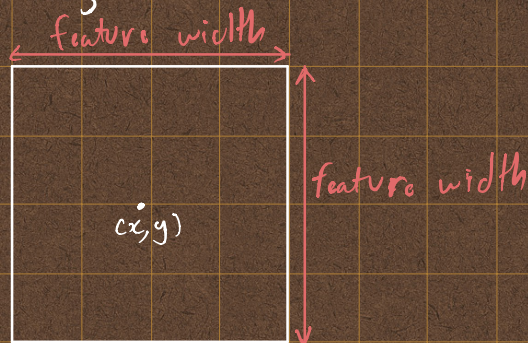
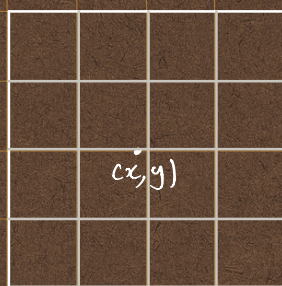


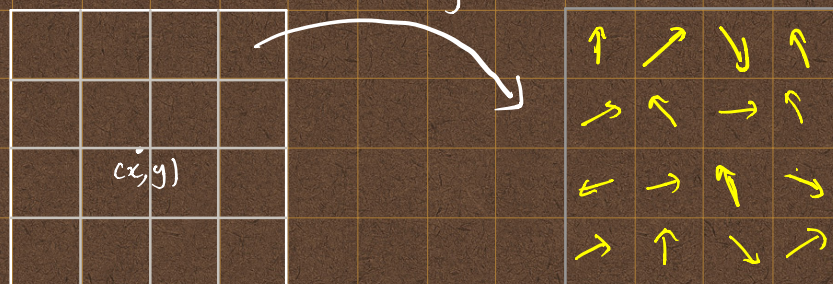
For each interest point  $(x, y)$  in image  $I$ ,  
→ extract a block of size feature width centered around  $(x, y)$



→ divide it into  $4 \times 4$  cells:



→ for each cell, look at gradient directions for each pixels. (note these are actually numbers. Shown as arrows here.)



→ Make a histogram. The histogram has 8 bins.



1	2	3	4	5	6	7	8

where bin number  $n$  denotes the bin contains magnitudes corresponding to angles from

$$\frac{(n-1)\pi}{4} - \frac{n\pi}{4} \text{ rad}$$

→ Put the sum of the magnitude corresponding to angles in each range. (Here I have used  $\nabla I * g(\sigma)$ )

↑ Gaussian with some sigma

→ Concat all these histograms. So, for each interest point, we end up in  $4 \times 4 \times 8 = 128$  bins (dimensions)