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Quiz 2

1.1 The Hessian as a Measure of Cornerness.
when we have eigen values λ_1 and λ_2 and they both are large, we can conclude that we are at a corner because E, the margin of error, increases in all direction.

1.2 How can we detect flat region? If both eigen values are small λ_1 and λ_2, then we are at a flat region. why? Because E will always be approx. constant in all direction.

1.3 Suppose we have eigen value λ_1 and λ_2, the difference would be that λ_1 will be significantly bigger in comparison to λ_2. Therefore it can be considered an edge.

1.2 A definition of H that relies on H is
det (H) / trace (H) as you are using the λ_1 and λ_2 to compute and determine H where it is simple math, no squares & square roots Like the previous question, you don't have to go through all the eigen computations. This is faster to compute yet similar to minimum-eigenvalue scoring func.

1.3 Traverse through each pixel, compute eigen values, using it to find cornerness. As said in the lecture, if two pixels are the same, record only one. This way you are reducing the amount of noise in the image and in a way smoothing the image out.

2. Scale - Invariant Harris Corners

When you are ~~are trying~~ to use Harris' corner detector, you are looking for significant change in all directions. Imagine a window W around some image. Lets inspect how the pixels change inside this image and compare the difference before and after the move to get a sum of error. If that error is particularly high, we have detected a corner.

The H matrix tells us about the landscape of the error signal in the local region of the image. H matrix is buscially the linear algebra / short hand version of $E(u,v) \approx Au^2 + 2Buv + Cv^2$

Because its a 2×2 matrix, you are looking at a quadratic bowl

To detect corners we will modify our λ_1 & λ_2
To define f, we use the det and trace of the 2×2 matrix.