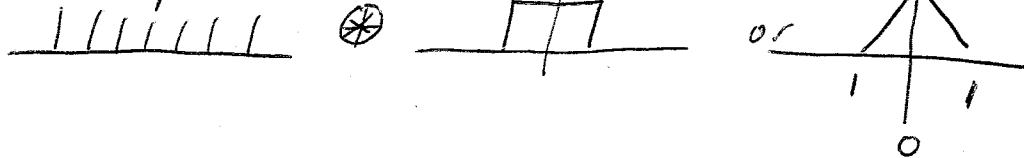


Reconstruction Theory

- ① make a signal w/ spikes
LPP to get signal w/ no HF



- ② In practice

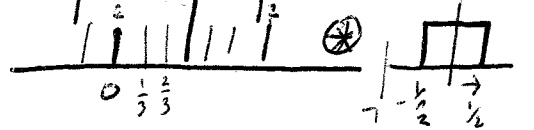


Resampling - only evaluate this at particular places

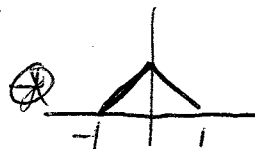
Upscaling

bigger by factor of 3

- pixel replication



- connect dots



What about pre-filtering?

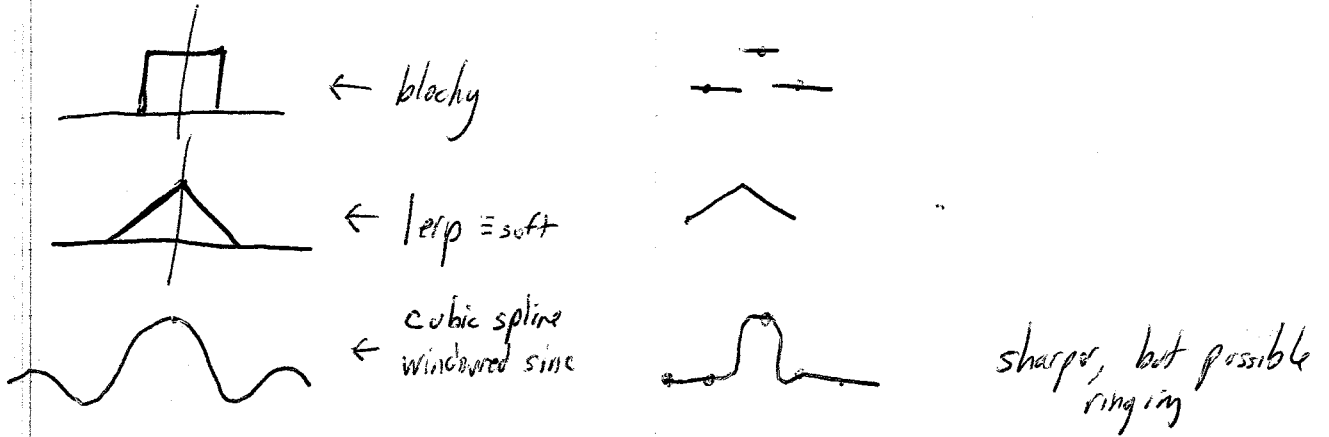
- already band-limited by reconstruction

Interpolating vs. approximating reconstruction

simple @ sample \Rightarrow guess value

(2)

Reconstruction Kernels



2D Convolutions

Seperability

Resampling

image has N samples want M

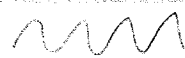
reconstruct (filter) (filter) sample
 ↑
 pre-filter

Do p 23

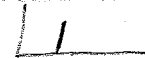
Work through an example

Edge Cases

FOURIER



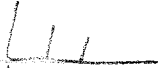
\Rightarrow



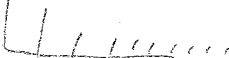
simplification



\Rightarrow



\Rightarrow



Intuitions

HF (square wave)

remove HF = soften hard edges

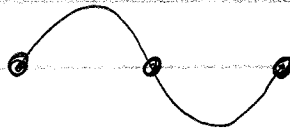
Spike Cham



\Rightarrow



NYQ Shannon



sample at $\frac{1}{2}$ period

- ambiguous

Sample at less than $\frac{1}{2}$ period

- OK

GOTO P12

SHOW %

reconstruct intuitions = practice

pixel replication (box is a bad filter)

pixel