Overview of JPEG Compression

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Transform Coding

- **Compression**
  - **Construct sub-images**
  - **Forward transform**
  - **Quantizer**
  - **Symbol encoder**
- **Decompression**
  - **Symbol decoder**
  - **Inverse transform**
  - **Merge sub-images**

JPEG Compression

- 8 x 8 sub-images
- Discrete Cosine Transform
- Huffman & arithmetic coding
- Default Quantization Tables based on Human Perception
- Provision for higher resolution for Luminance compared to Chrominance gives higher compression ratio for color images compared to B&W images

JPEG Compression (Advanced)

- **Progressive transmission mode**
  - **picture gets gradually clearer**
  - **more important frequencies transmitted first**
  - **more than one quantization table can be used**
- **Hierarchical mode**
  - **Transmit bigger size image at next step**
  - **Use lower resolution image to interpolate larger image**
  - **transmit difference between sub-sampled image and interpolated image at each step**

Other Compression Methods

- **Fractals based on repetition of patterns (did not live up to initial hype)**
- **JPEG 2000 --- emerging standard based on Wavelet (Multiresolution) image representation**