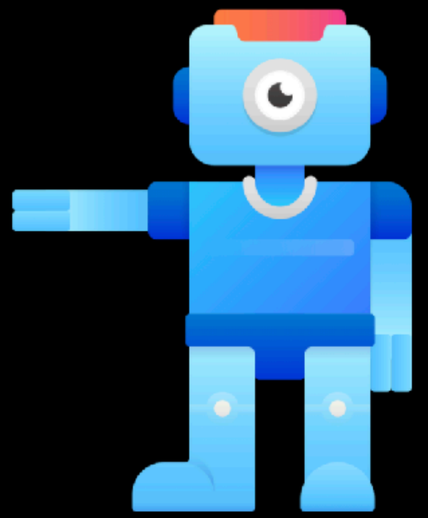


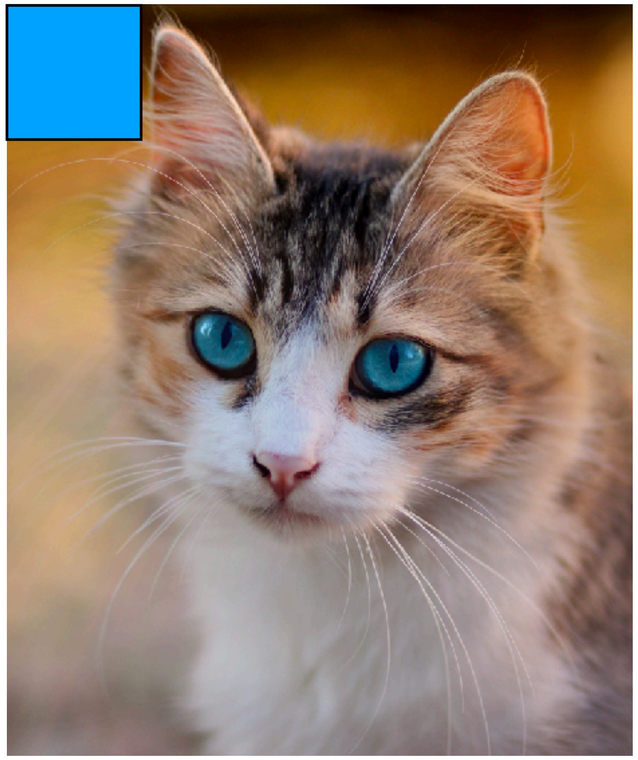
MODERN COMPUTER VISION

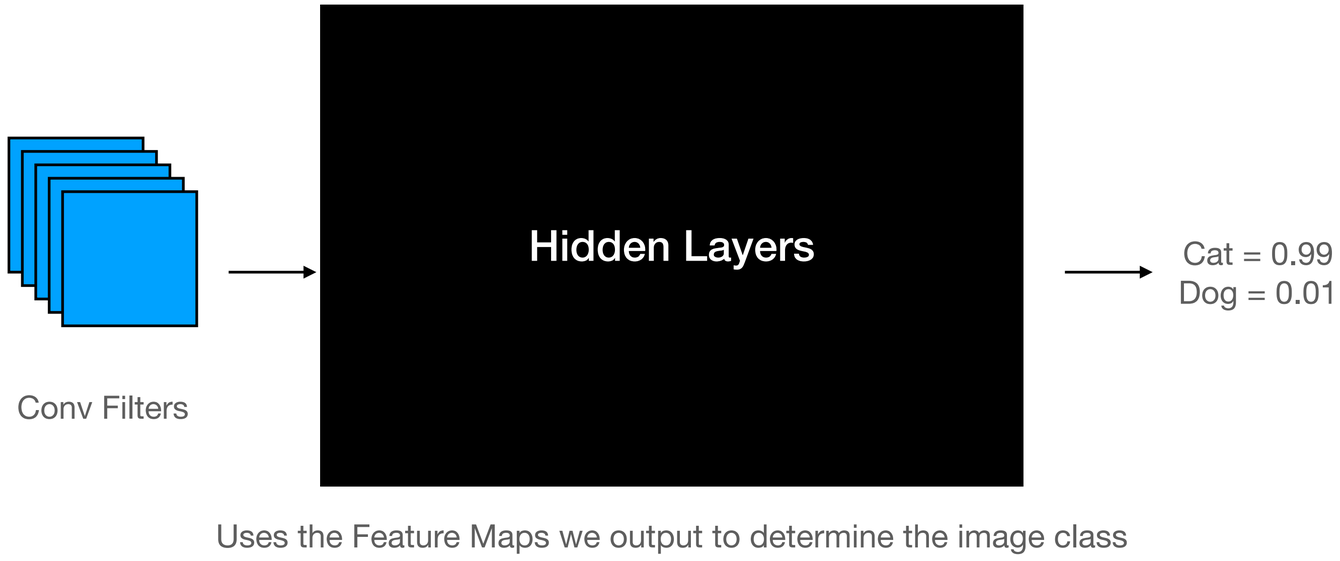
BY RAJEEV RATAN

Feature Detectors

How Feature Detectors Help Classify Images

How Classifiers Use Feature Detectors

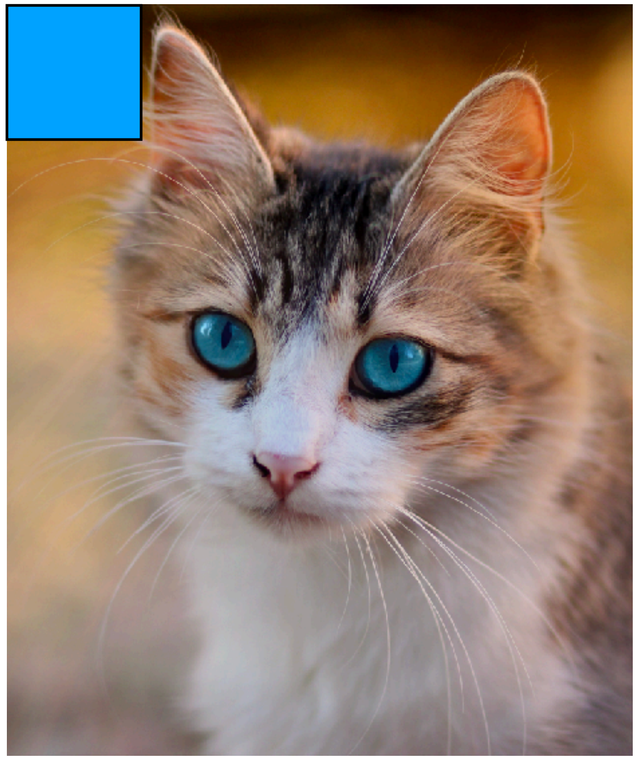


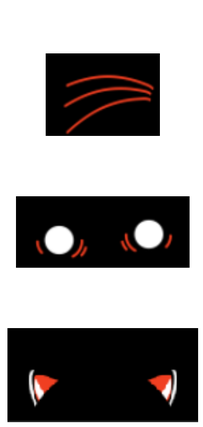


Uses the Feature Maps we output to determine the image class

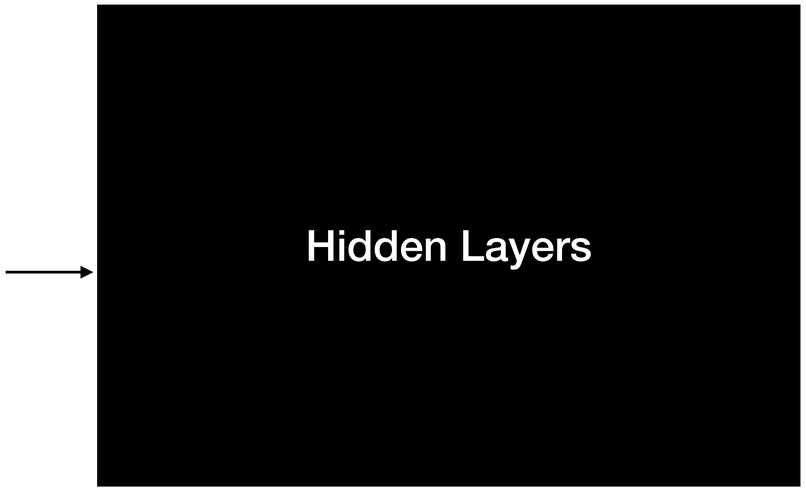
We perform Convolution operations with the input image and our filters

How Classifiers Use Feature Detectors





Conv Filters



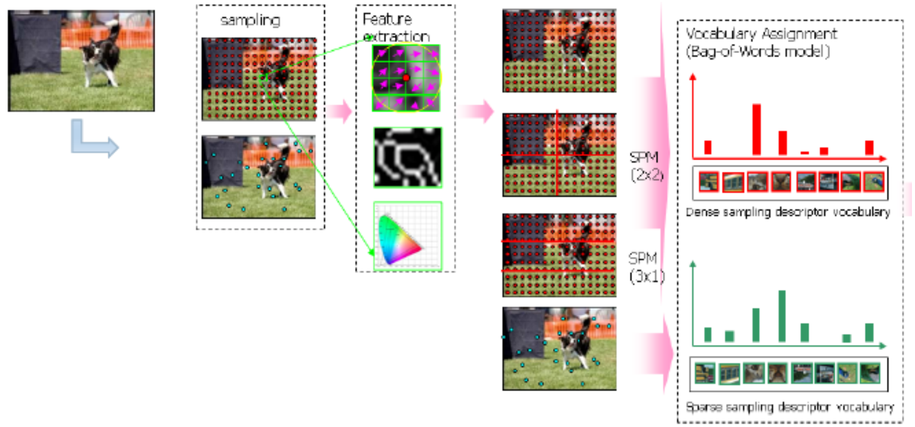
Uses the Feature Maps we output to determine the image class

Cat = 0.99
Dog = 0.01

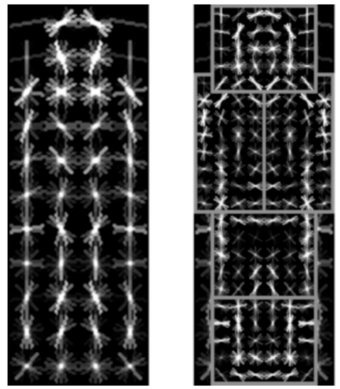
We perform Convolution operations with the input image and our filters

In the Past Hand Engineered Features Were Often Used

HoGs, SIFT, SURF, ORB, PHOG, Haar etc.



Yan & Huang
(Winner of PASCAL 2010 classification competition)

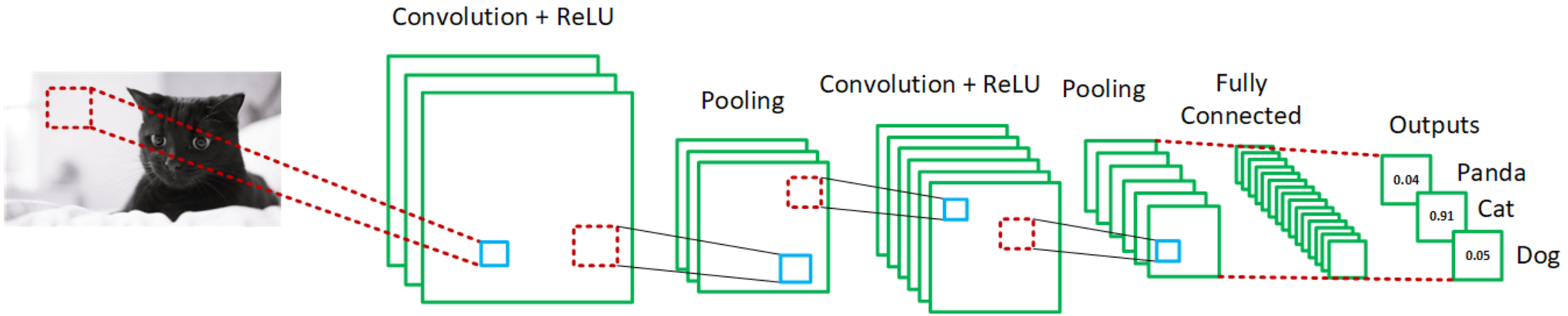


Felzenszwalb, Girshick,
McAllester and Ramanan, PAMI 2007

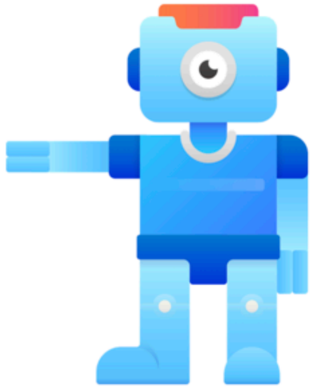
Hand crafting Features is VERY hard, messy and leads to often poor results…

CNNs solved this by having the ability to Learn Features

The Layers of a CNN



- Convolution
- ReLU
- Pooling Layers
- Fully Connected or Dense Layer
- Output



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Next...

Convolution on Color Images