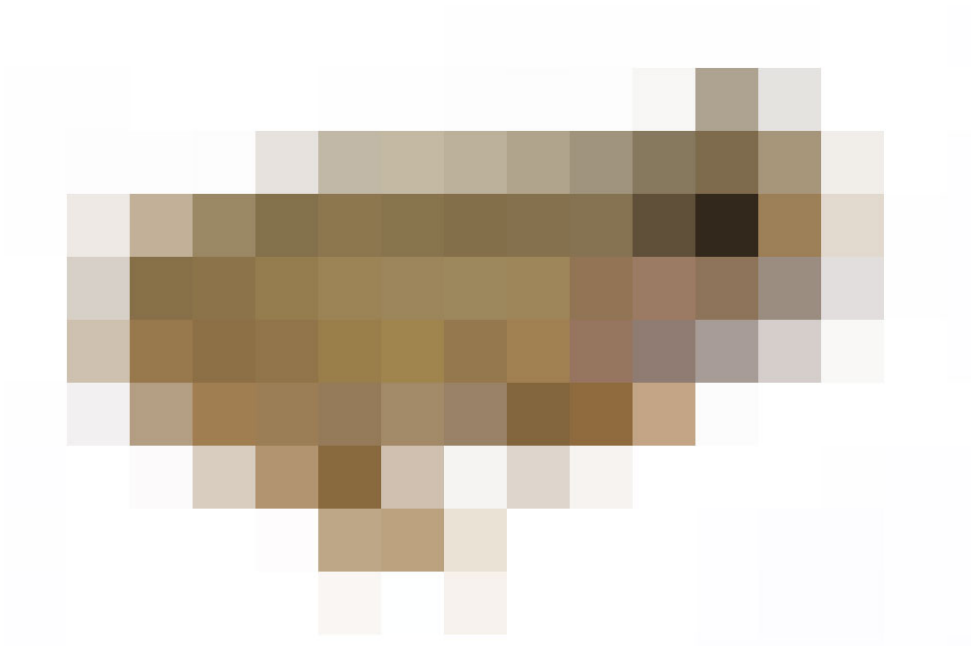
DISSECTING THE FROG

What defines the digital image?



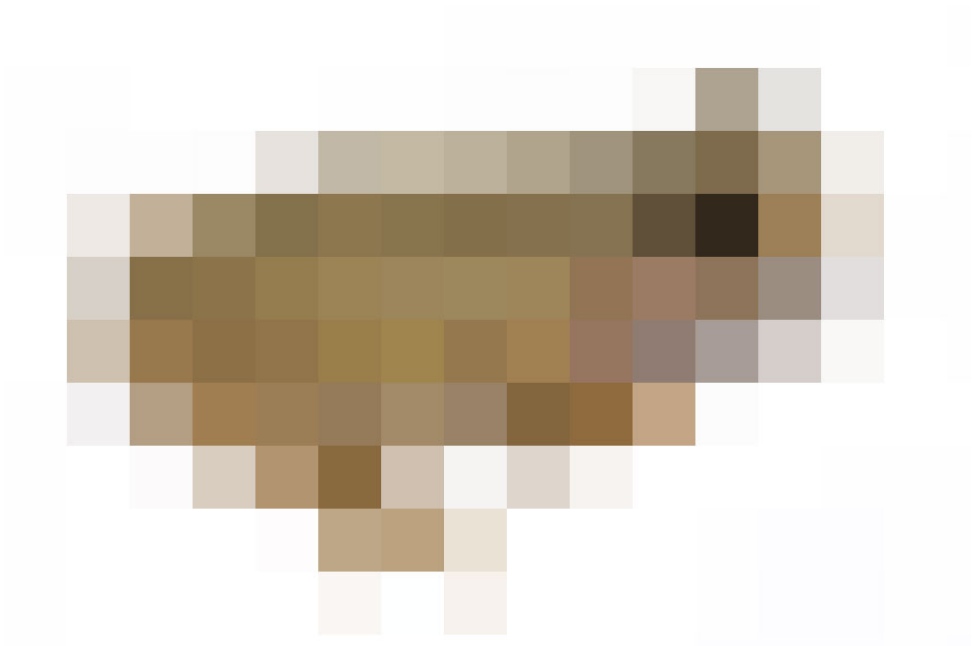
PIXEL

(Picture – element)

The smallest element in a digital image.

As opposed to for instance silver particles in film emulsion.

“There is no picture if there is no grain.”



PIXEL SIZE

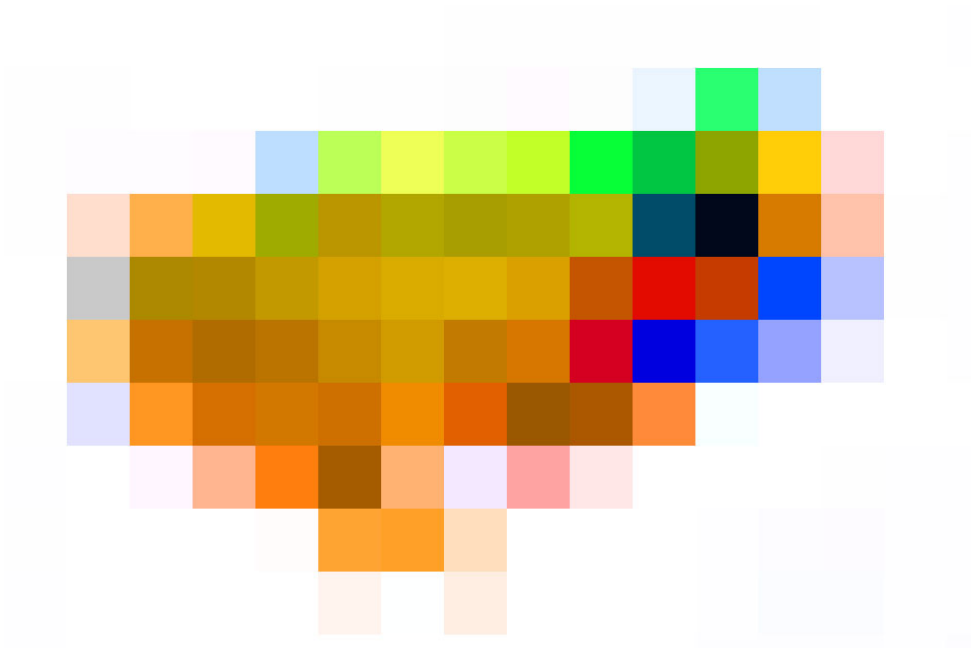
Image resolution describes the detail an image holds.

Photocameras are often described in MP.

Video: PAL, NTSC, HD

Resolution vs. pixel size

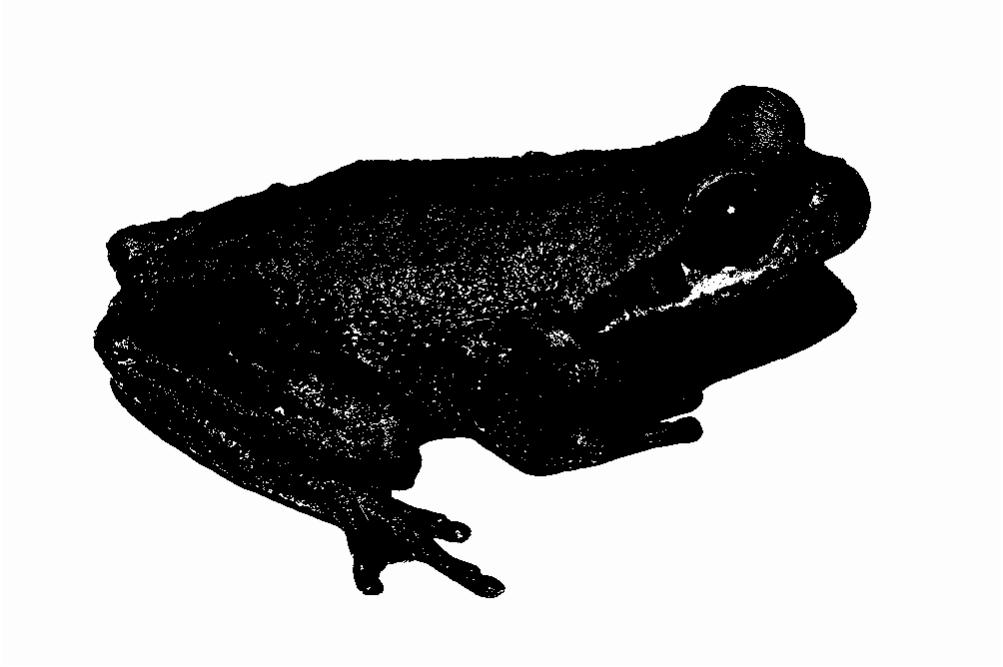
DPI vs. PPI



COLOUR (or color)

Every pixel has a value describing the colour (bits)

COLOUR DEPTH



1-bit per pixel (2 colors)

(bit depth)

The number of bits used to represent the color of a single pixel.

COLOUR DEPTH

(bit depth)

The number of bits used to represent the color of a single pixel.

4-bit per pixel (16 colors)

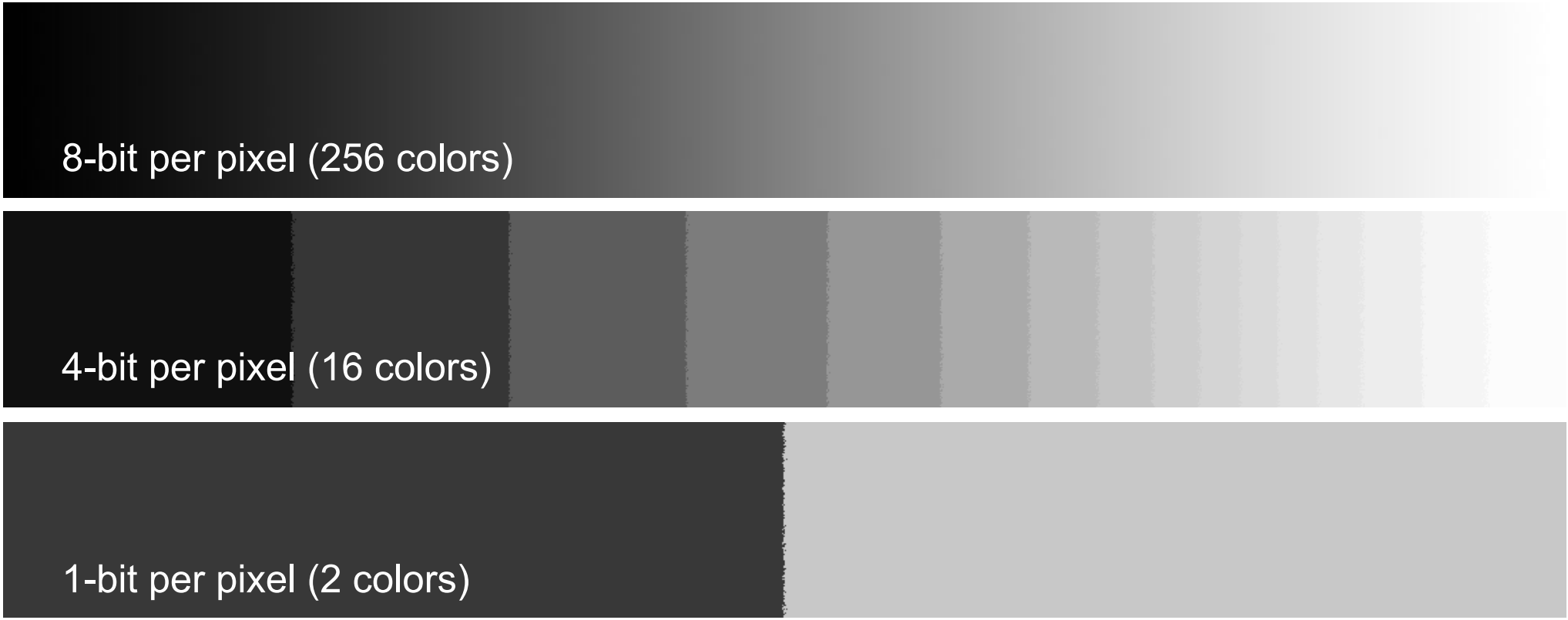
COLOUR DEPTH

(bit depth)

The number of bits used to represent the color of a single pixel.

8-bit per pixel (256 colors)

COLOUR DEPTH



Why do I need to know?

Underexposure

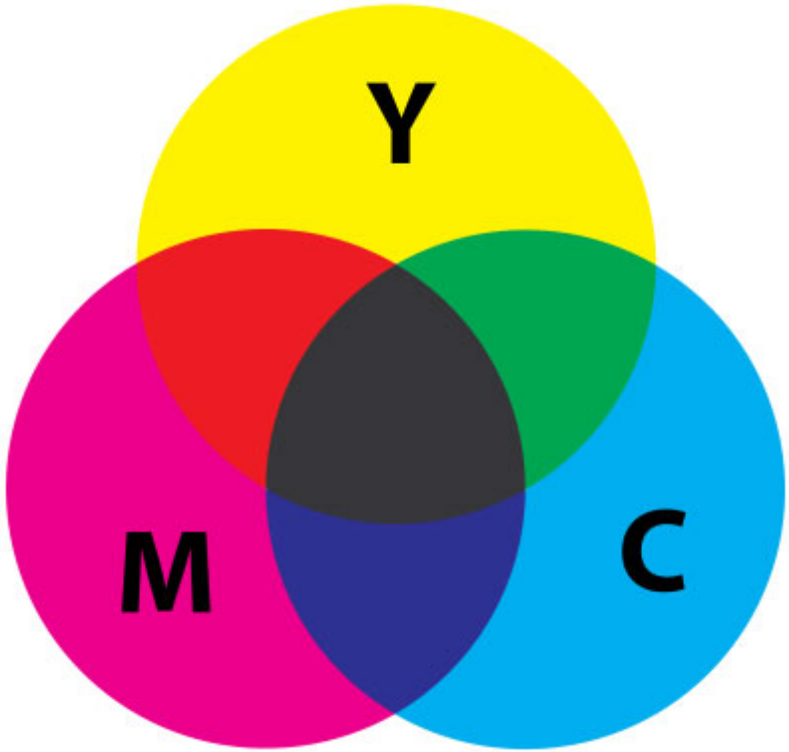
Overexposure

Clipping

Banding

COLOUR

How do we describe colour?



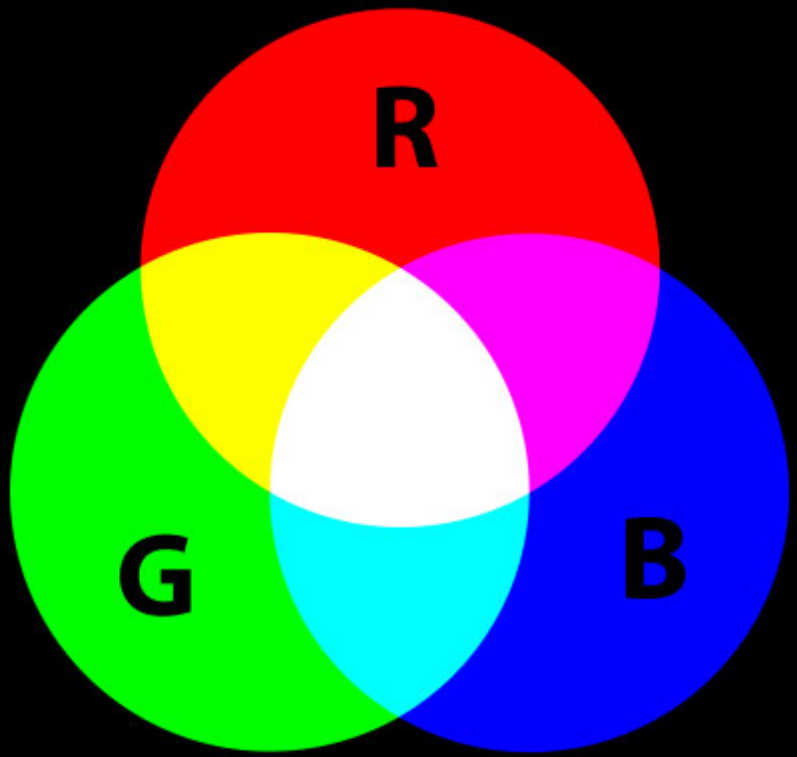
Subtractive colour

The primary colors define the amount of colours possible.

For a long time the only way to mix colours has been using paints, inks and dyes.

We call this subtractive colour mixing.

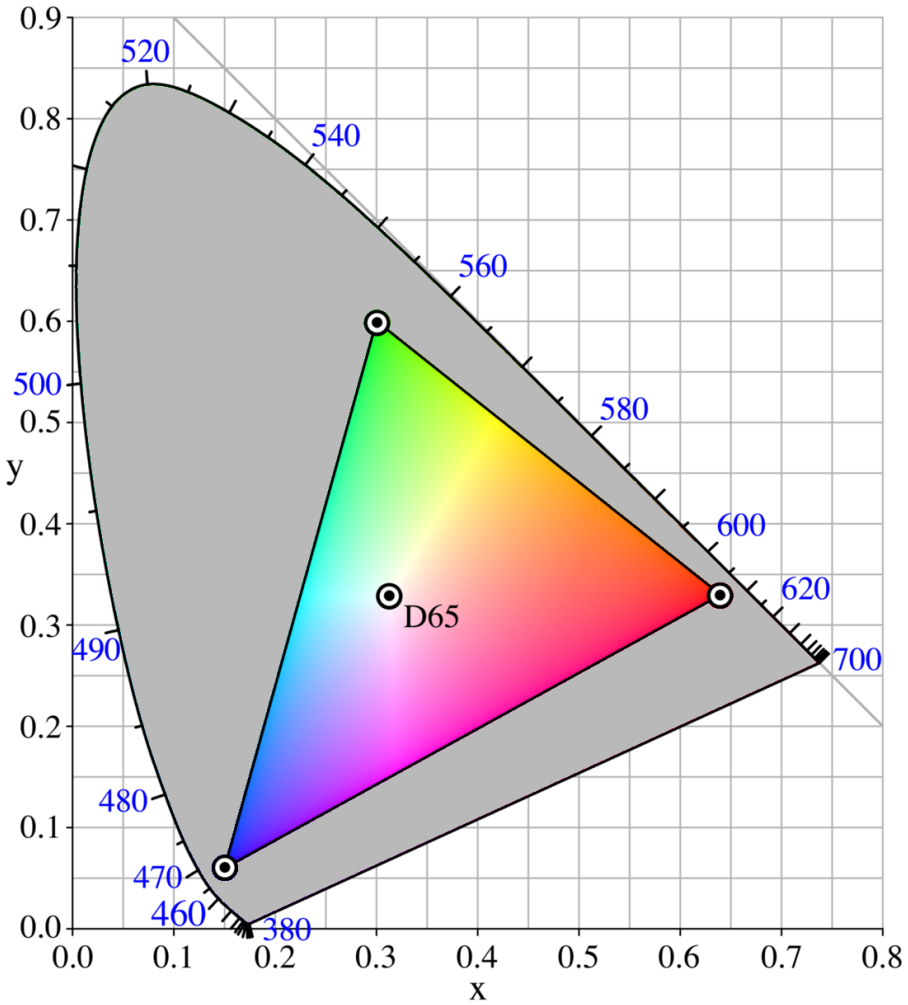
Examples: print, painting, the first colour photography.



Additive colour

The primary colours define the amount of colors possible.

Common colour spaces based on the RGB model are sRGB and Adobe RGB.



CIExy1931 sRGB gamut

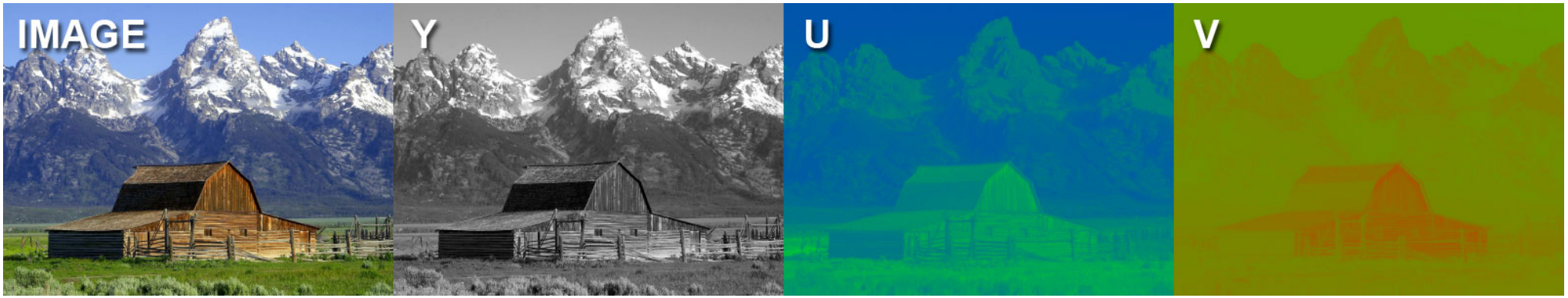
Gamut is the range of colors possible with a given set of primaries.

(Wide gamut means the primaries are chosen to create a large triangle of possible colors).

YUV

YUV was invented to allow for colour TV in a B&W infrastructure.

Most video camera’s (and FCP) still work in this mode.



COLOUR CHANNELS

For digital processing RGB color space is the standard.

The RGB image consists of 3 channels: R, G and B.

RED CHANNEL


GREEN CHANNEL


BLUE CHANNEL

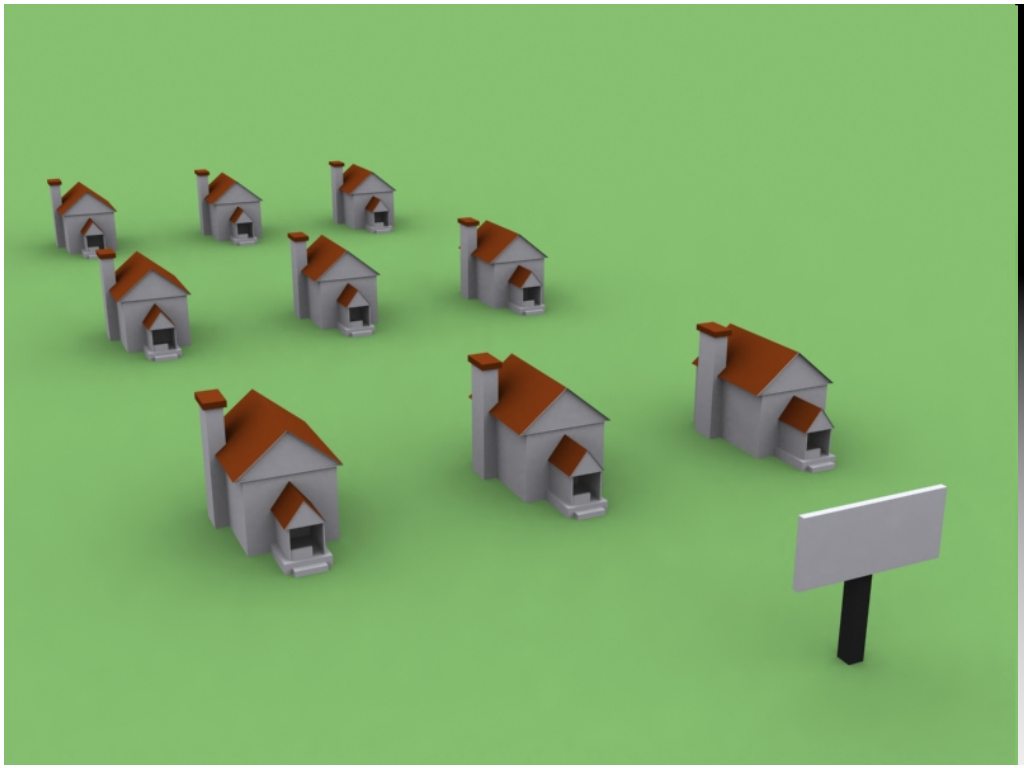
OTHER CHANNELS

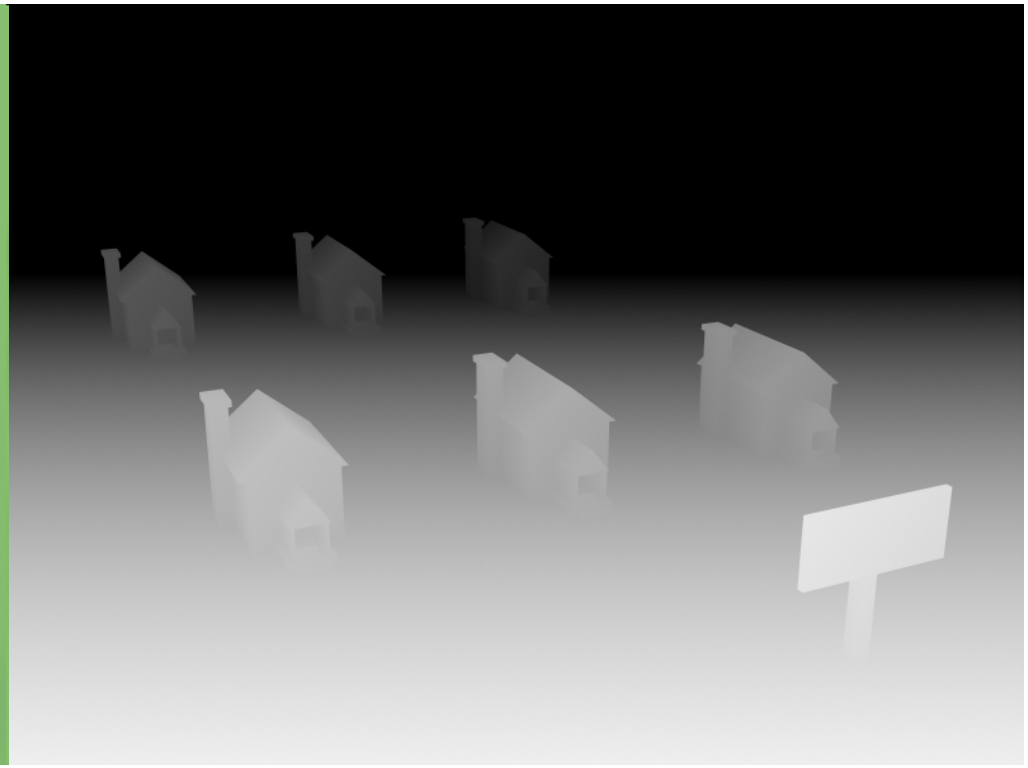
Alpha channel: RGBA images

Usually the alpha channel defines the pixel transparency, represented as a greyscale-value.

OTHER CHANNELS

Channels can be used to hold any kind of information. This is used a lot in images rendered from 3D applications. (z-depth etc).





FURTHER READING…

http://en.wikipedia.org/wiki/Pixel
http://en.wikipedia.org/wiki/Image_resolution
http://en.wikipedia.org/wiki/Color_depth
http://en.wikipedia.org/wiki/Color_space
http://en.wikipedia.org/wiki/RGB_color_model
http://en.wikipedia.org/wiki/YUV
http://en.wikipedia.org/wiki/Colour_banding