Graphics and Visualization

Holger Kenn

International University Bremen

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Displays

Pixels

Image Reconstruction

Recap

- Course overview
- CG applications
- Things to watch out for (Lens effects in movies...)
- Camera Models (and some terms)

Terms

- Focal point, Focal distance
- Focal depth, Aperture
- `www.uscoles.com/technical.htm`

Cathode Ray Tube

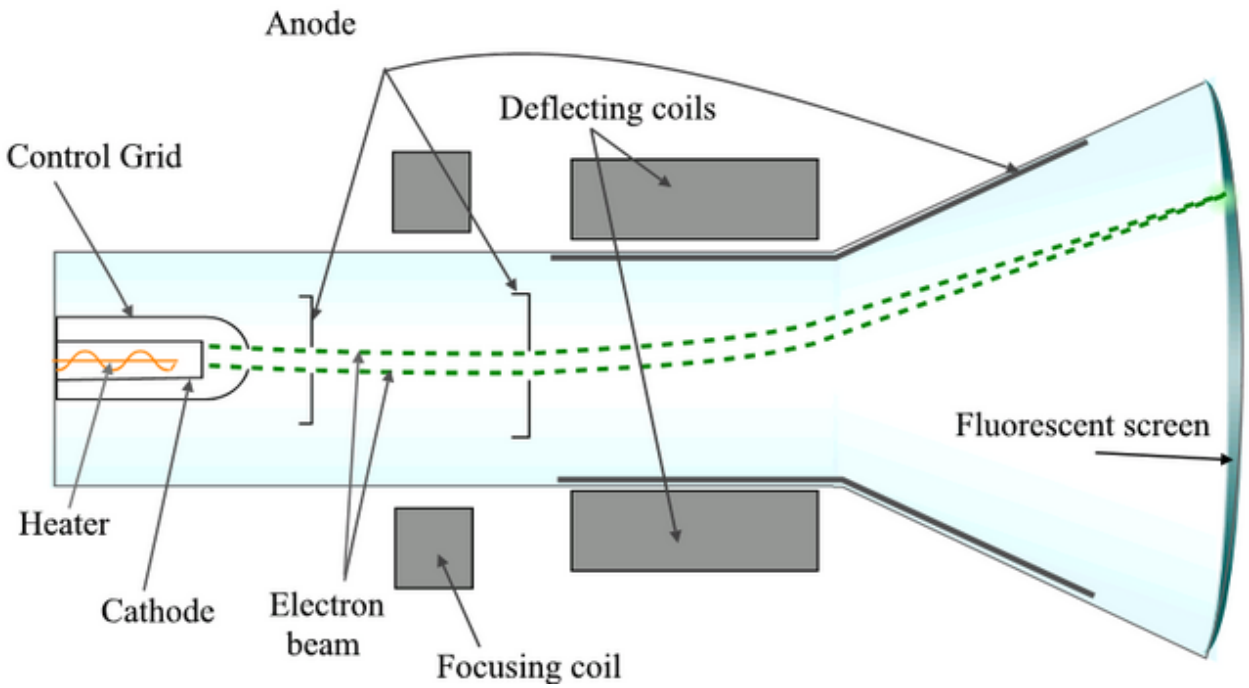


Image from wikipedia

Color CRT

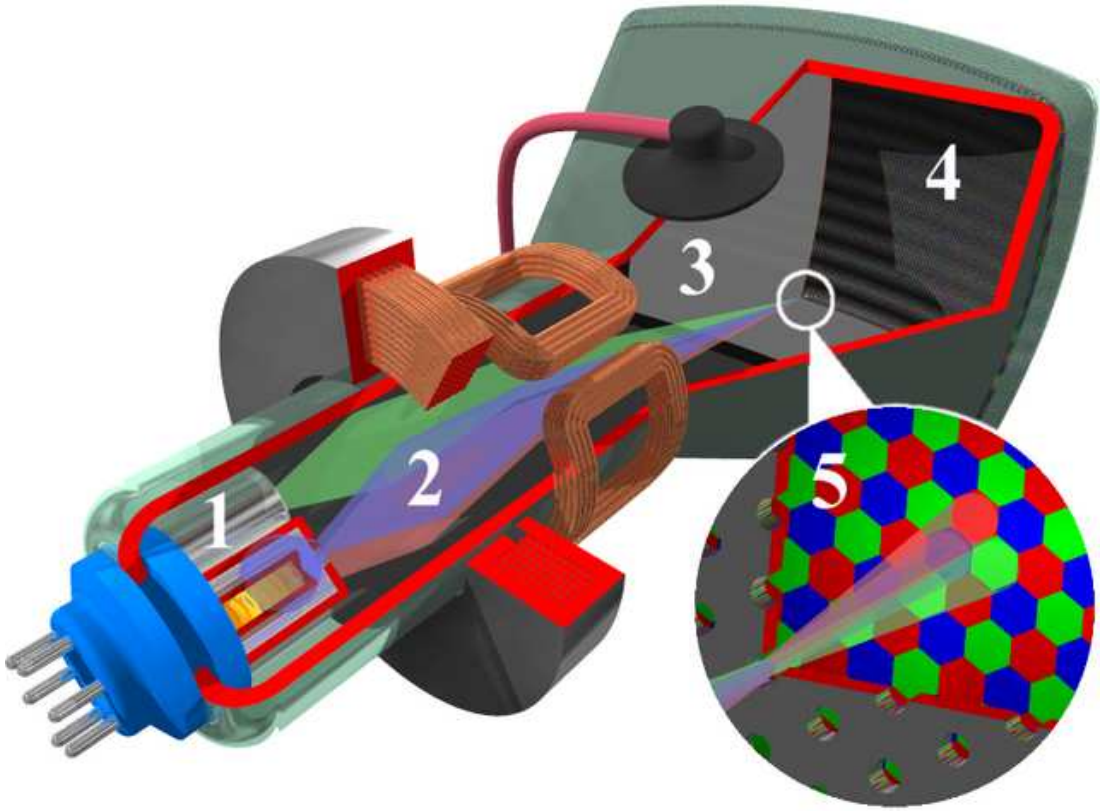


Image from wikipedia

Color CRT dot pitch

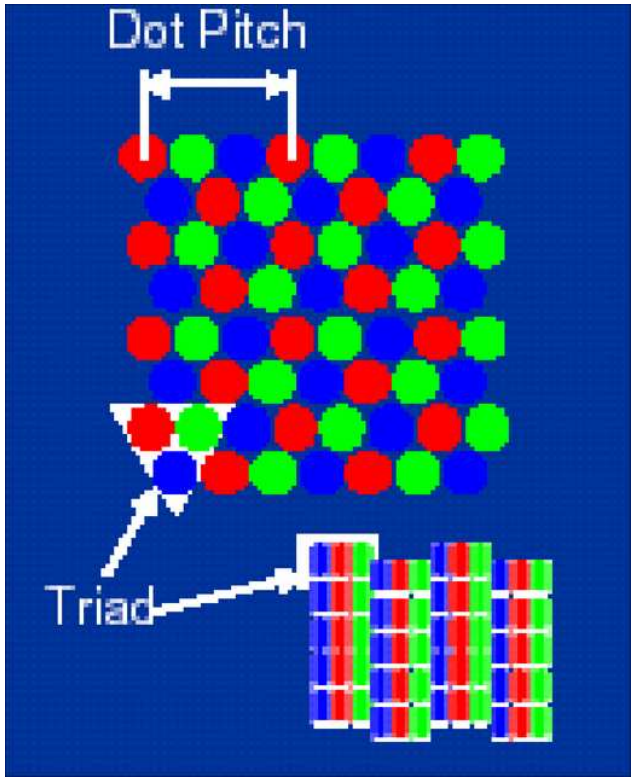


Image from Lawrence McMillan

LCD

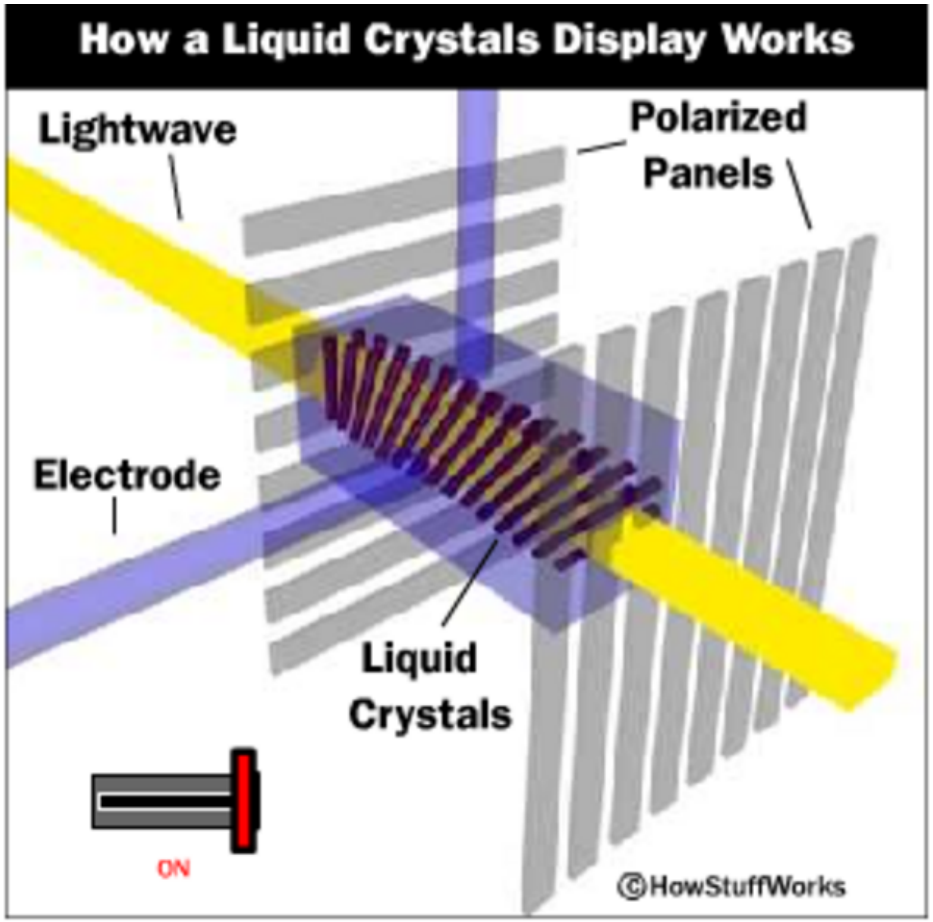


Image from Howstuffworks.com

Typical LCD application

Special LCD application

Image from H. Kenn

Special LCD application

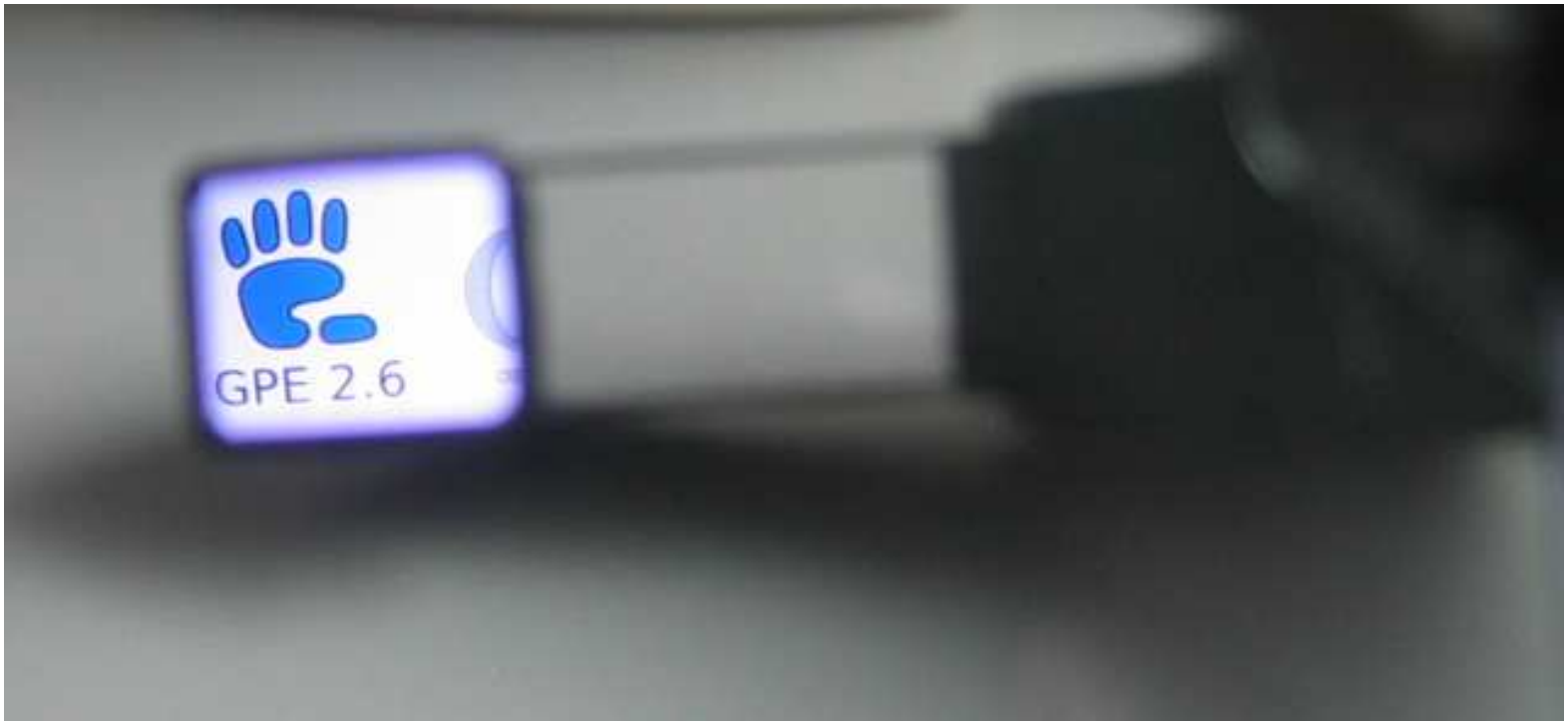


Image from H. Kenn

Light Emmitting Diodes

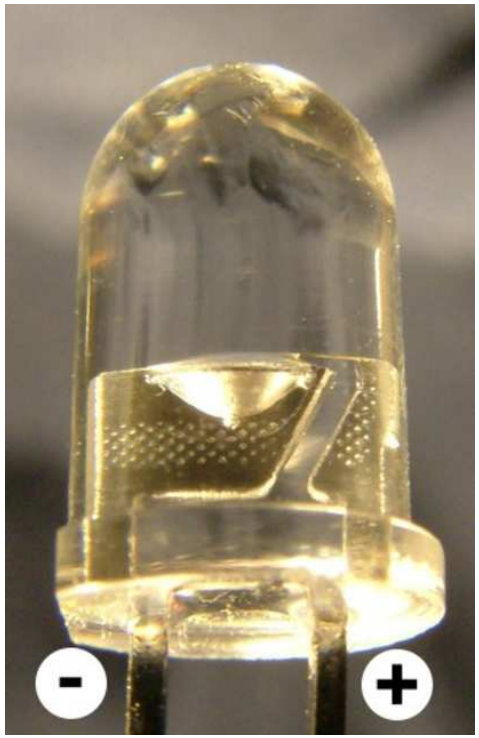


Image from wikipedia

LED application

TROIA Pixelroom

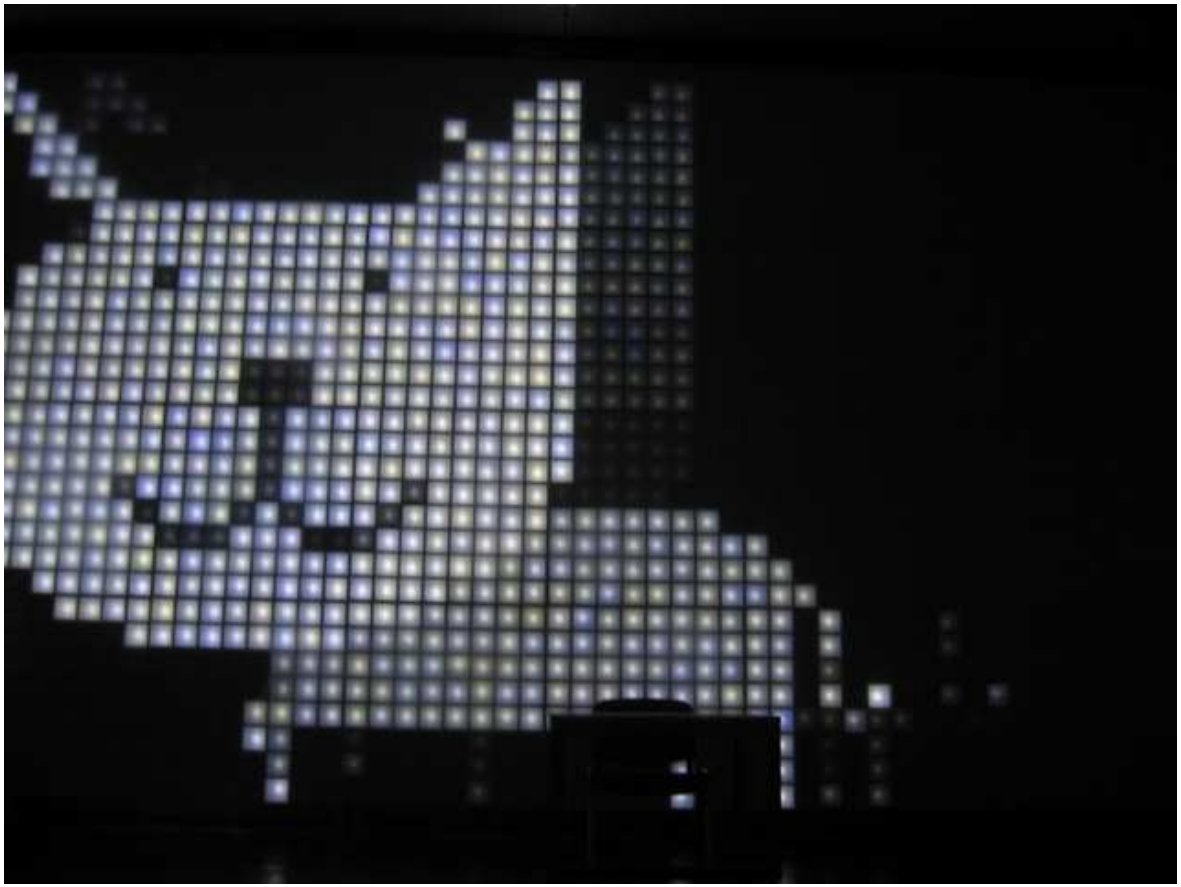


Image from H. Kenn

TROIA Pixelroom

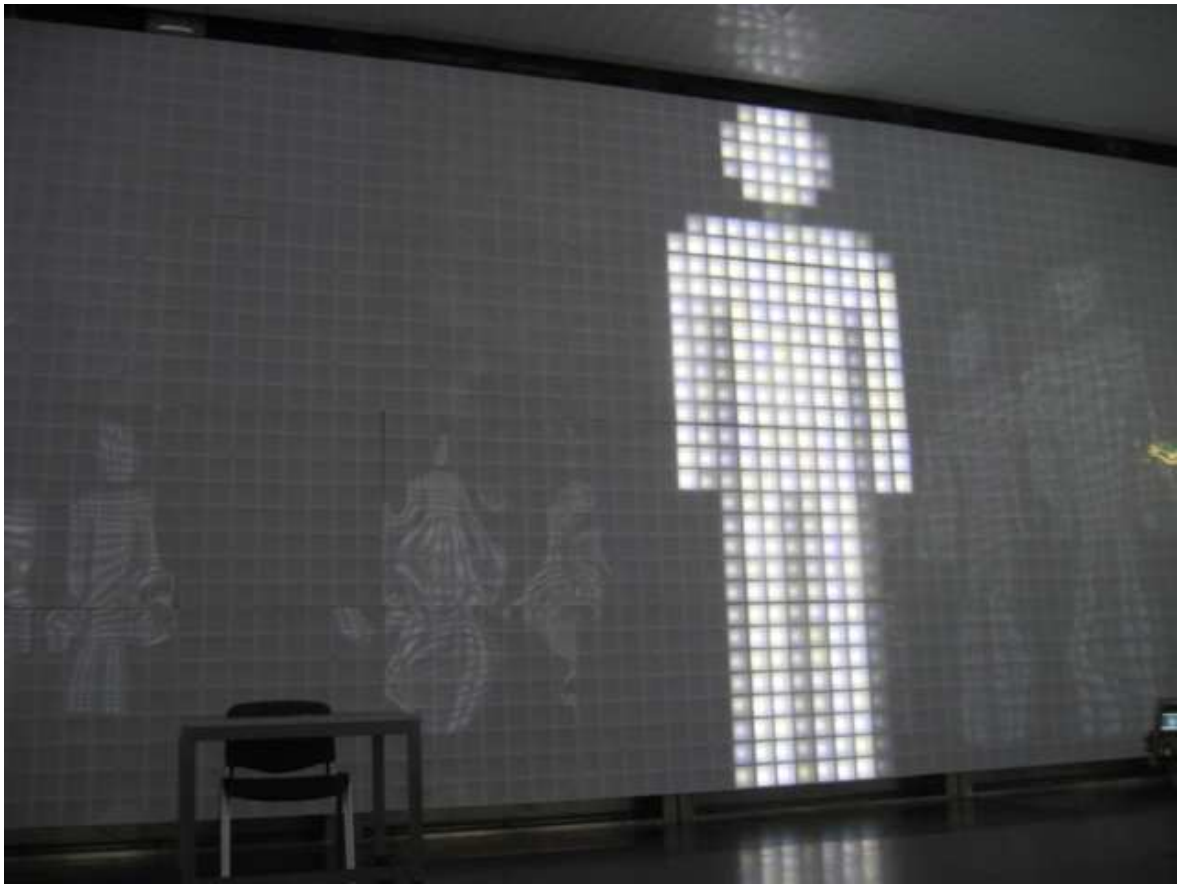


Image from H. Kenn

TROIA Pixelroom

Image from H. Kenn

Plasma Displays

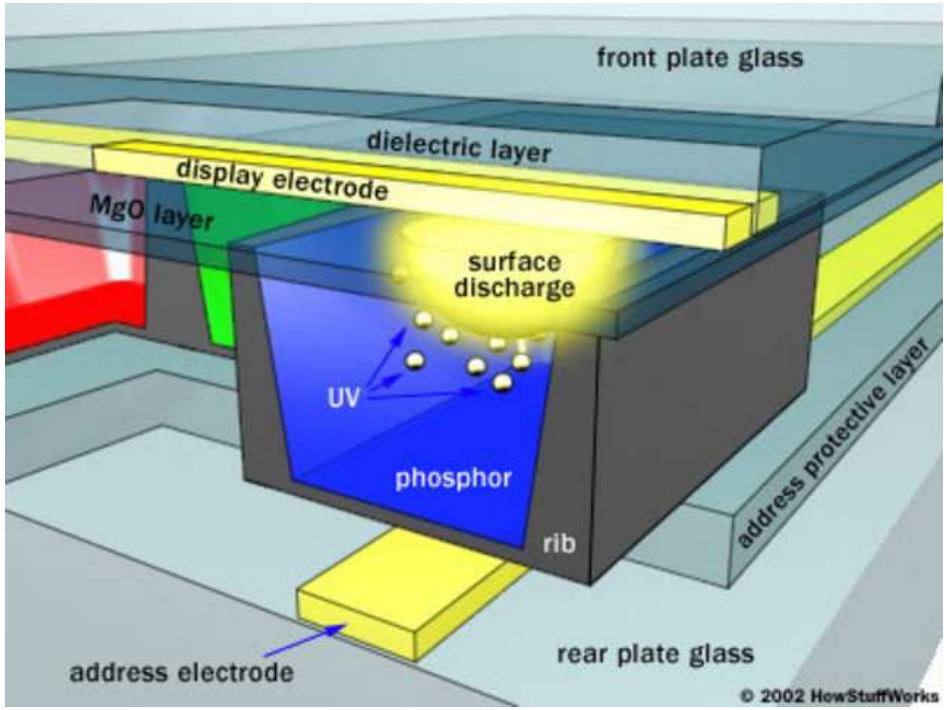
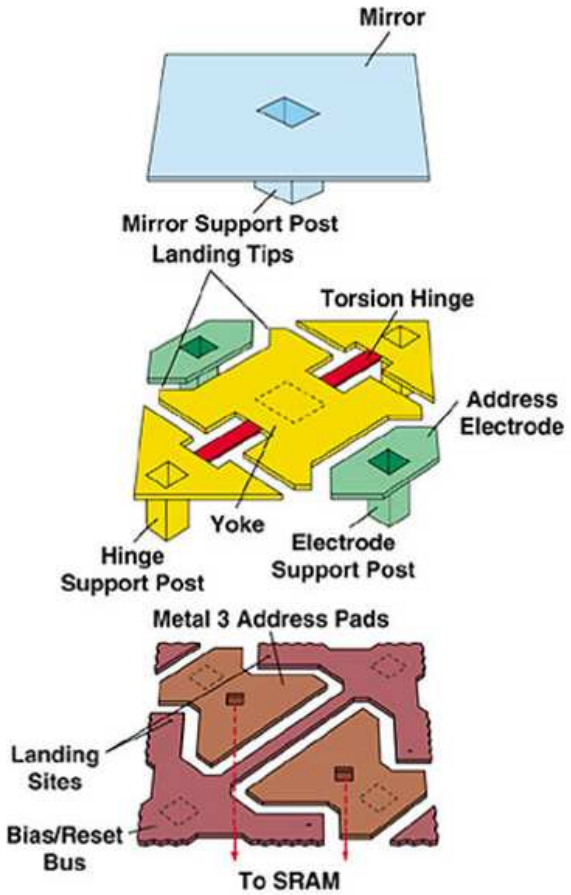


Image from howstuffworks.com

DLP


Mirror
Mirror Support Post
Landing Tips
Torsion Hinge
Address
Electrode
Yoke
Hinge
Support Post
Electrode
Support Post
Metal 3 Address Pads
Landing
Sites
Bias/Reset
Bus
To SRAM

1-Chip DLP

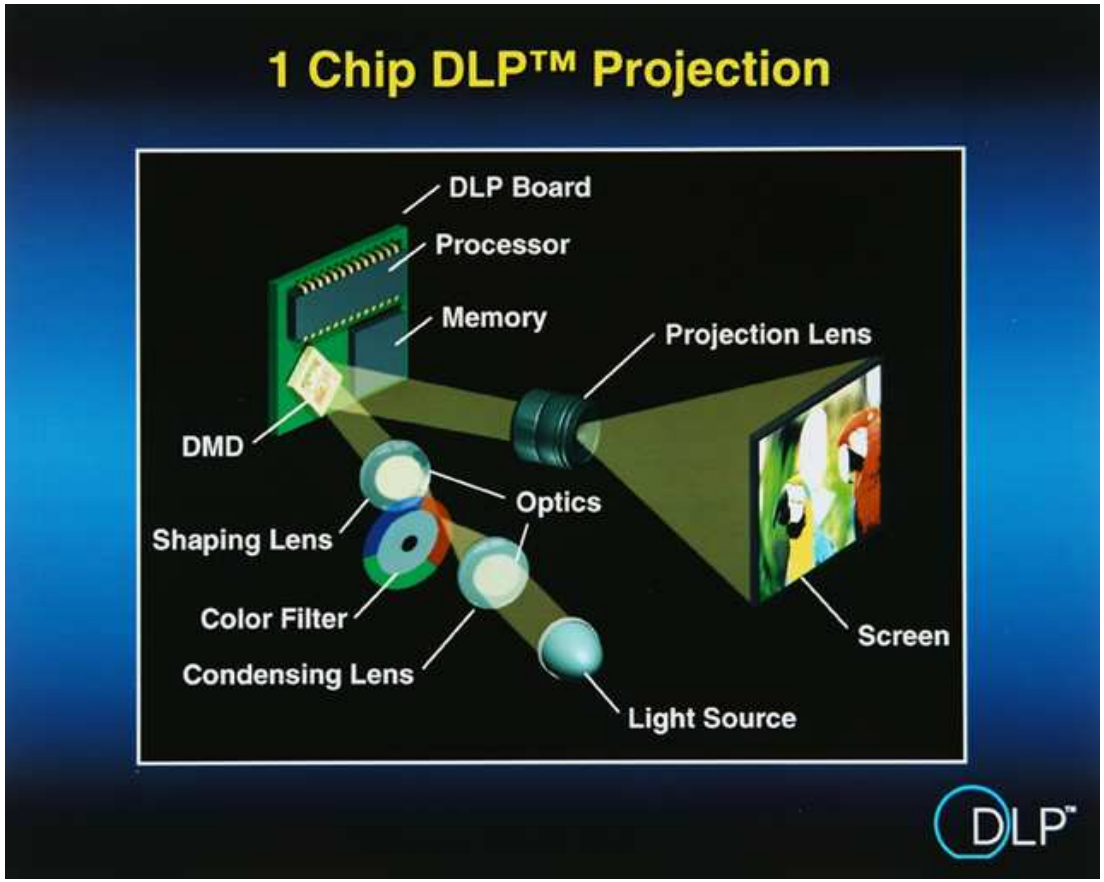


Image from howstuffworks.com

3-Chip DLP

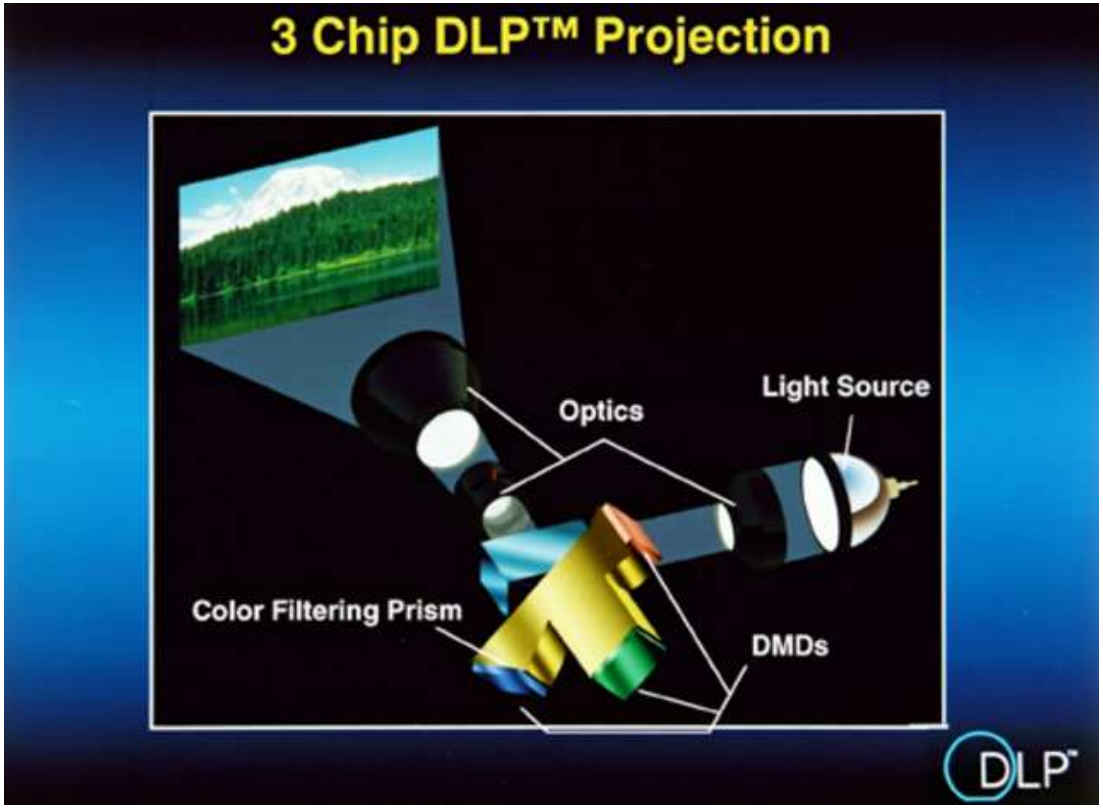


Image from howstuffworks.com

Laser Displays

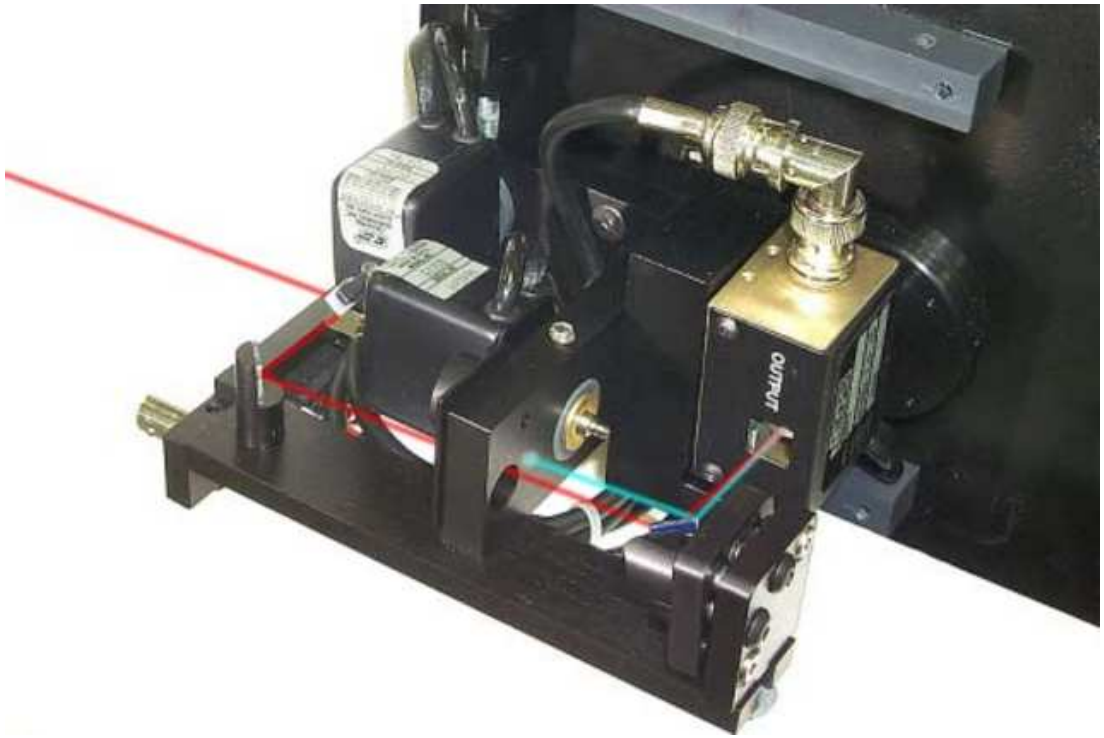


Image from howstuffworks.com

Laser Displays

Image from laserfx.com

Laser Displays

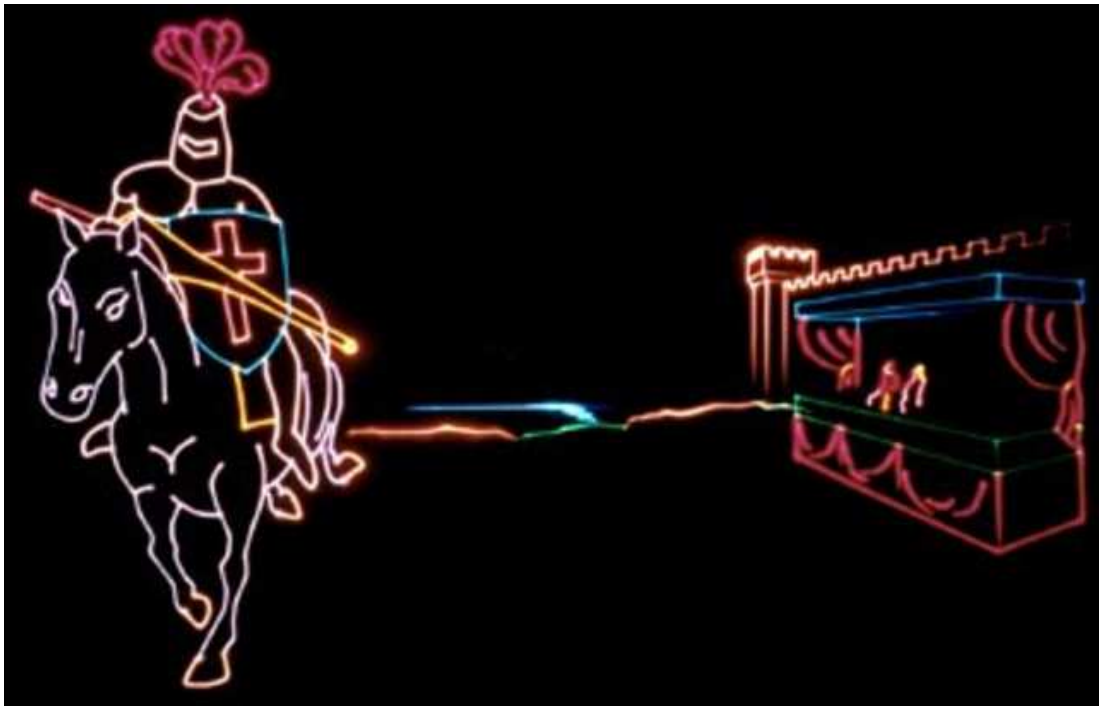


Image from laserfx.com

Laser Displays

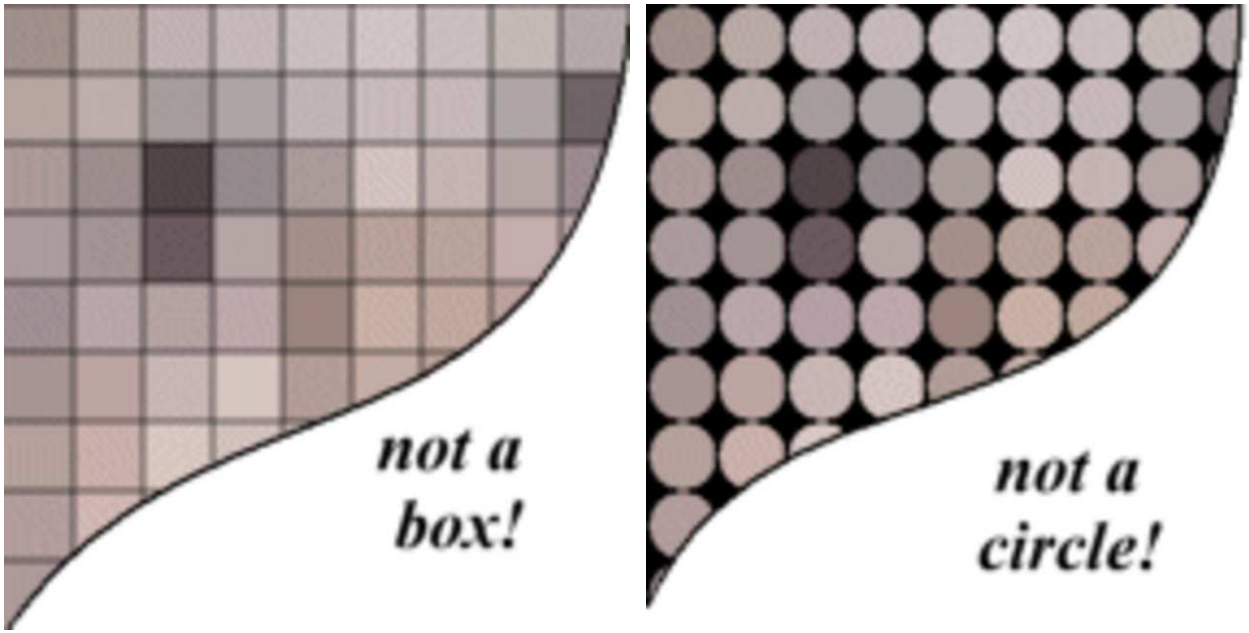
Image from laserfx.com

Display Devices

- Cathode Ray Tubes (CRT): TV, oldfashioned computer monitor
- Liquid Crystal Displays (LCD): Notebooks, portable devices
- Light Emitting Diodes (LED): small devices, pixelkasten
- Plasma Displays: Large TVs
- Projection systems: LCD, DLP
- Vector-based projection: Laser

What is a Pixel?

- Not a little box
- Not a little disk
- Not a little light



What is a Pixel?

- A Pixel is a point sample
- No dimension
- No area
- cannot be seen
- may have a location

What is an Image?

- Ideal continuous 2d function

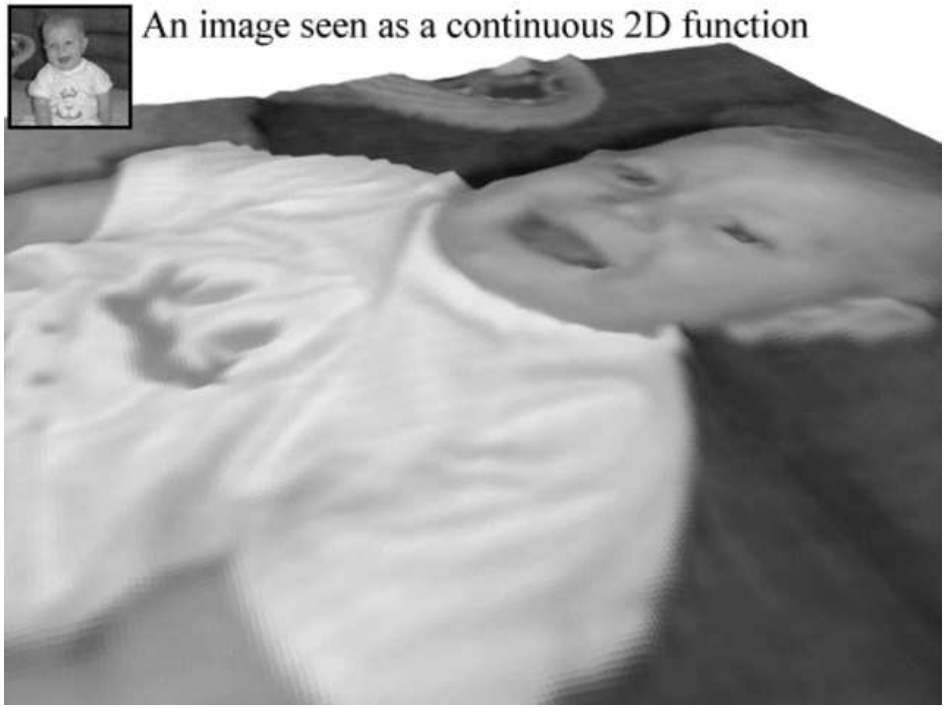


Image Sampling

- Sampling with a grid...

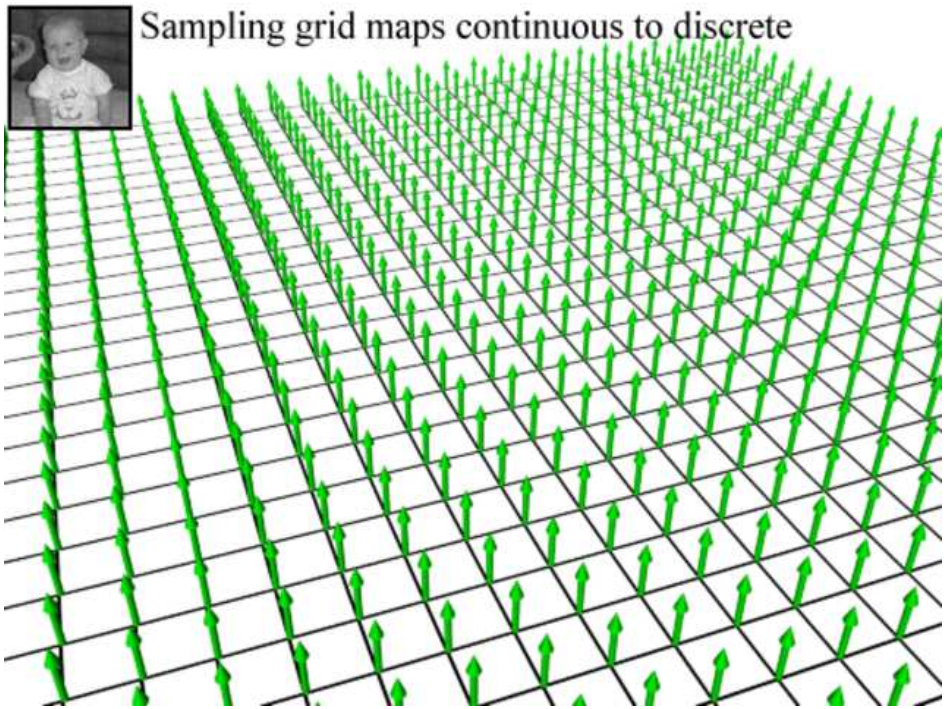


Image Sampling

- Sampled image

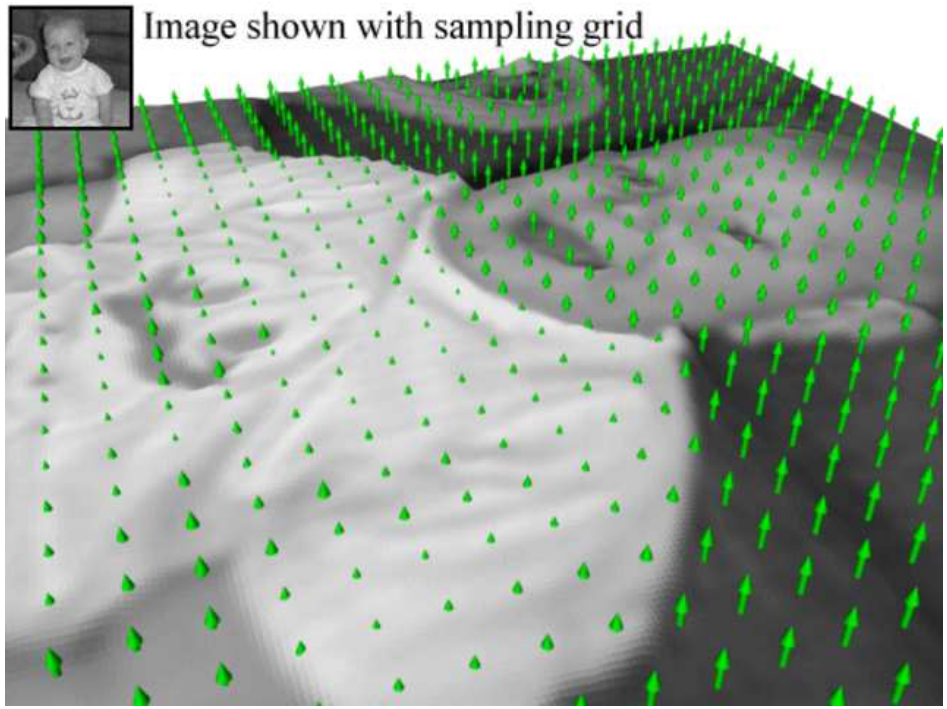
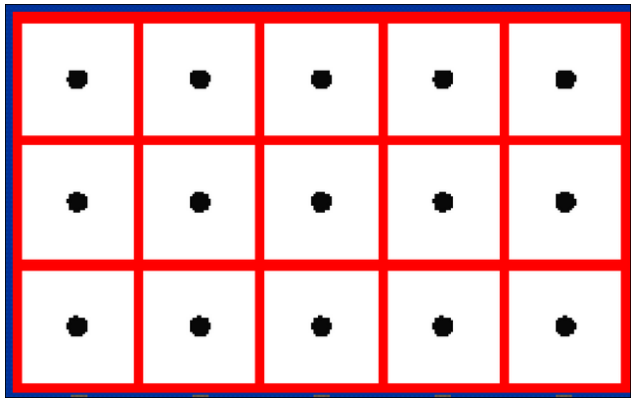


Image Reconstruction

- If pixels are invisible...
- how can we get back the image?

Image Reconstruction Filter

- Box Filter



- Gaussian Filter

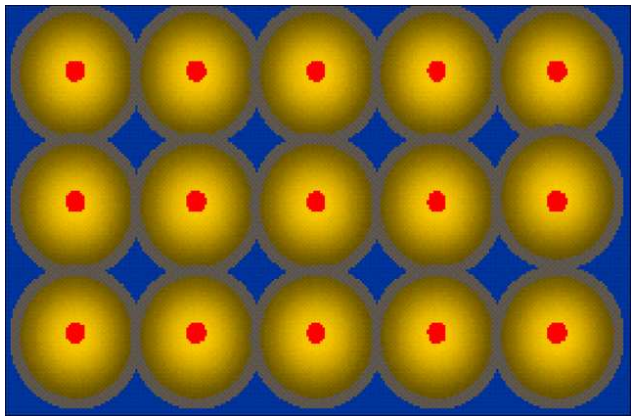


Image Reconstruction Filter

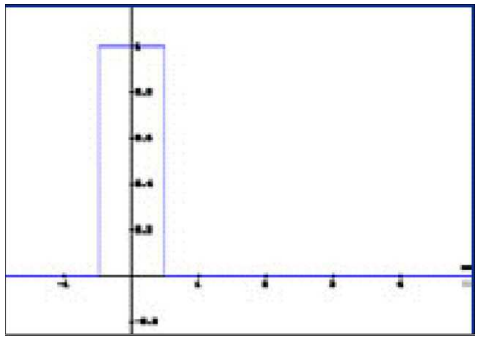
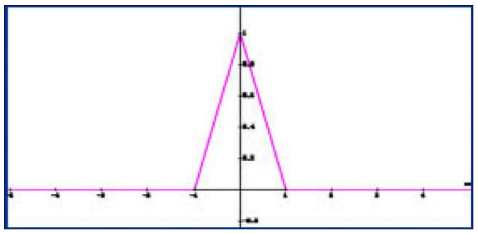
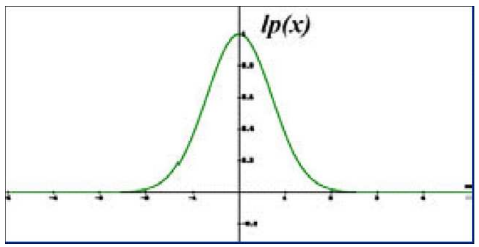
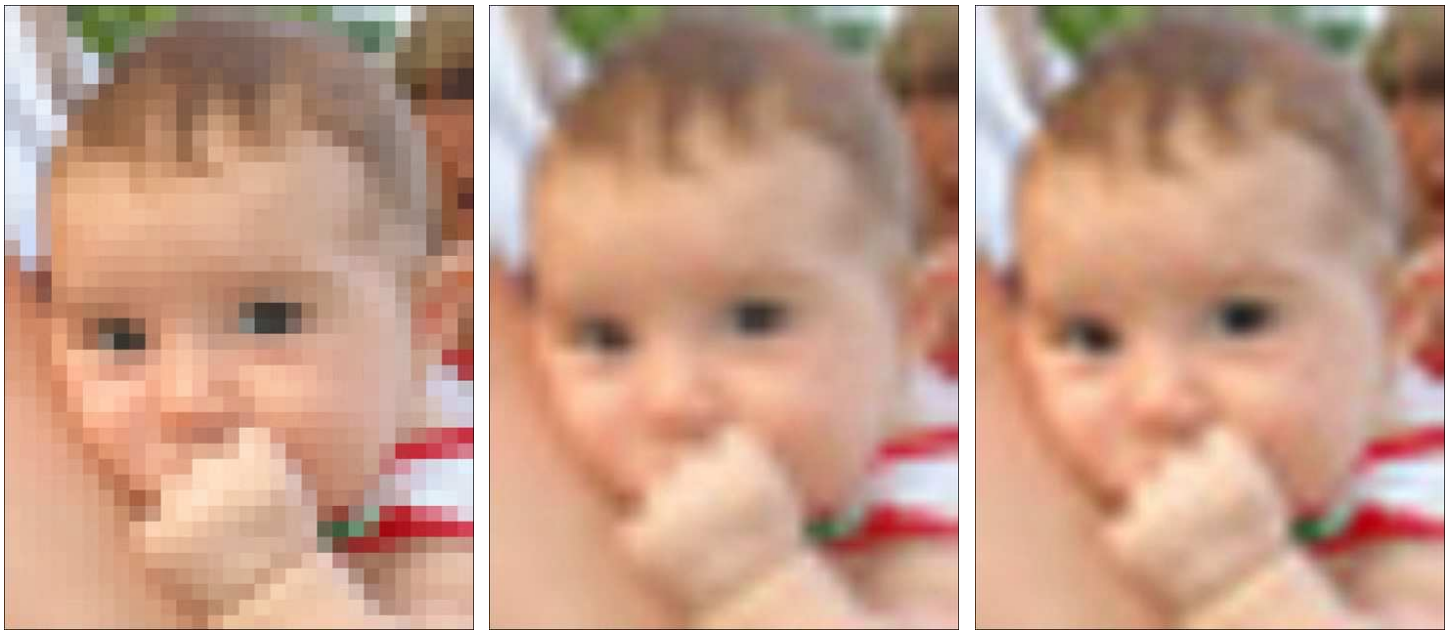
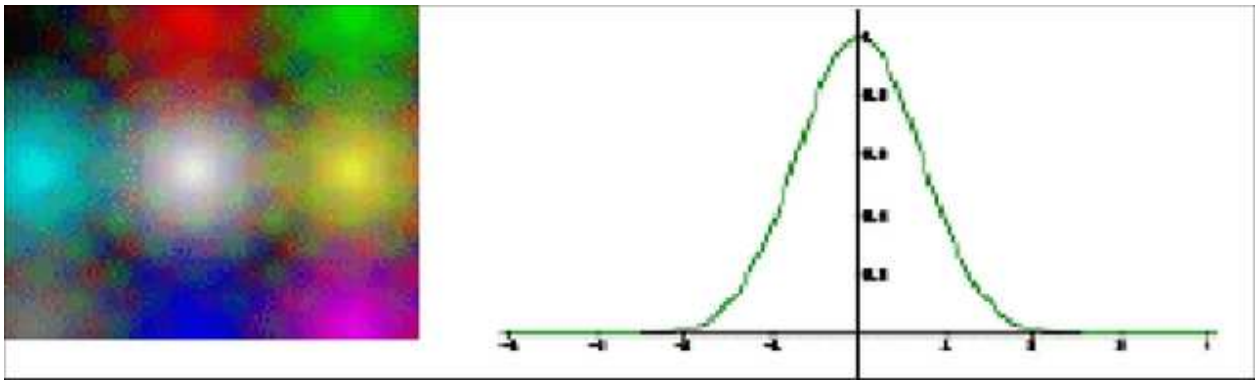
- Box Filter 
- (Bi-)Linear Filter 
- (Bi-)Gaussian Filter 

Image Reconstruction Filter

- Box, Bilinear and Bicubic filters



Monitor reconstruction filter



TROIA Pixelkasten reconstruction filter