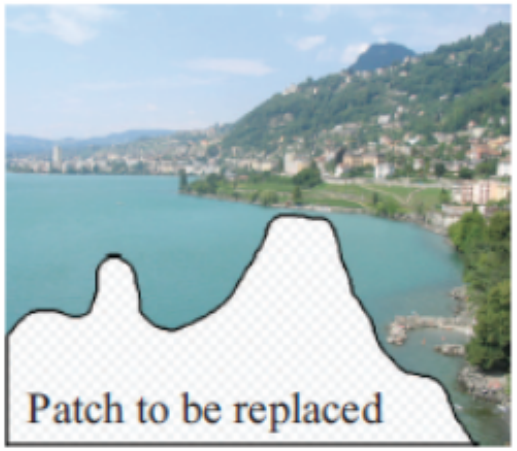
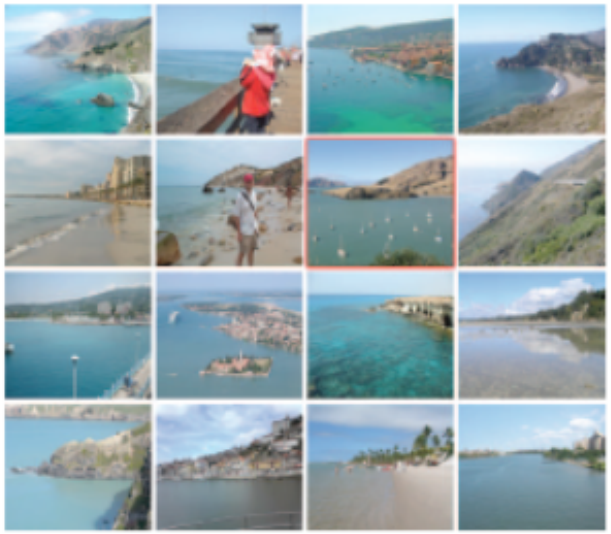
Some applications of regression and neighbors

Principle: Nearest Neighbors

- (x, ?)
  - Find nearest neighbor (x_n, y_n)
  - report y_n
- Applications
  - classification
  - regression
- Advantages
  - startlingly accurate with enough data
  - easy, even in cases that might look hard
- Disadvantages
  - you have to be able to find the nearest neighbor



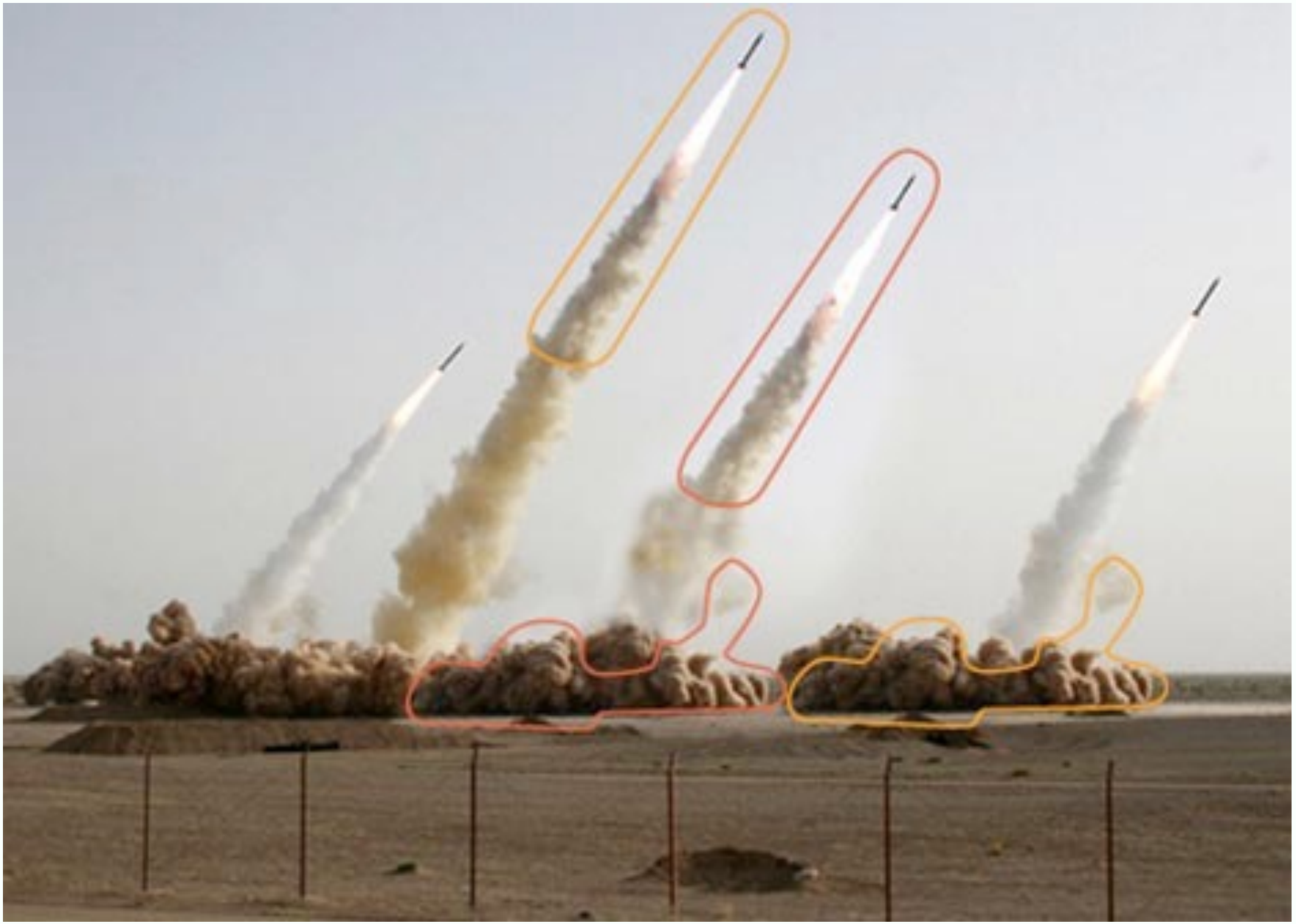


Matched Images

Initial image

Final composited image

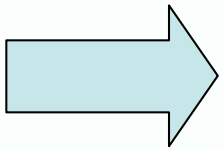
Texture scandals!!



Bush campaign digitally altered TV ad

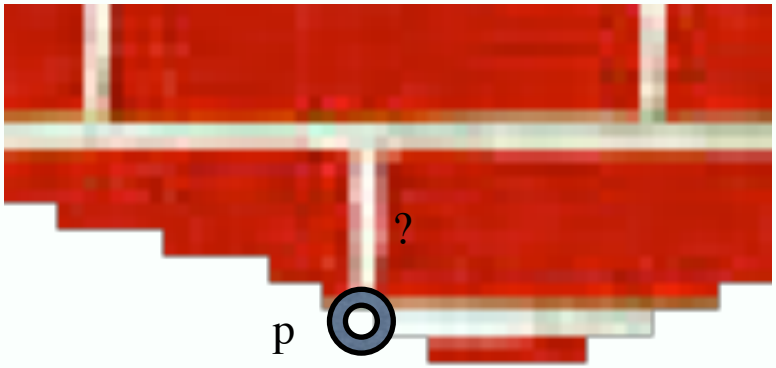
President Bush's campaign acknowledged Thursday that it had digitally altered a photo that appeared in a national cable television commercial. In the photo, a handful of soldiers were multiplied many times.

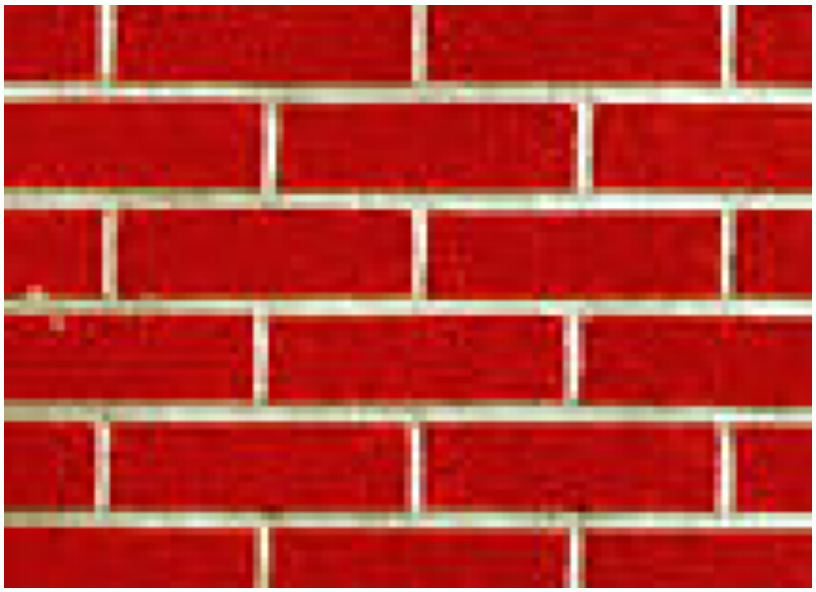
Texture Synthesis



Efros & Leung ICCV99

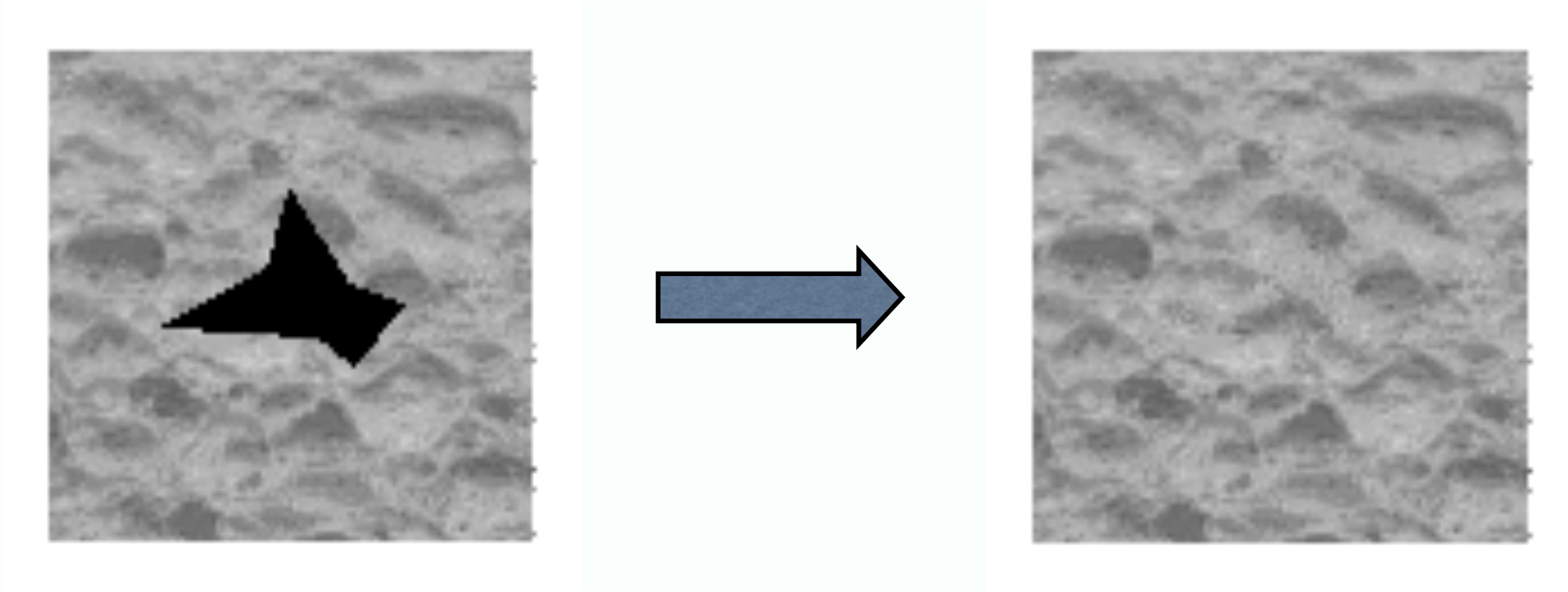
How to paint this pixel?



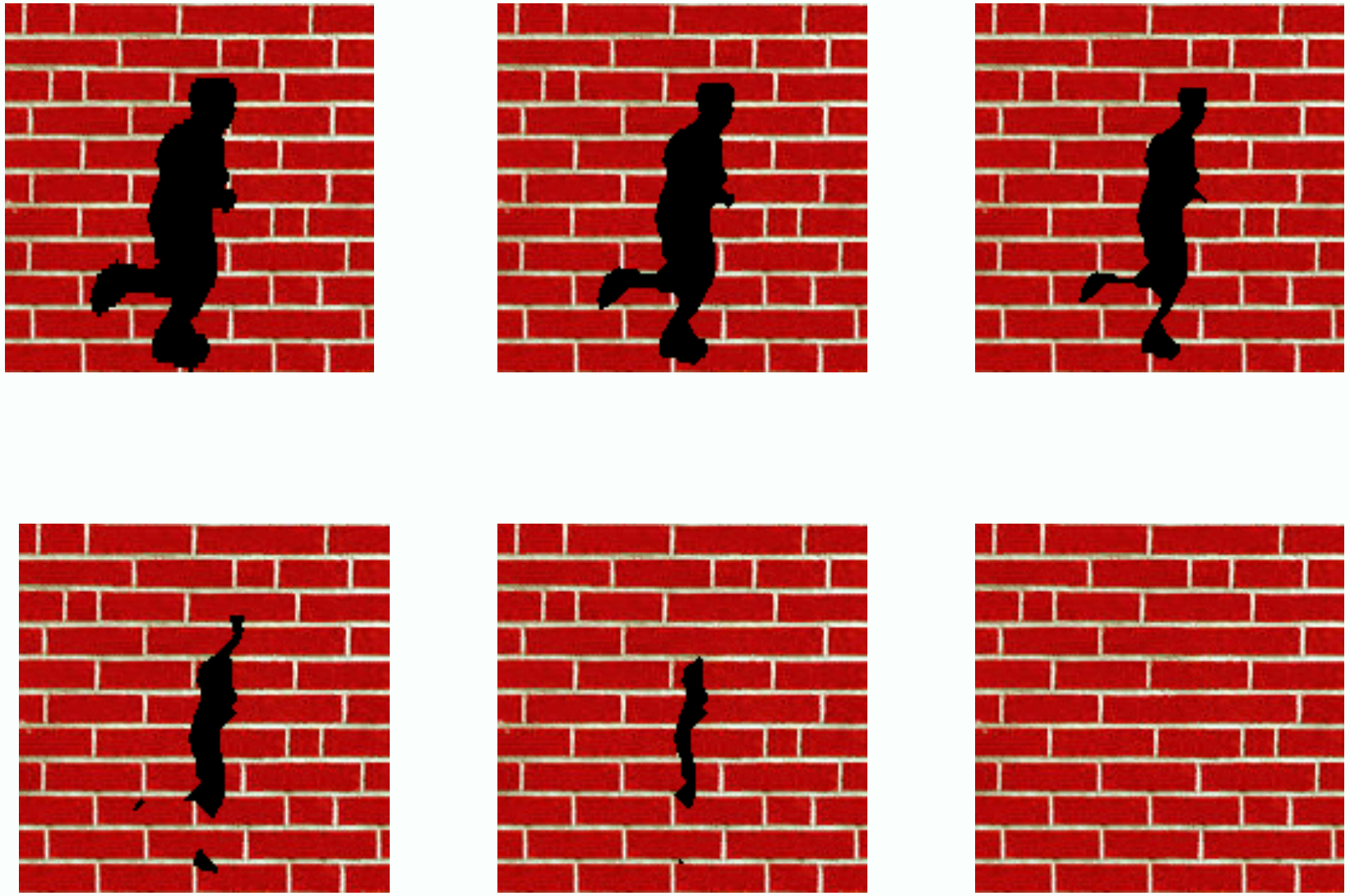


Input texture

Growing Regions
Hole Filling



Hole Filling



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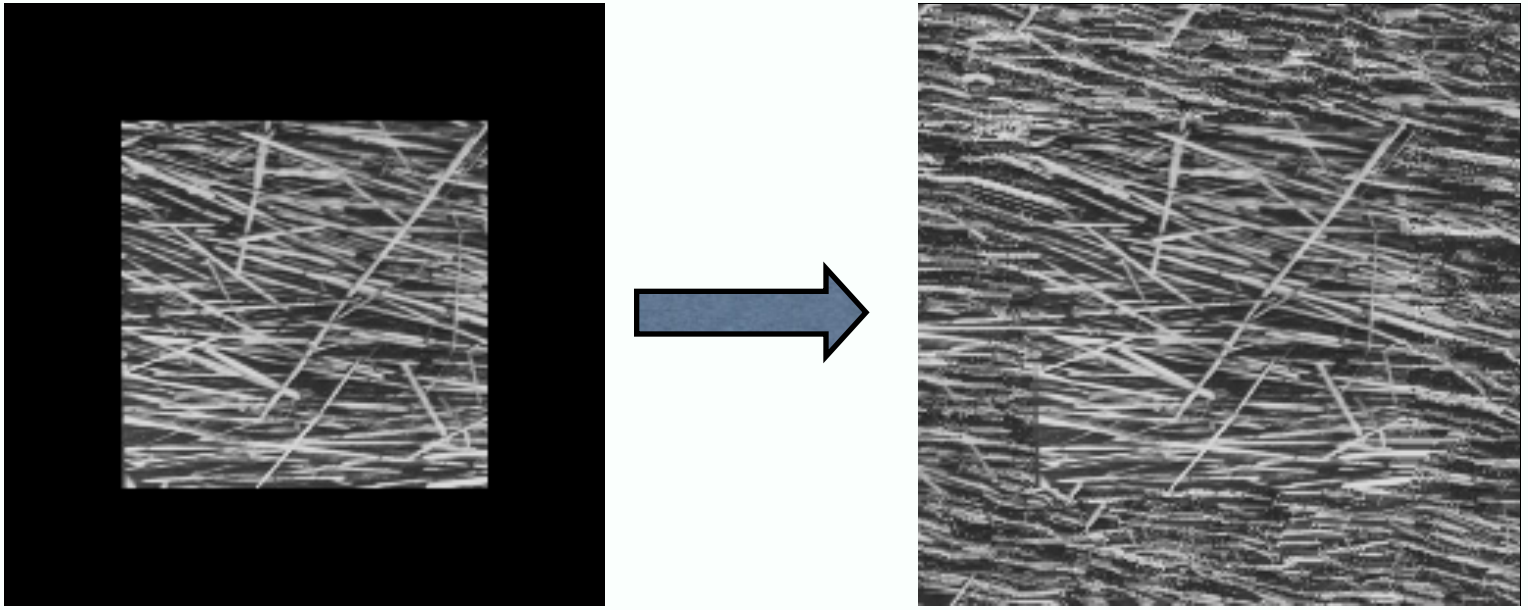
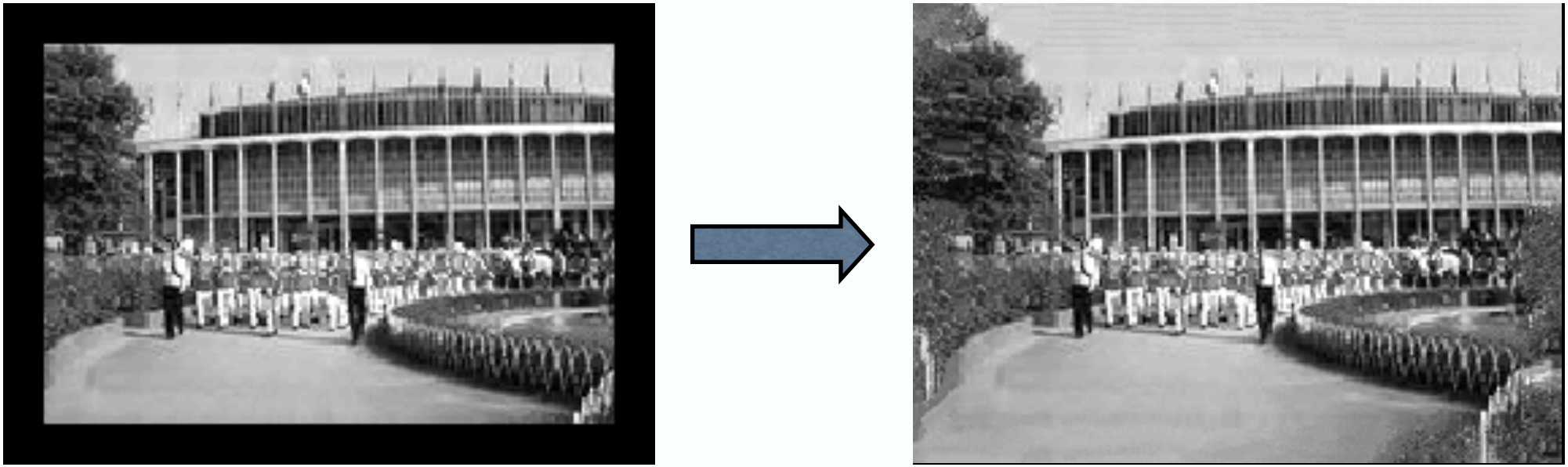
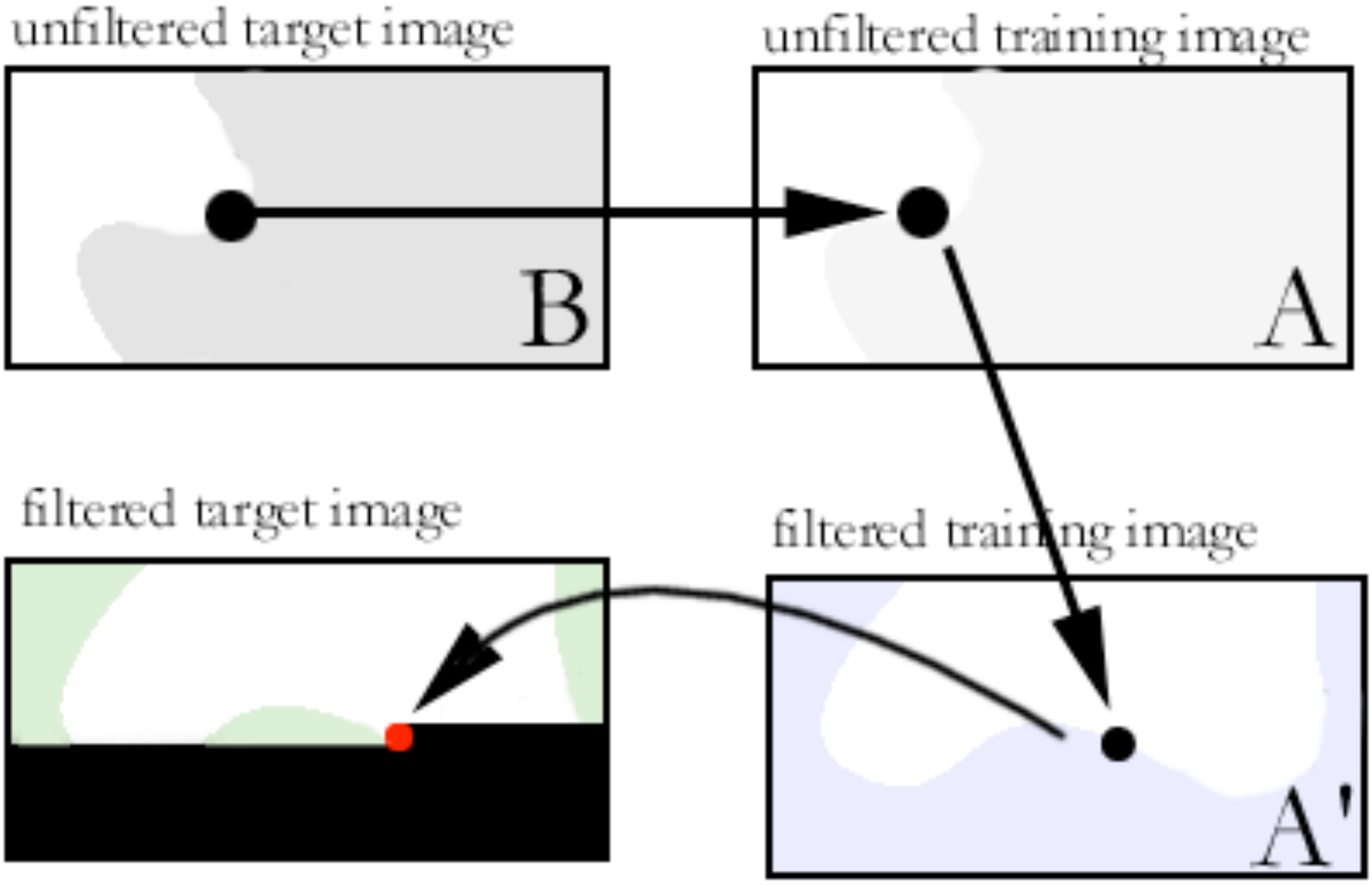
Extrapolation





Efros & Leung ICCV99

Image Analogies



Hertzman, Jacobs, Oliver, Curless, and Salesin, SIGGRAPH01

Training

Unfiltered source (*A*)

Filtered source (*A'*)

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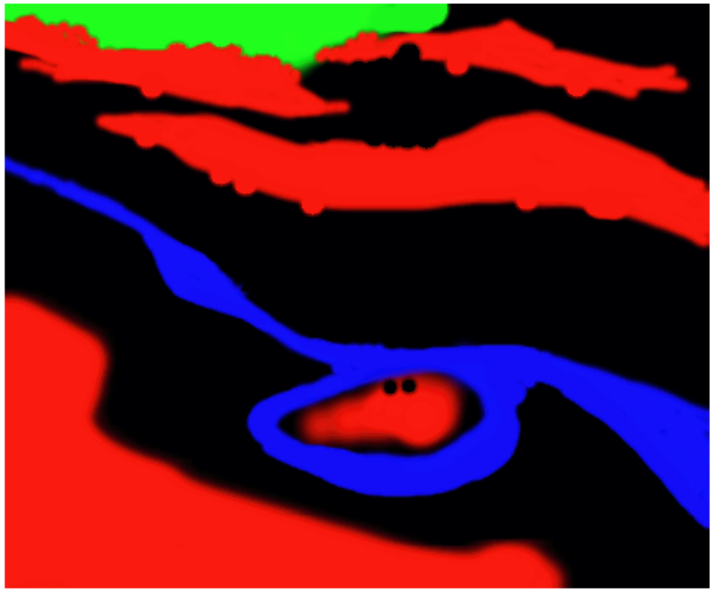
Texture by Numbers

Unfiltered source (A)

Filtered source (A')



Unfiltered (B)

Filtered (B')

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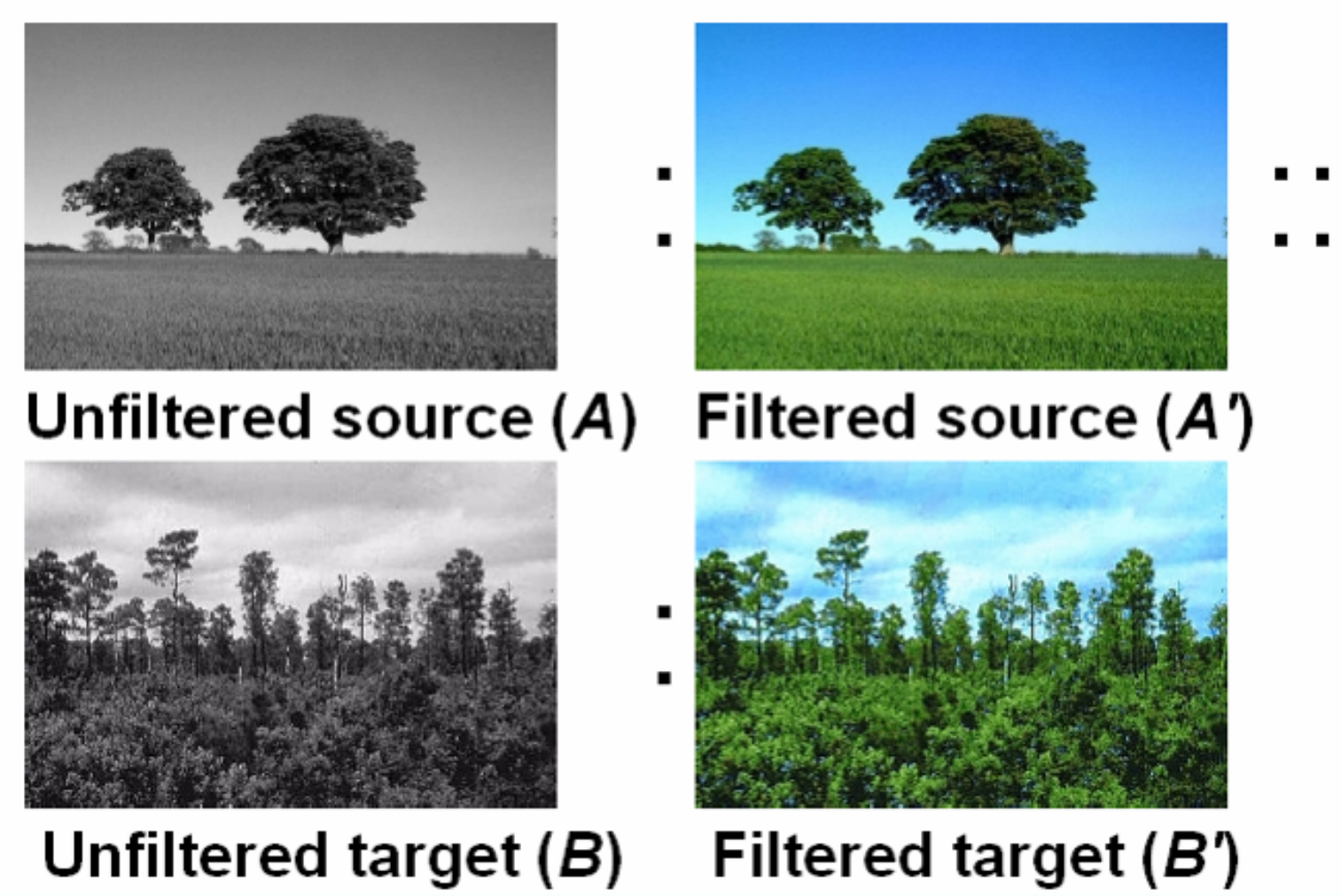
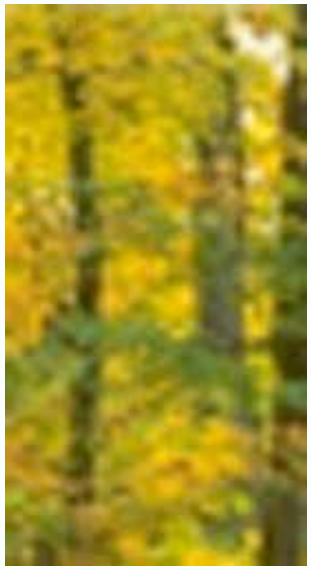
Colorization



Hertzman, Jacobs, Oliver, Curless, and Salesin, SIGGRAPH01

Super-resolution



A

A’

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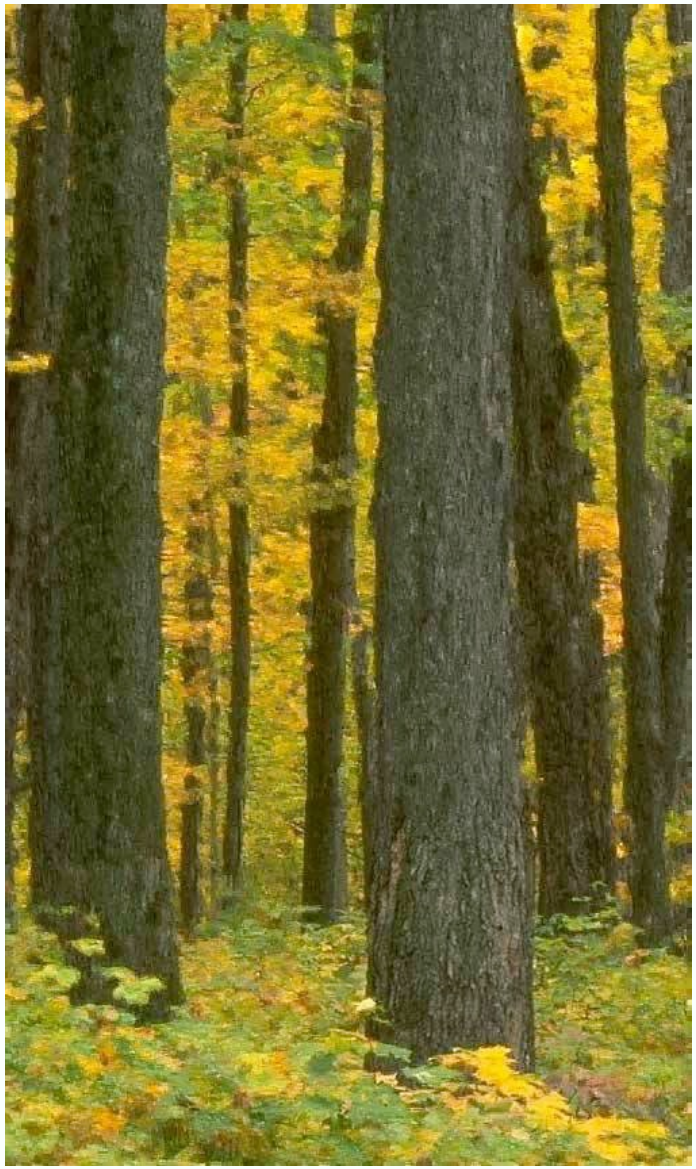
Super-resolution (result!)

B



B’

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Training images

::

:

B

B’