Media Types

Data Structures + Methods

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Objects
Media Objects

- **data structure** -
  - represent media type

- **methods** -
  - operations that **capture**
  - operations that **modify**
  - operations that **present**
Media Type template

Media type <name>

Representation

<aspects of representation>

Operations

<categories of operations>
Text - 1

Media type: Text

Representation:
- ASCII
- ISO character sets
- Marked-up text
- Structured text
- Hypertext
Operations

Character operations
String operations
Editing
Formatting
Pattern-matching and searching
Sorting
Compression
Encryption
Language-specific operations
Image - Color model (or color space)

**RGB** -

- A numeric triple specifying red (R), green (G), and blue (B) intensities
- Easily mapped to voltages for the red, green, and blue guns in color CRTs
Image - Color model (or color space)

- **HSB** -
  
  - Colors are represented by a triple representing
    
    - **hue** *(the dominant color)* - represented by an angular value varying from red to green to blue at 120° intervals
    
    - **saturation** *(the intensity of the color)*
    
    - **brightness** *(the amount of gray in a color; brighter colors have less gray)*
**Image - Color model (or color space)**

- **CMYK**
  - subtractive primaries
    - cyan
    - magenta
    - yellow
    - black
  - used in inkjet printer
**Image - Color model (or color space)**

- **YUV**
  
  - used in television industry
  
  - $Y = \text{luminance (black and white portion)}$
  
  - $UV = \text{chrominance (color portion)}$

  
  \[
  Y = 0.3 \times R + 0.59 \times G + 0.11 \times B \\
  U = (B - Y) \times 0.493 \\
  V = (R - Y) \times 0.877
  \]
Image

- **Alpha channel** - used to define regions of full or partial transparency for the creation of masks and blends
- **Number of channels** - the dimensionality of the color model (4 for CMYK, 3 for RGB)
- **Channel depth** - the number of bits per channel
Image

- **Interlacing**
  the order in which the values of a multi-channel image are stored

- **Indexing** -
  color lookup table (CLUT)

- **Pixel aspect ratio** -
  ratio of pixel width to height

- **Compression** -
  lossy vs. lossless
Image - 2

Operations
- Editing
- Point operations
- Filtering
- Compositing
- Geometric transformations
- Conversion
Image - Editing

changing individual pixels

- paintbrush operations
  - airbrushing
  - texturing

- cutting, copying and pasting of groups of pixels
Applying a function to every pixel in an image (or selection).

- **Thresholding** - A pixel is set to 1 or 0 depending on whether it is above or below a threshold value. Used to create masks.

- **Color correction** - An image is modified to increase or decrease
  - color
  - brightness
  - contrast
Image

- **Filtering** - used to blur, sharpen, introduce distortions, and add special effects based on its current value and that of neighboring pixels

- **Compositing** - Combining two or more images to produce a new image

- **Geometric transformations** - displacing, rotating, mirroring, scaling, skewing and warping.

- **Conversions** - from one format to another