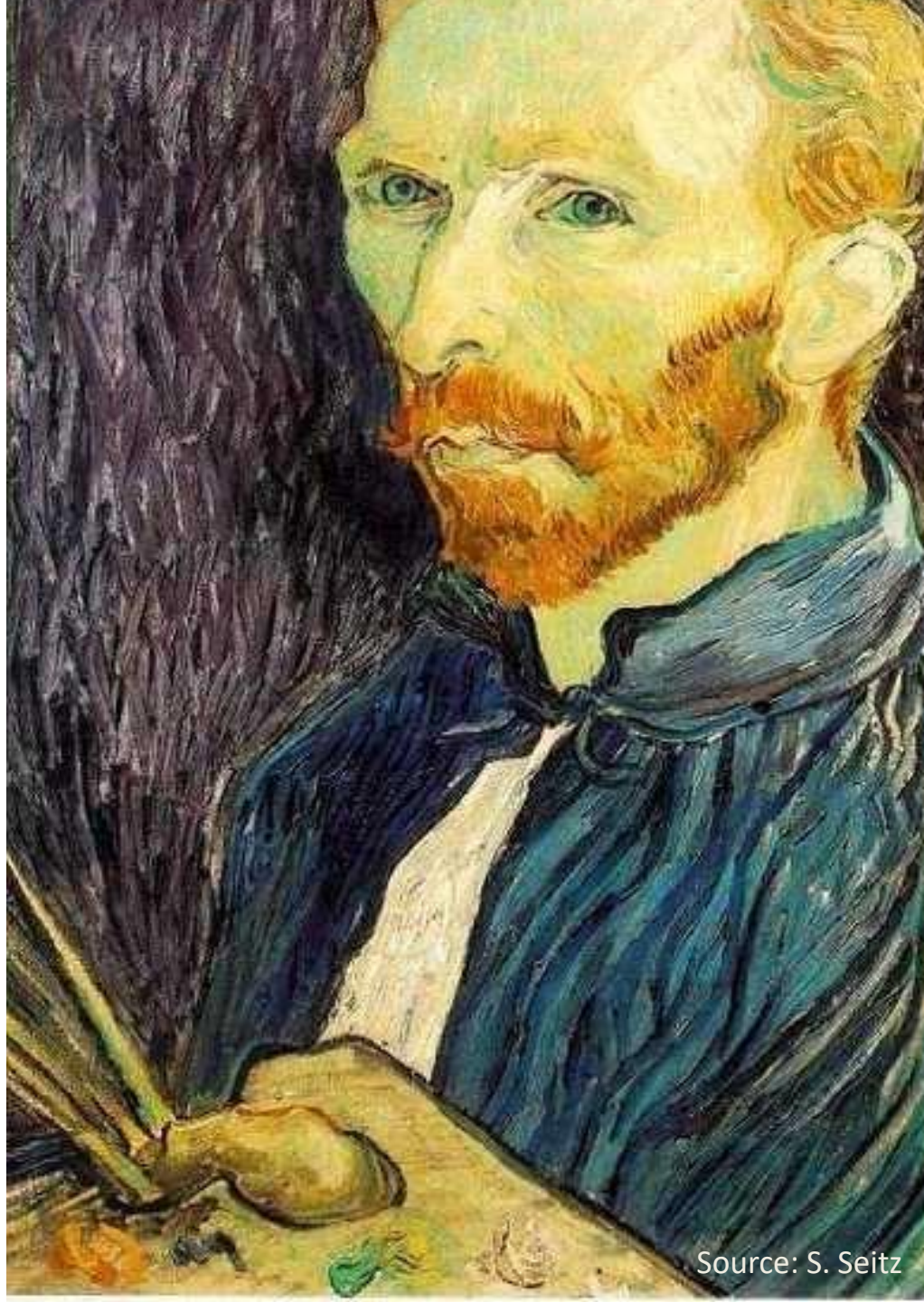


# Image Resampling

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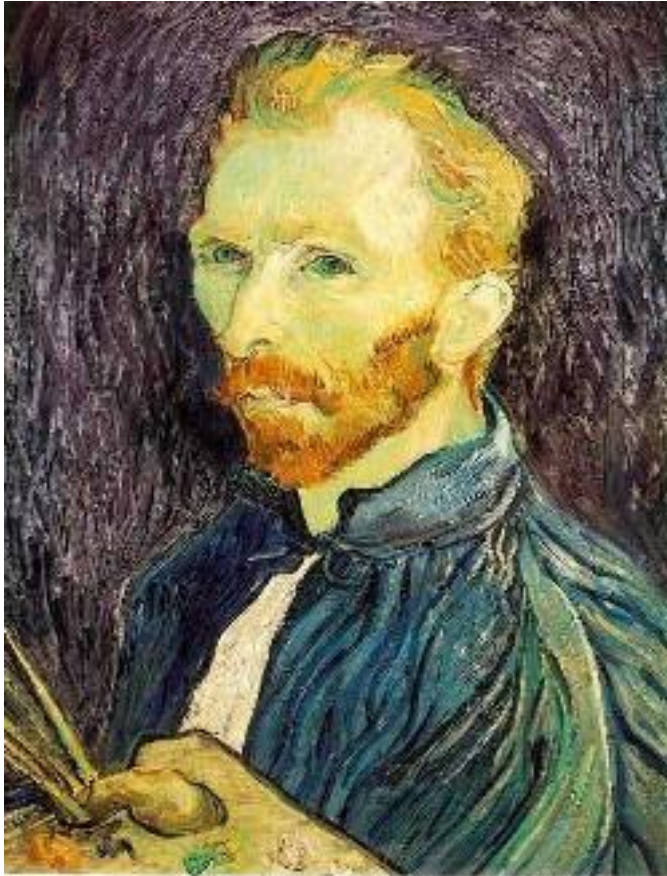
# Image Scaling

This image is too big to fit on the screen. How can we generate a half-sized version?



Source: S. Seitz

# Image sub-sampling



1/4

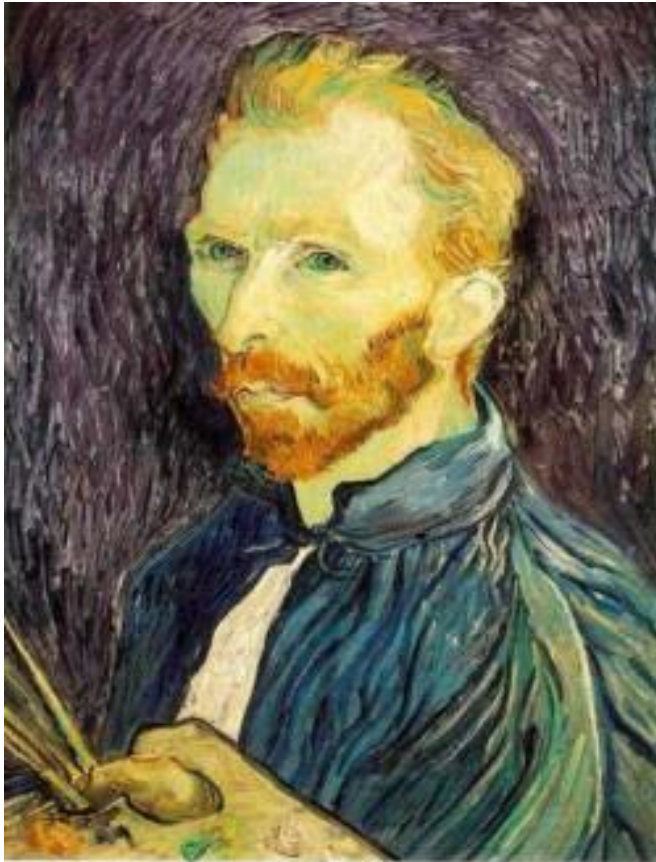


1/8

Throw away every other row and column to create a smaller size image  
- called *image sub-sampling*



# Gaussian pre-filtering



Gaussian 1/2



G 1/4



G 1/8

- Solution: filter the image, *then* subsample

# Subsampling with Gaussian pre-filtering



Gaussian 1/2



G 1/4

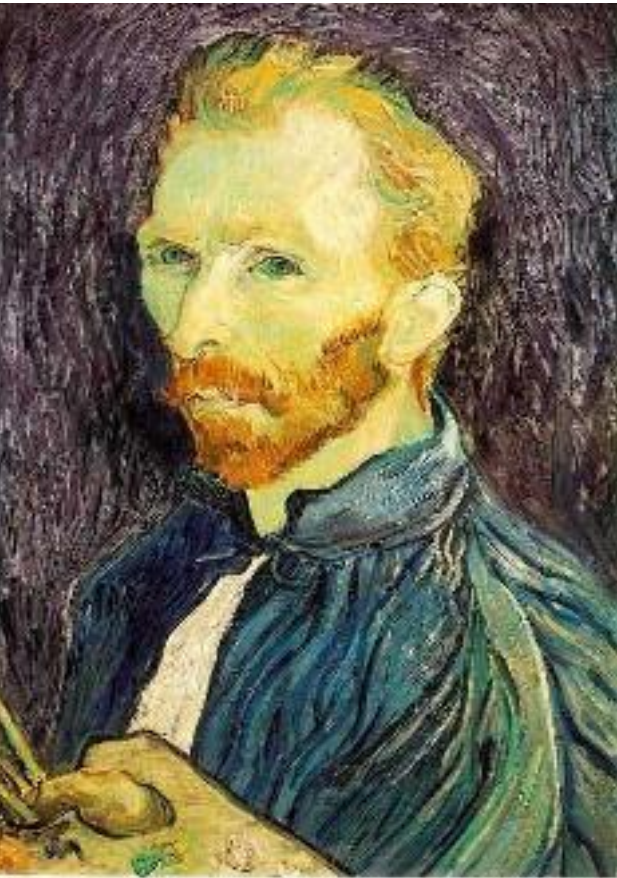


G 1/8

- Solution: filter the image, *then* subsample



# Compare with...



1/2



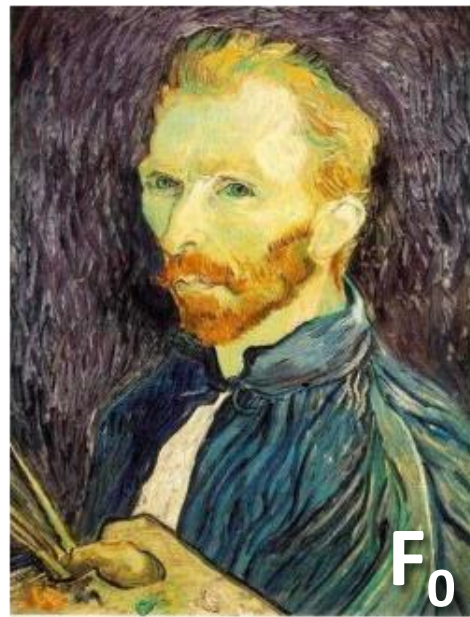
1/4 (2x zoom)



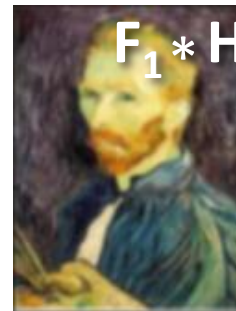
1/8 (4x zoom)

# Gaussian pre-filtering

- Solution: filter the image, *then* subsample

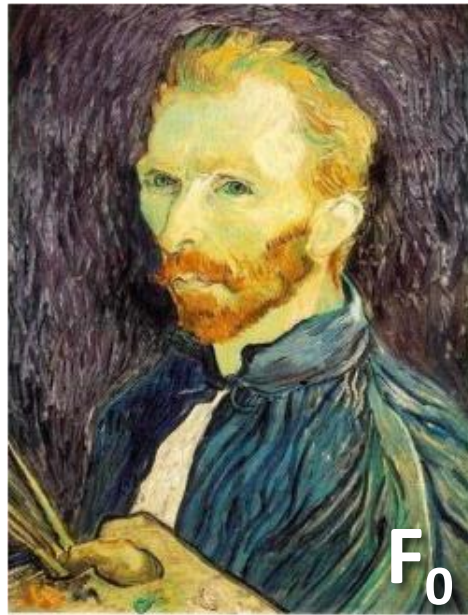
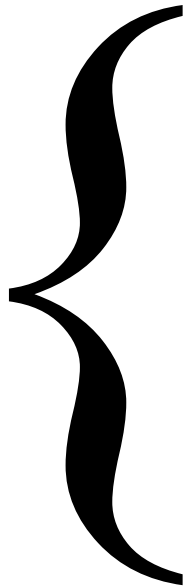


...





*Gaussian  
pyramid*



blur



subsample

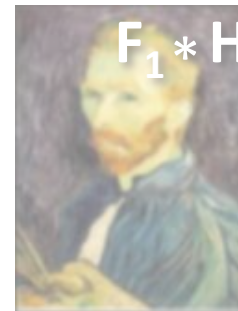


blur




subsample

...





# Upsampling

- This image is too small for this screen: 
- How can we make it 10 times as big?
- Simplest approach:
  - repeat each row
  - and column 10 times
- (“Nearest neighbor interpolation”)

