



# **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 I- DIGITAL IMAGE FUNDAMENTALS AND  
TRANSFORMS**

**Topic : Wavelet transform**



## Introduction

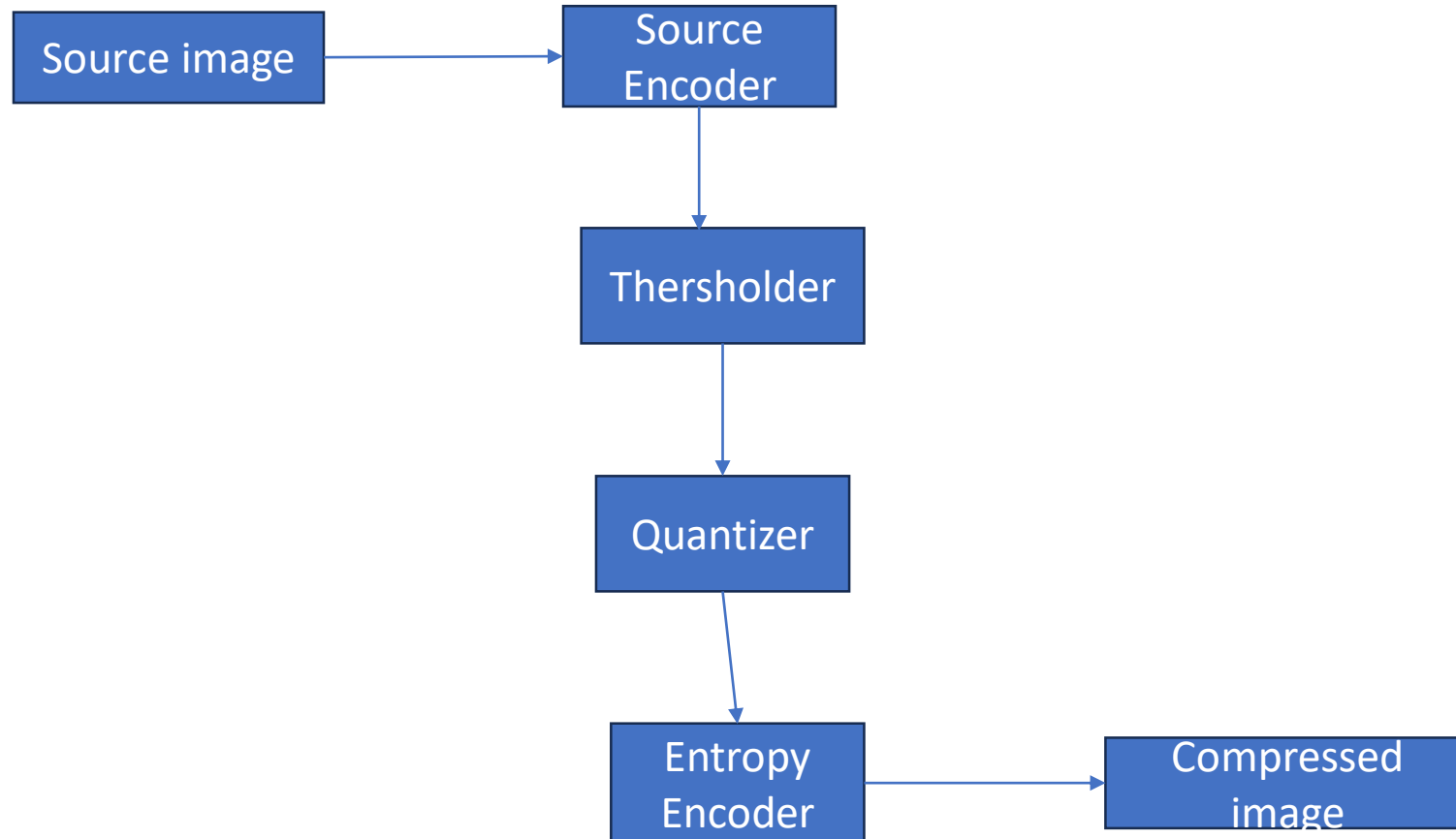
- Wavelets are mathematical functions that splits up data into different frequency components and then study each component with a resolution matched to its scale.
- Wavelet transform decomposes a signal into a set of basis functions. These basis functions are called as wavelets

## Why wavelets ?

- Good approximation properties
- Efficient way to compress the smooth data except in localized region
- Easy to control wavelets properties.
- (Example : Smoothness, better accuracy near sharp gradients)



## Methods / steps





- Digitize the source image to a signal  $s$ , which is a string of numbers.
- Decompose the signal into a sequence of wavelets coefficients.
- Use the thresholding to modify the wavelet compression from  $w$  to another sequence  $w'$
- Use quantization to convert  $w'$  to a sequence  $q$ .
- Apply entropy coding to compress  $q$  into a sequence  $e$ .

## STEP 1

A	B	C	D



A+B	C+D	A-B	C-D
L		H	

## STEP 2

A		C	
B		D	
L		H	



A+B		C+D	
		LL	
A-B		C-D	
		LH	

*LEVEL 1*

LL1	HL1
LH1	HH1

*LEVEL 2*

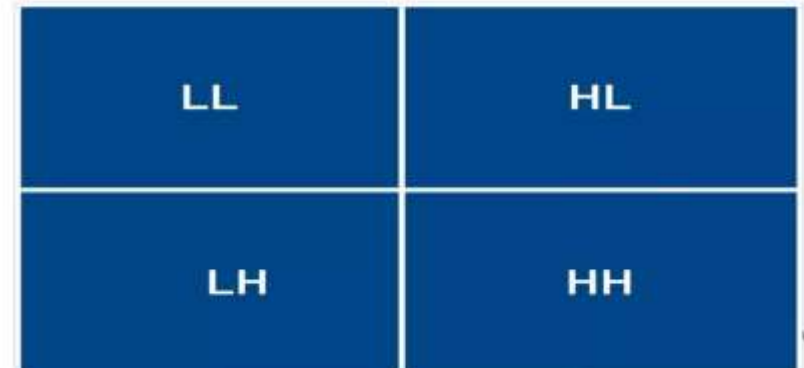
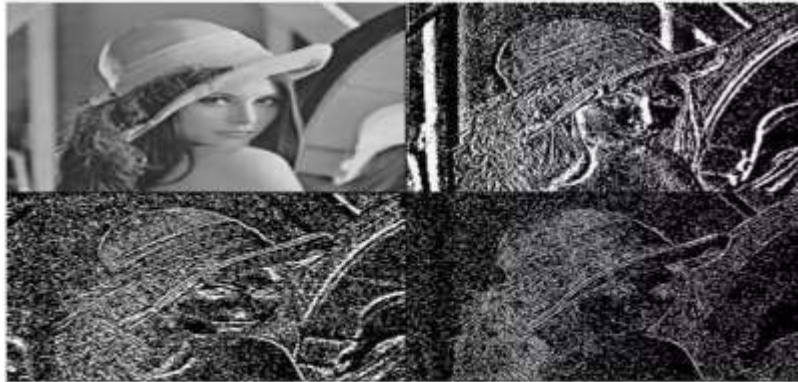
LL2	HL2	HL1
LH2	HH2	
LH1		HH1

LL3	HL3	HL2	HL1
LH3	HH3		
LH2		HH2	HH1
LH1			

*LEVEL 3*



# APPLICATION





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Any Query????

Thank you.....





Any Query????

Thank you.....