



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with ‘A’ Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**COURSE NAME : 19EC513 – IMAGE PROCESSING AND COMPUTER
VISION**

III YEAR / V SEMESTER

Unit III- IMAGE COMPRESSION AND IMAGE SEGMENTATION

Topic : Lossy compression – Transform coding

Lossy compression – Transform coding / 19EC513/ IMAGE PROCESSING AND COMPUTER VISION
/Mr.S.HARIBABU/ECE/SNSCE



Lossy Compression



What are the two types of data compression?

There are two methods of compression – lossy and lossless.

- Lossy reduces file size by permanently removing some of the original data.
- Lossless reduces file size by removing unnecessary metadata.

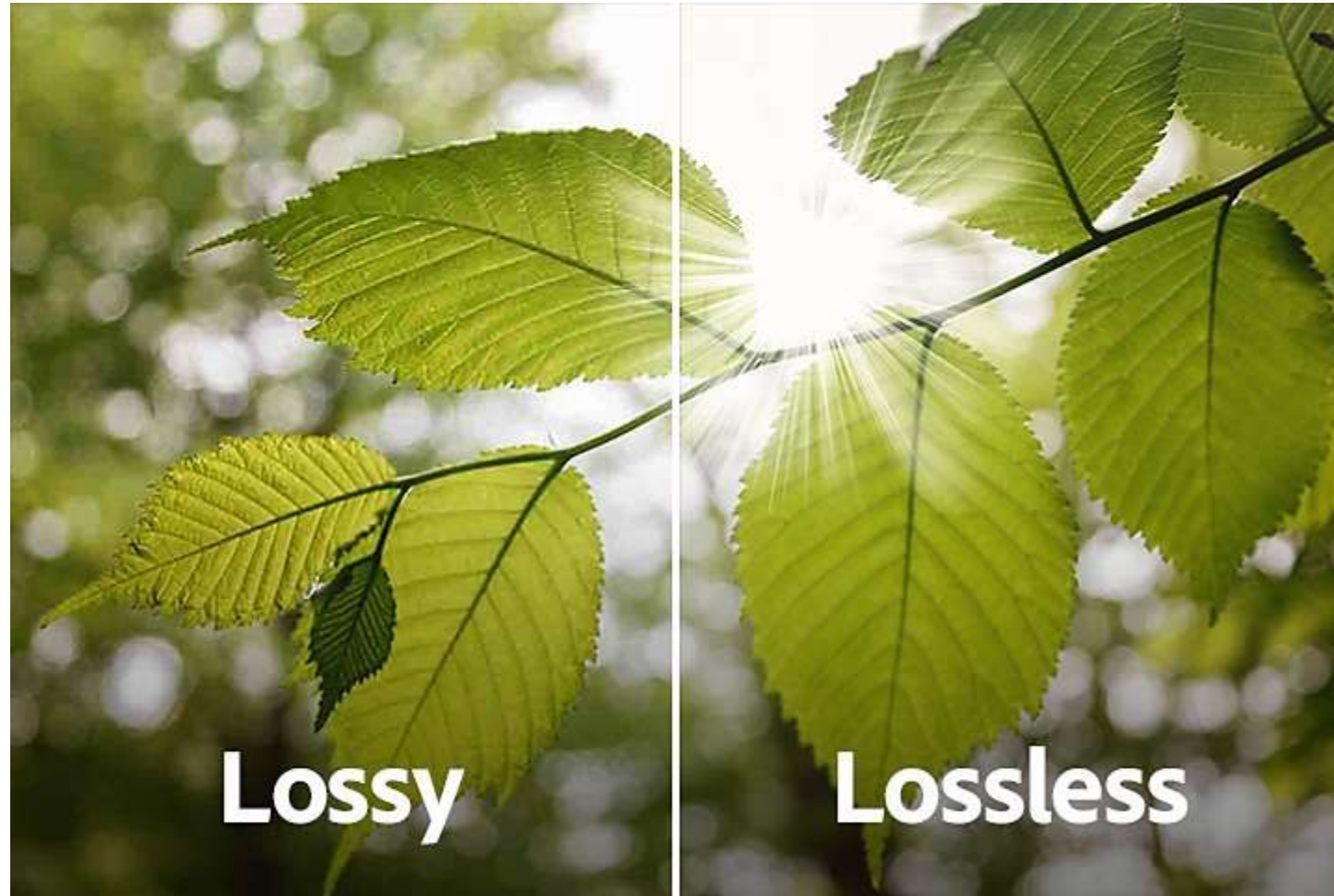
Lossy algorithms.

[Lossy compression](#) is typically used when a file can afford to lose some data, and/or if storage space needs to be drastically ‘freed up’.

Here, an algorithm scans image files and reduces their size by discarding information considered less important or undetectable to the human eye.

Using lossy methods therefore requires you to make a balanced judgement between:

- storage/delivery requirements
- loading times (e.g. on the web)
- image quality

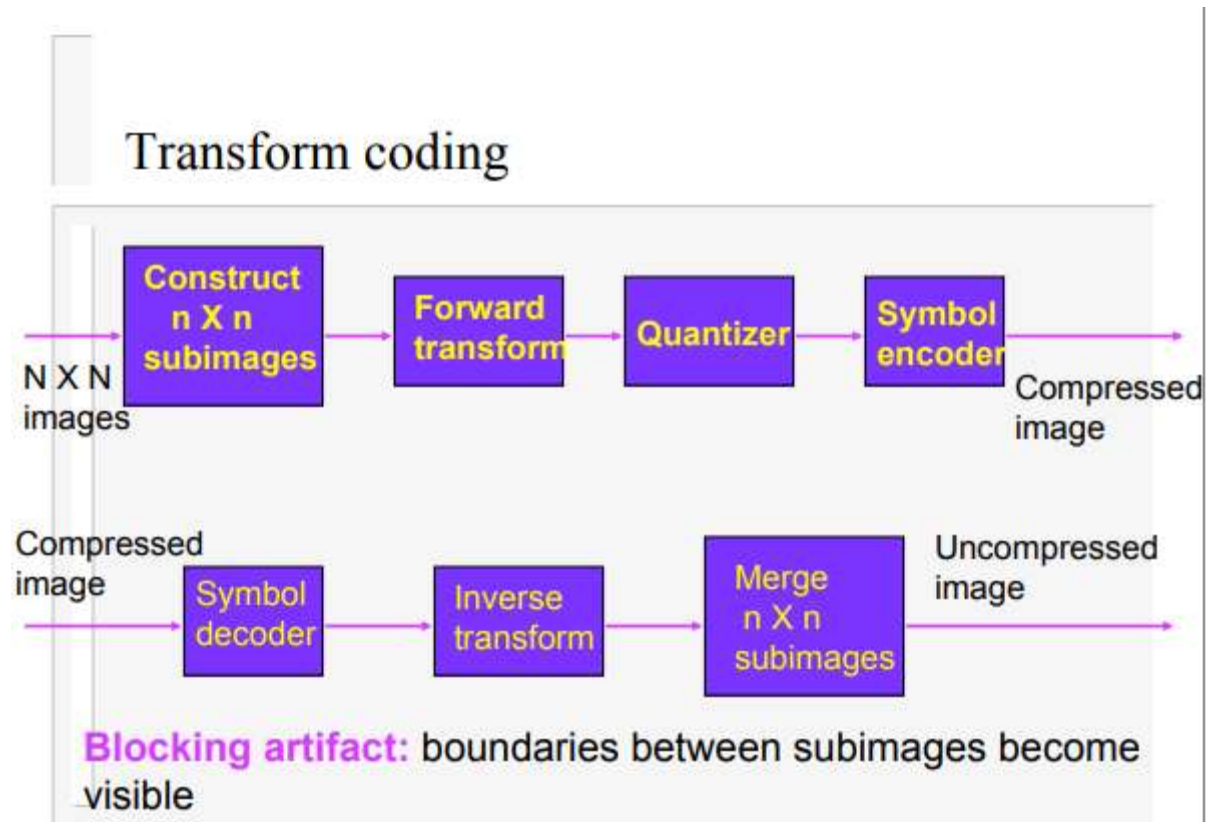




When to use Lossy Compression



- **Updating your website – lossy** is the best option here, as the significant reduction in file size will create faster load times
- **you're running out of hard drive space** – if you need to free up lots of space, and that's more important than the quality of the pictures, consider **lossy**.
- **You save your pics to a cloud service and are running out of space** – if you can afford to lose image quality, you could use **lossy**
- **Sharing a selection of event photographs** – if this is a large number of smaller or thumbnail pictures, use **lossy**
- **You have lots of images to go on your site that can be displayed in a small size** – ensure your site loads quickly with **lossy**.



Transform Selection

- DFT
- Discrete Cosine Transform (DCT)
- Wavelet transform
- Karhunen-Loeve Transform (KLT)
-

$$T(u, v) = \sum_{x=0}^{n-1} \sum_{y=0}^{n-1} g(x, y) r(x, y, u, v) \text{ --- (8.2.10)}$$

$$g(x, y) = \sum_{u=0}^{N-1} \sum_{v=0}^{N-1} T(u, v) s(x, y, u, v) \text{ --- 8.2.11}$$

Transform Kernels

- Separable if $r(x, y, u, v) = r_1(x, u) r_2(y, v) \text{ --- (8.2.12)}$
- E.g. DFT: $r(x, y, u, v) = \exp(-j2\pi(ux + vy) / n)$
- E.g. Walsh-Hadamard transform (see page 568, text)
- E.g. DCT

Approximations using DFT, Hadamard and DCT, and the scaled error images





THANK YOU !!!