Image Subsampling

16-385 Computer Vision (Kris Kitani)

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

Naive image sub-sampling

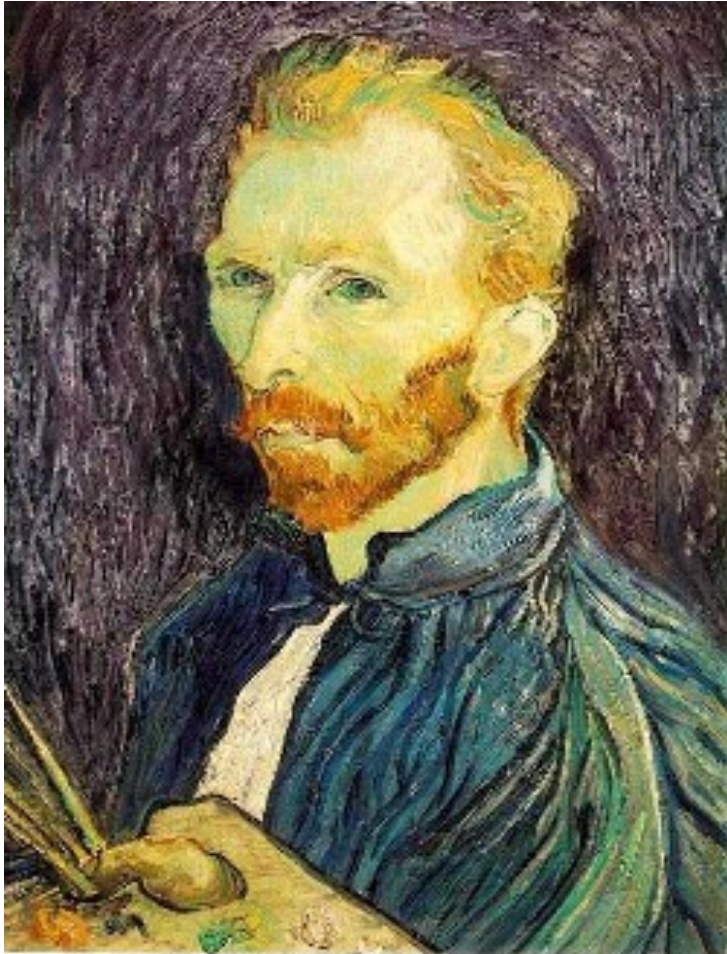*'throw away even rows and columns'*
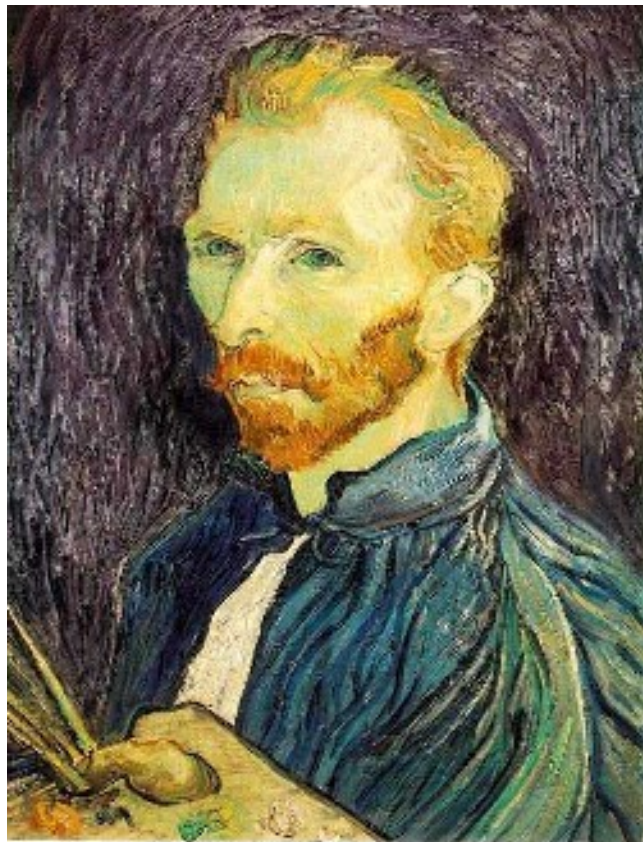
delete even rows
delete even columns

delete even rows
delete even columns

1/8

1/4

1/2

What are the problems with this approach?
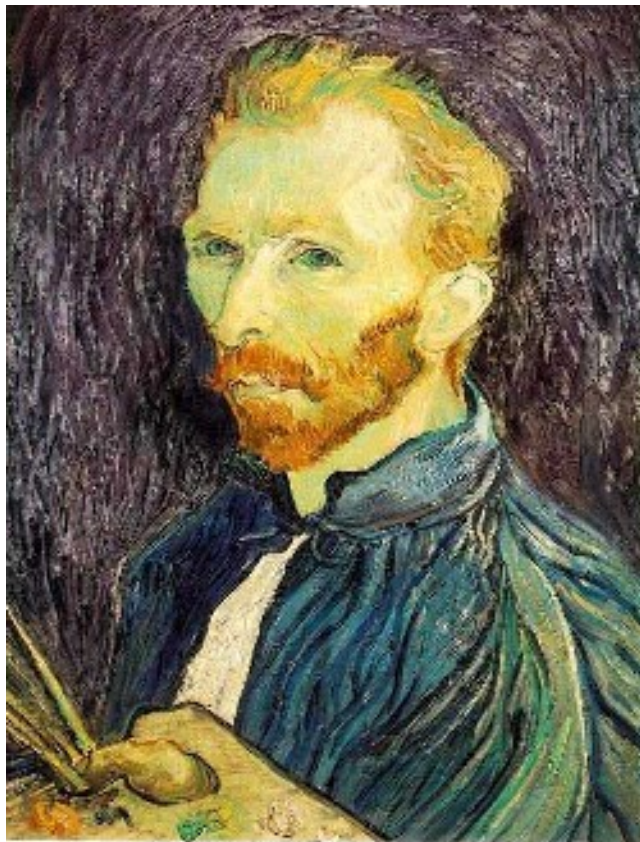
| 1/2 | 1/4 scaled by 2 | 1/4 scaled by 4 |

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
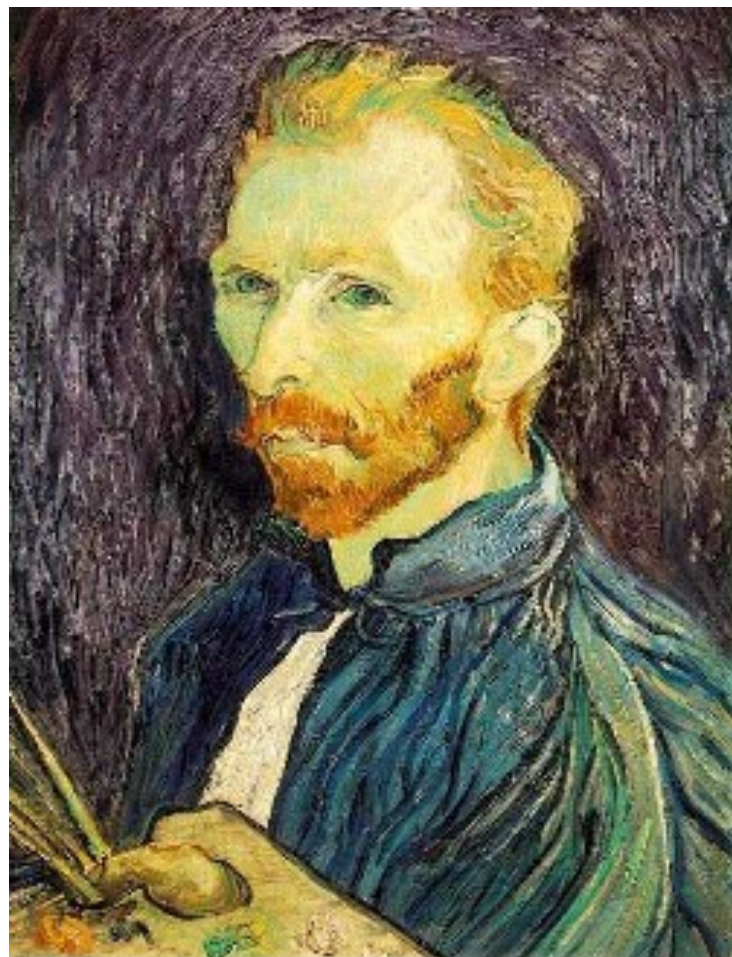delete even columns

1/4

Gaussian filtering
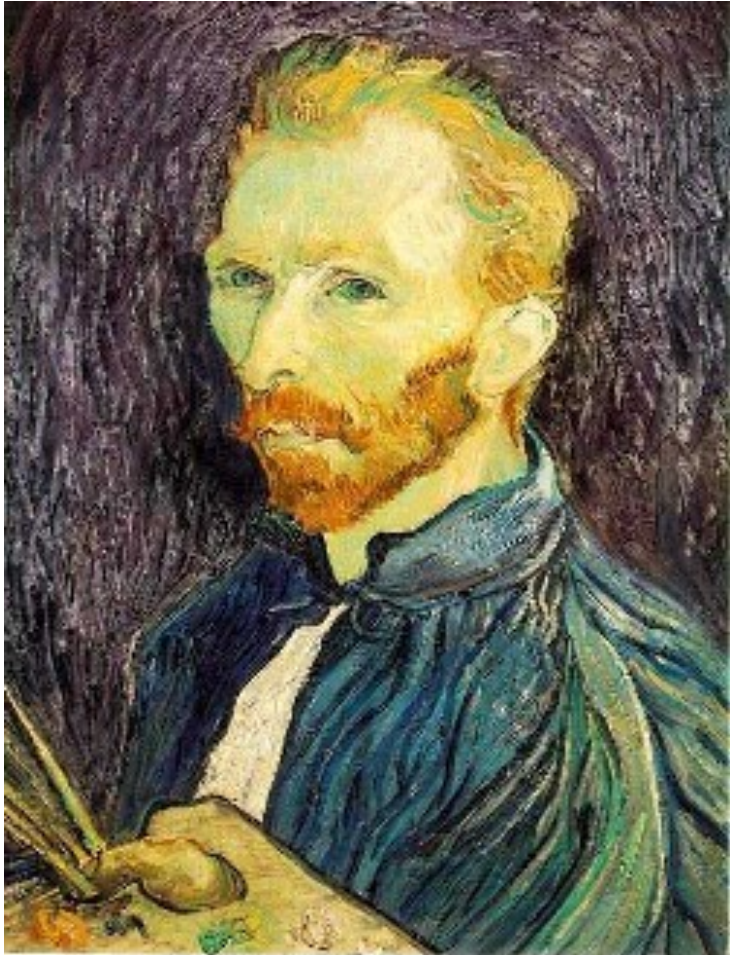delete even rows
delete even columns

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