Super resolution NNs

Mustafa Hajij

One line description of super-rez NNs

Low res

NN

High res

Easy things first

How to get the data?

Process with an image processing software to make a lower version of it

Start with high rez image :

yi

xi

Easy things first

How to get the data?

Start with high rez image :

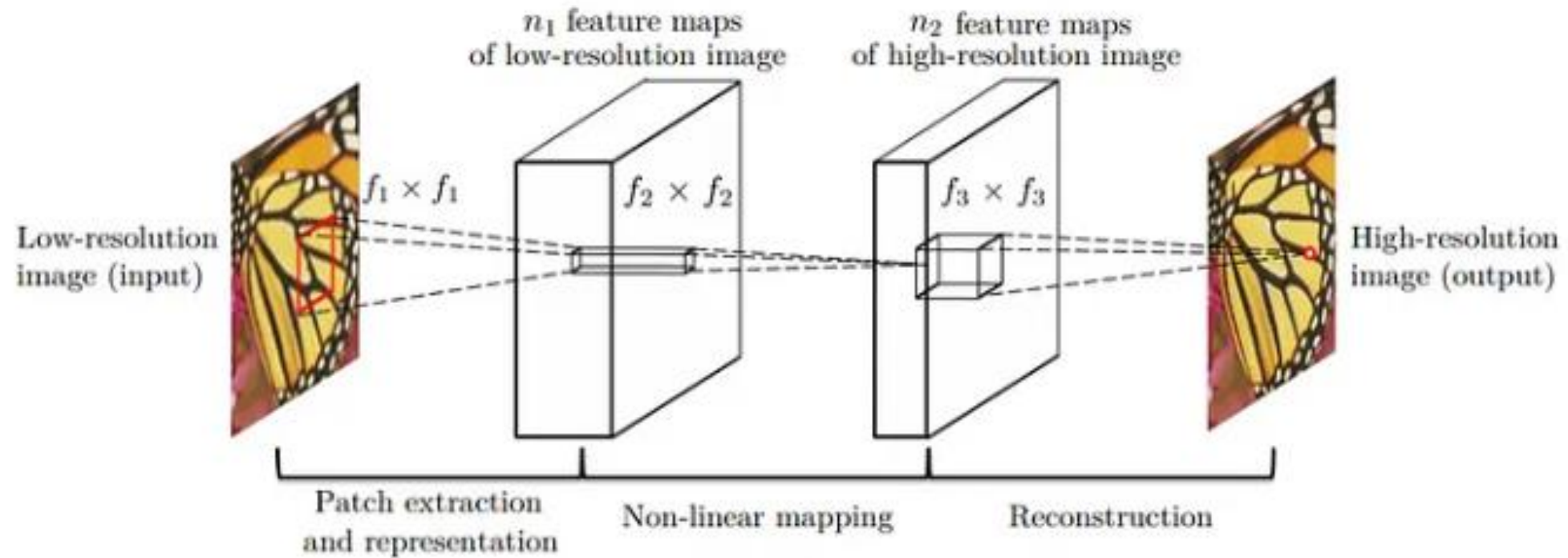Process with an image processing software to make a lower version of it

yi

xi

For the pairs (xi,yi) and a fit a model xi->f(xi)   with the regression loss function L = ||f(xi)-yi||
Which penalizes the deviation of the prediction f(xi) from the original super rez image yi

Easy things first

How do we choose f?

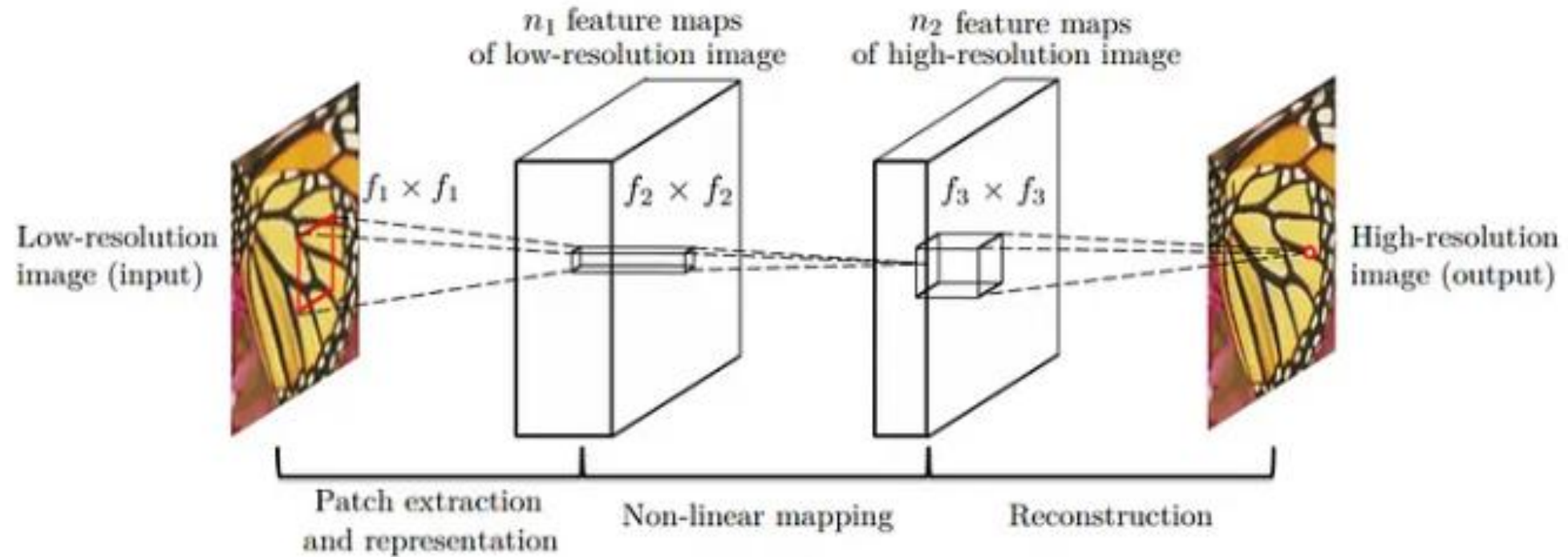**SRCNN**

Easy things first

How do we choose f?

SRCNN

n_1 feature maps of low-resolution image

n_2 feature maps of high-resolution image

Low-resolution image (input)

$f_1 \times f_1$

$f_2 \times f_2$

$f_3 \times f_3$

High-resolution image (output)

Patch extraction and representation

Non-linear mapping

Reconstruction

Key point about the architecture : it has to move the volume of the input to the volume of the output via a sequence of other volumes to perform the computations : it has a to be a fully-conv network!

SRCNN

Easy things first

To answer HW2 last question read: **SRCNN**