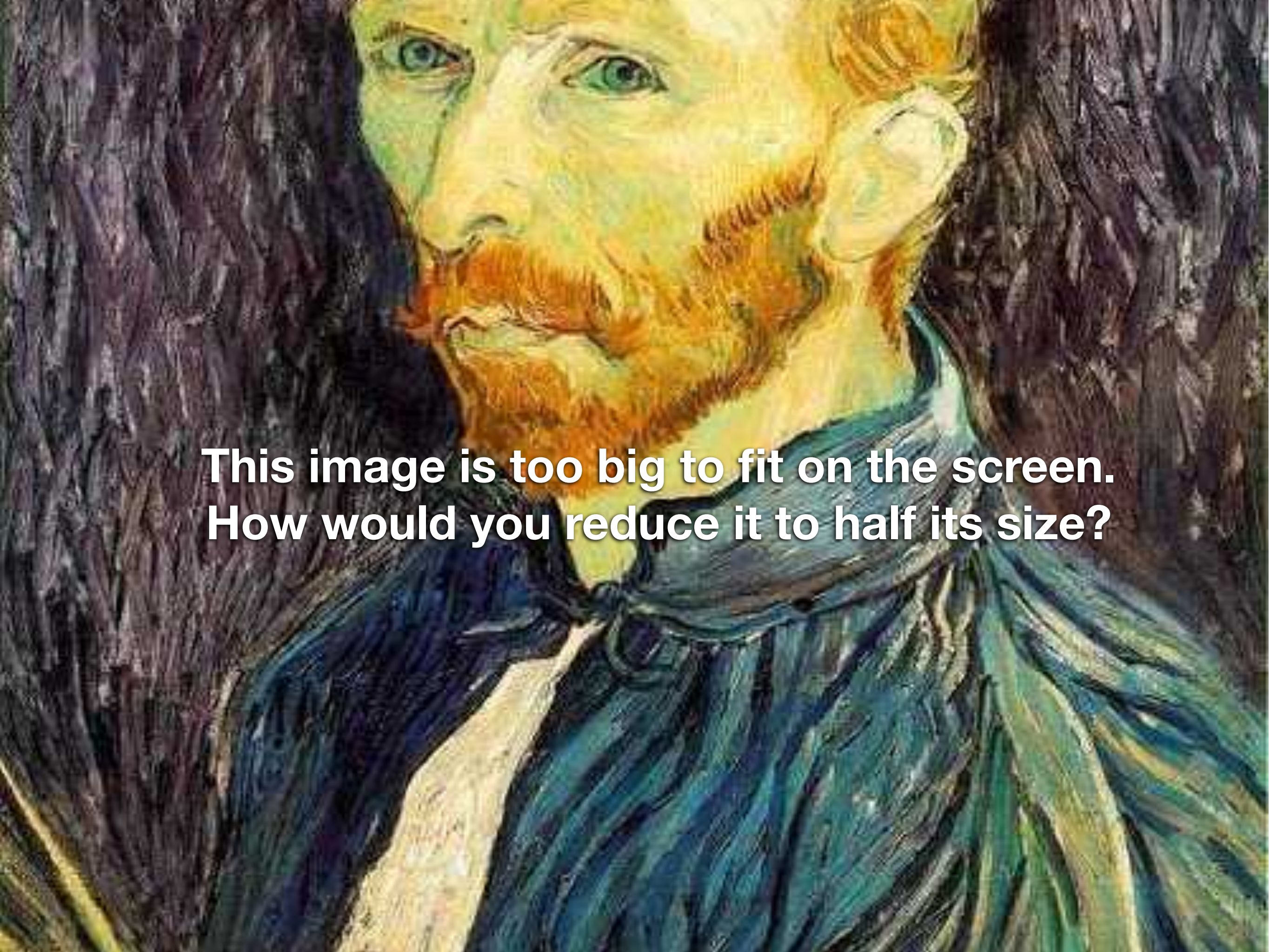




Image Subsampling

Computer Vision

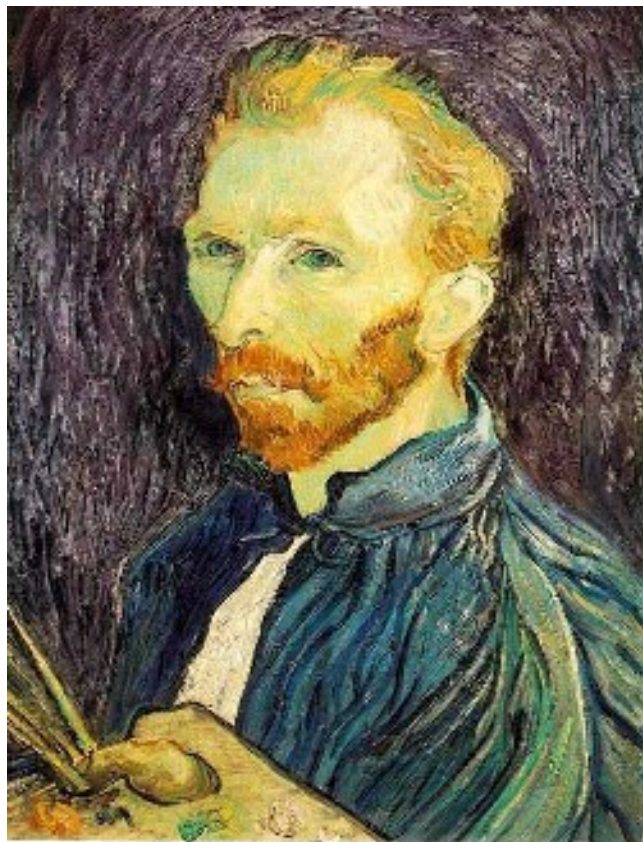
Carnegie Mellon University (Kris Kitani)

A close-up of a painting of a man with a beard and blue eyes, wearing a dark blue garment. The painting is characterized by thick, visible brushstrokes and a rich, textured background. The man's face is the central focus, with his eyes looking slightly to the left. His beard is a mix of orange and brown tones. The background is a dark, swirling pattern of purple and blue.

**This image is too big to fit on the screen.
How would you reduce it to half its size?**

Naive image sub-sampling

‘throw away even rows and columns’



1/2

delete even rows
delete even columns



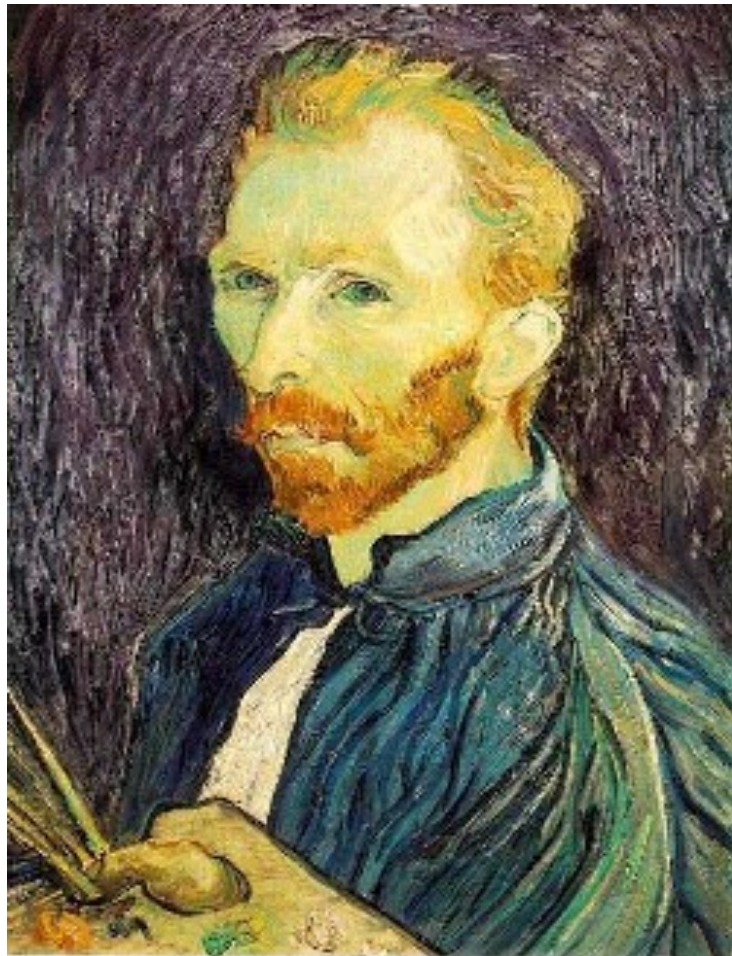
1/4

delete even rows
delete even columns



1/8

What are the problems with this approach?



1/2



1/4 scaled by 2

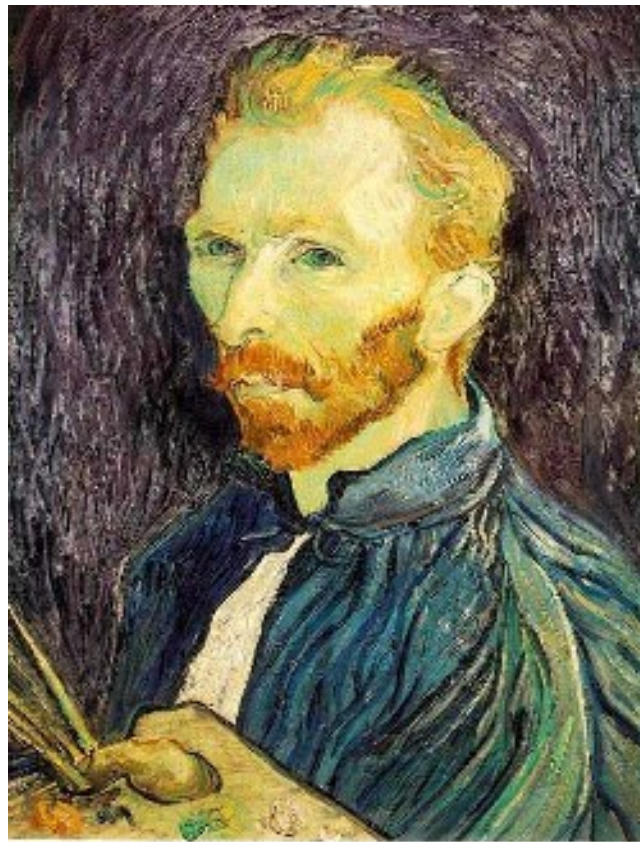


1/8 scaled by 4

Why is the 1/4 image so blocky (pixelated, aliased)?

How can we fix this?

Add Gaussian (lowpass) pre-filtering



1/2

Gaussian filtering
delete even rows
delete even columns



1/4

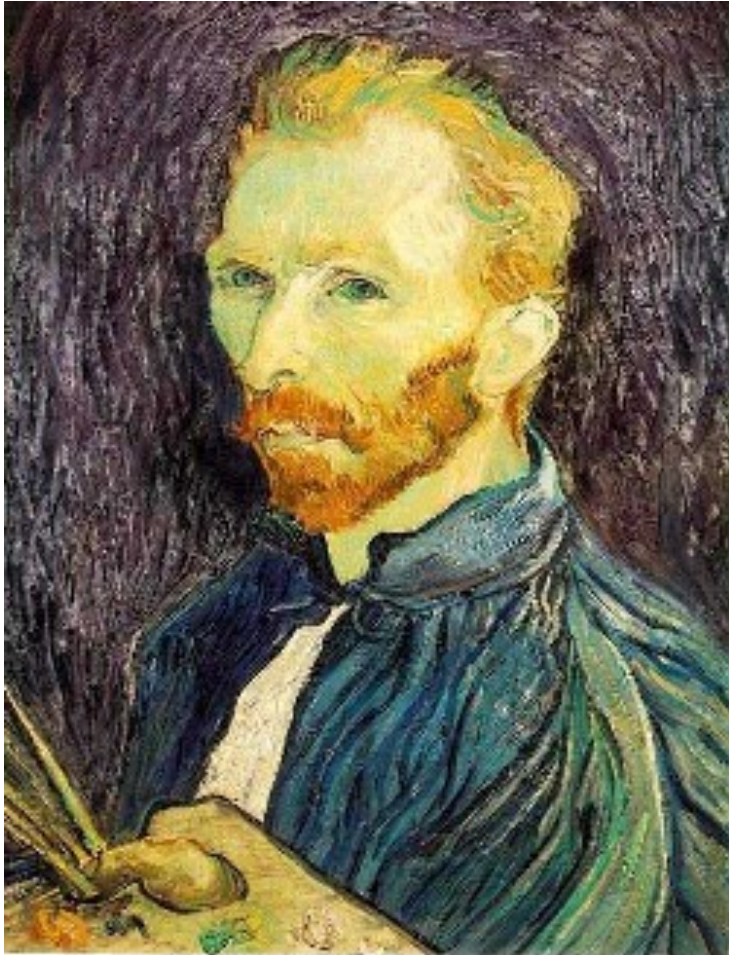
Gaussian filtering
delete even rows
delete even columns



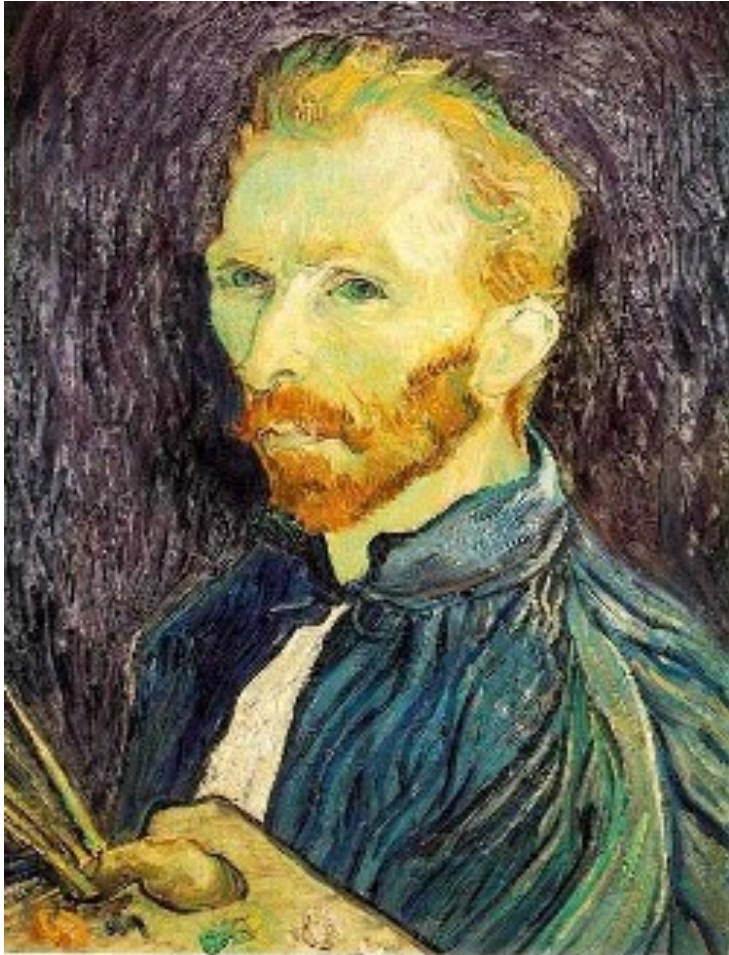
1/8

What will the images look like scale to the same size?

Gaussian pre-filtering



Naive subsampling





This sequence of subsampled images is called the...

Gaussian image pyramid