CODAREA INTERCADRE.

$$e(m,n,i) = u(m,n,i) - \hat{u}(m,n,i-1)$$

- $e(m,n,i)$ – semnalul de intercadre
- $u(m,n,i)$ – (cadrul curent) pixelul de coord (m,n) din cadrul i
- $\hat{u}(m,n,i-1)$ – (cadrul referință) val reprodusă a pixelului de coord (m,n) din cadrul $i-1$

$|e(m,n,i)| > \eta \rightarrow$ este cuantizată și codată pentru transmisie

La recepție

$$\hat{u}(m,n,i) = \begin{cases} \hat{u}(m,n,i-1) + \hat{e}(m,n,i) \\ \quad \text{dacă } |e(m,n,i)| > \eta \\ \hat{u}(m,n,i-1), \text{ în rest} \end{cases}$$

PROBLEMA

8×8

$\eta = 11$

a) $E[8 \times 8]$

b) Blocul 8×8 reconstituit la decodor

MSE

Cadrul referință =

120	128	120	140	160	200	210	19
120	120	130	164	164	200	200	18
120	100	80	80	80	90	120	164
100	70	60	64	64	60	60	100
70	60	32	32	32	32	60	70
100	80	80	70	70	100	132	132
100	90	90	100	100	100	100	13
100	100	90	80	80	90	100	13

Cadrul curent = $\begin{bmatrix} 114 & 120 & 120 & 120 & 140 & 180 & 200 & 180 \\ 114 & 120 & 120 & 160 & 160 & 200 & 210 & 180 \\ 114 & 100 & 80 & 80 & 92 & 92 & 120 & 160 \\ 90 & 64 & 70 & 90 & 80 & 80 & 60 & 70 \\ 50 & 40 & 48 & 70 & 64 & 50 & 60 & 60 \\ 90 & 80 & 80 & 70 & 80 & 120 & 140 & 140 \\ 110 & 80 & 90 & 114 & 114 & 110 & 100 & 140 \\ 104 & 100 & 80 & 80 & 80 & 90 & 108 & 128 \end{bmatrix}$

$e(m,n,i)$ = Cadrul curent − Cadrul referință (de codat)

$e(m,n,i) = \begin{bmatrix} -6 & -8 & 0 & -20 & -20 & -20 & -10 & -12 \\ -6 & 0 & -10 & -4 & -4 & 0 & -10 & 0 \\ -6 & 0 & 0 & 0 & 12 & +2 & 0 & -4 \\ -10 & -6 & 70 & 26 & 16 & 20 & 0 & -30 \\ -20 & -20 & 16 & 38 & 32 & 18 & 0 & -10 \\ -10 & 0 & 0 & 0 & 10 & 20 & 8 & 8 \\ 10 & -10 & 0 & 14 & 14 & 10 & 0 & 8 \\ 4 & 0 & -10 & 0 & 0 & 0 & 8 & -8 \end{bmatrix}$

& transmite $\hat{e}(m,n) = \begin{cases} e(m,n) \text{ dacă } |e(m,n)| > \eta \\ 0, \text{ altfel.} \end{cases}$

$E = \begin{bmatrix} 0 & 0 & 0 & -20 & -20 & -20 & 0 & -12 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 12 & 0 & 0 & 0 \\ 0 & 0 & 0 & 26 & 16 & 20 & 0 & -30 \\ -20 & -20 & 16 & 38 & 32 & 18 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 20 & 0 & 0 \\ 0 & 0 & 0 & 14 & 14 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

b) Codul reconstituit = Codul de referință ≠ E (mod ~~cuantiz~~ de eroare)

$$\text{Codul reconstituit} = \begin{vmatrix} 120 & 128 & 120 & 120 & 140 & 180 & 210 & 80 \\ 120 & 120 & 130 & 164 & 164 & 200 & 200 & 180 \\ 120 & 100 & 80 & 80 & 92 & 90 & 120 & 164 \\ 100 & 70 & 60 & 90 & 80 & 80 & 60 & 70 \\ 50 & 40 & 48 & 70 & 64 & 50 & 60 & 70 \\ 100 & 80 & 80 & 70 & 70 & 120 & 132 & 132 \\ 100 & 90 & 90 & 114 & 114 & 100 & 100 & 132 \\ 100 & 100 & 90 & 80 & 80 & 90 & 100 & 132 \end{vmatrix}$$

MSE. (bl. decodat - reconstituit și bl. original din codul curent).

$$MSE = \frac{1}{8\times 8}\sum_{i,j}^{8,8}\left(C_{Reconstituit}(i,j) - C_{Curent}(i,j)\right)^2$$

~~$MSE = \frac{1}{64}$~~

$$C_{Reconst} - C_{Curent} = \begin{vmatrix} -6 & 8 & 0 & 0 & 0 & 0 & 10 & 0 \\ -6 & 0 & 10 & 4 & 4 & 0 & -10 & 0 \\ -6 & 0 & 0 & 0 & 0 & -2 & 0 & 4 \\ -10 & 6 & -10 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 10 \\ 10 & 0 & 0 & 0 & -10 & 0 & -8 & -8 \\ -10 & 10 & 0 & 0 & 0 & -10 & 0 & -8 \\ -4 & 0 & 10 & 0 & 0 & -20 & -8 & -4 \end{vmatrix}$$

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$$MSE = \frac{1}{64}\left(36\cdot 4 + 100\cdot 12 + 16\cdot 5 + 64\cdot 5 + 4\cdot 1\right) = \frac{1}{64}(144 + 1200 + 80 + 320 + 4) = \frac{1}{64}\cdot 1748 = 27{,}31.$$