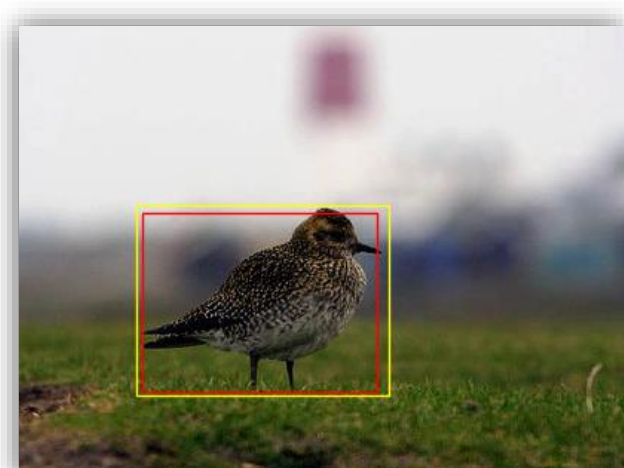
$$(2) R = K_{top} \{f(c(g(x_n), g(Y)))\}$$

In Eq. (1), X is the query image and S means the selective search. In Eq. (2), x_n is the proposal generated by $S(X)$ and Y is the sample image. c fuses the feature by concatenating the channels of $g(x_n)$ and $g(Y)$. g means the feature extraction module and f is the nonlinear metric module. K_{top} denotes that it gets the top-k values.

Sample image



Query image



The yellow box means the ground truth and the red box means our detection result.

Datasets	second-round detection	Accuracy
VOC2007	NO	43.51%
VOC2007	YES	45.72%
VOC2012	NO	45.62%
VOC2012	YES	47.42%
Methods	UIUC CAR (EER [1])	Caltech 101(Acc)
Sujoy [1]	90.76%	18.50%
Ours	79.38%	57.25%

1. Biswas, S.K., Milanfar, P.: One shot detection with laplacian object and fast matrix cosine similarity. IEEE Transactions on Pattern Analysis and Machine Intelligence 38(3), 546–562 (2016).

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