**What is Compression?**

Compression basically employs redundancy in the data:

* Temporal -- in 1D data, 1D signals, Audio etc.
* Spatial -- correlation between neighbouring pixels or data items
* Spectral -- correlation between colour or luminescence components. This uses the frequency domain to exploit relationships between frequency of change in data.
* psycho-visual -- exploit perceptual properties of the human visual system.

Compression can be categorised in two broad ways:

**Lossless Compression**

-- where data is compressed and can be reconstituted (uncompressed) without loss of detail or information. These are referred to as bit-preserving or reversible compression systems also.

**Lossy Compression**

-- where the aim is to obtain the best possible ***fidelity*** for a given bit-rate or minimizing the bit-rate to achieve a given fidelity measure. Video and audio compression techniques are most suited to this form of compression.

If an image is compressed it clearly needs to uncompressed (decoded) before it can viewed/listened to. Some processing of data may be possible in encoded form however.

Lossless compression frequently involves some form of ***entropy encoding*** and are based in information theoretic techniques (Fig. [7.1](http://www.cs.cf.ac.uk/Dave/Multimedia/node202.html#fig:coding))

Lossy compression use source encoding techniques that may involve transform encoding, differential encoding or vector quantisation (Fig. [7.1](http://www.cs.cf.ac.uk/Dave/Multimedia/node202.html#fig:coding)).

