



## Lecture 14: Detecting Objects by Parts

# A simple object detector

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CS131 Computer Vision: Foundations and Applications



# What will we learn today?

- A simple object detector



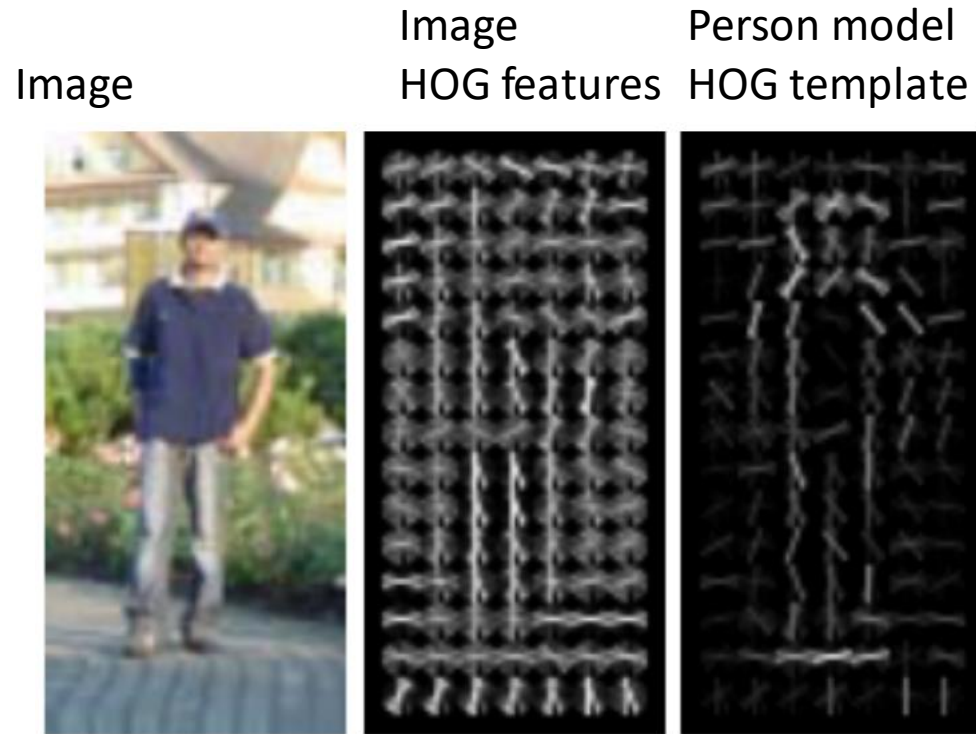
# Dalal-Triggs method



sliding window



# Recap – HOG features



- Find a HOG template and use as filter



# Sliding window + HOG features



No person here

- Slide through the image and check if there is an object at every location.
- Compare HOG feature template to HOG features from each location in the image.



# Sliding window + HOG features



YES!! Person match found

- Slide through the image and check if there is an object at every location.
- Compare HOG feature template to HOG features from each location in the image.
- If a comparison produces a high score, output detection at the corresponding location.



# Sliding window + HOG features



No bus found

- But what if we were looking for buses?





# Sliding window + HOG features



No bus found

- We will never find the object if we don't choose our window size wisely!





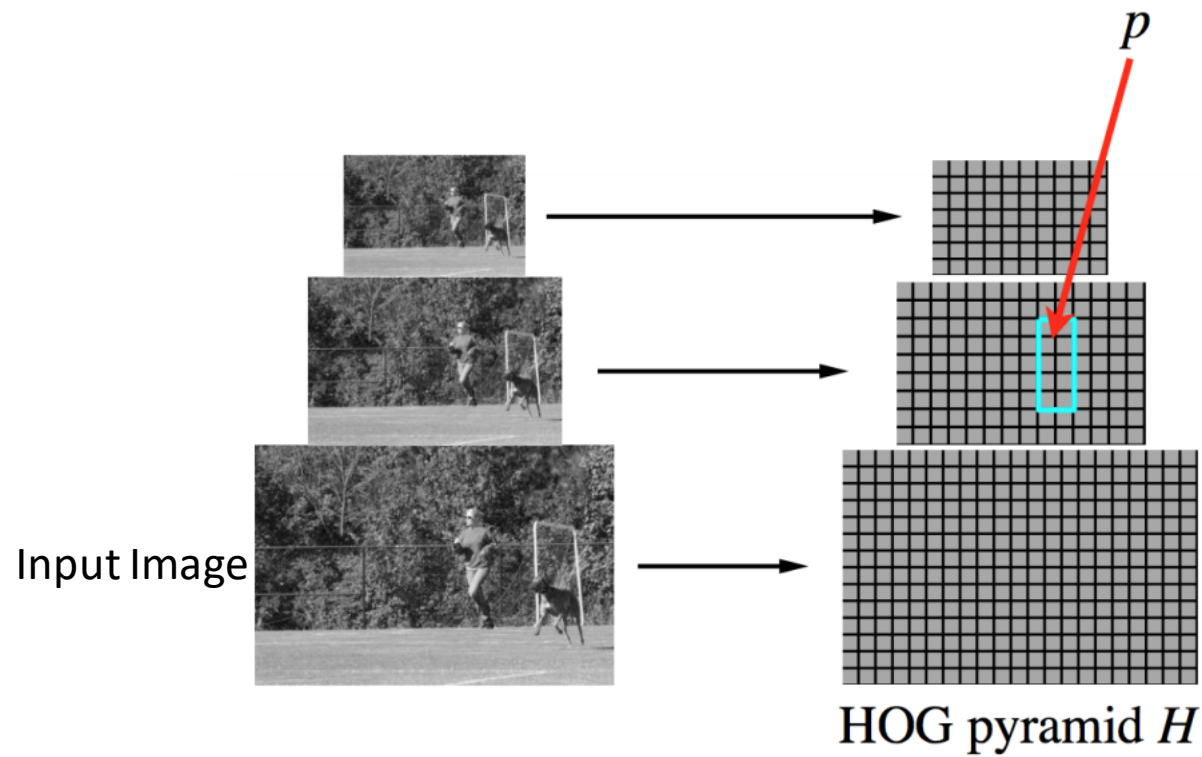
# Sliding window + HOG features



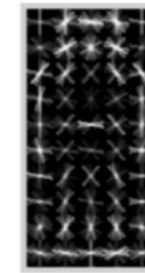
- We need to do **multi scale** sliding window



# Create a feature pyramid



Filter  $F$



Score of  $F$  at position  $p$  is

$$F \cdot \phi(p, H)$$

$\phi(p, H)$  = concatenation of  
HOG features from  
subwindow specified by  $p$



# Summary

- A simple object detector

