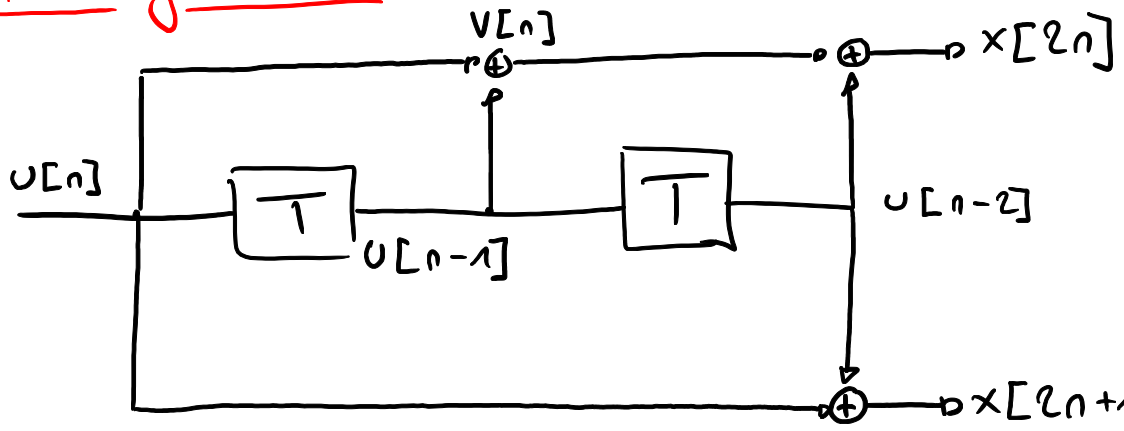
Faltungscodes



(7,5)

n	$2n$	$2n+1$
0	0	1
1	2	3
2	4	5

$R = 1/2$

ist linear

ist nicht systematisch & nicht zyklisch

Ordnung $m = 2$ (Anzahl Flipflops)

Praxis

- Strom $u[n]$ wird in Blöcke der Länge k geteilt.
- Initialzustand $u[n-1], u[n-2], \ldots = 0$

Um Tailbits an $\underline{u}$ anhängen ($= 0$)

Bsp:

$\underline{u} = [1011]$ + $m = 2$ Tailbits

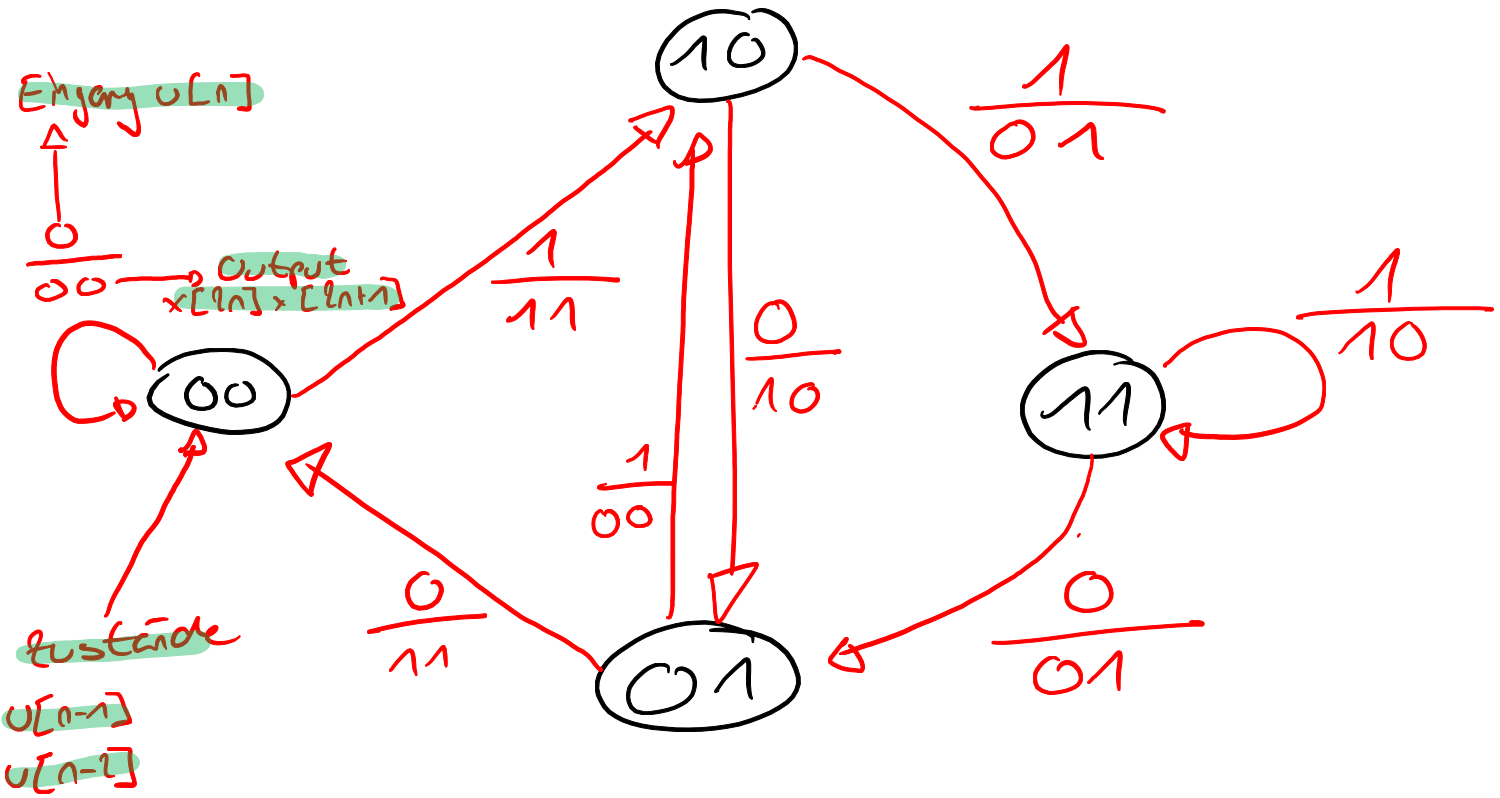
$\underline{u}^* = [101100]$

n	u[n]	u[n-1]	u[n-2]	v[n]	x[2n]	x[2n+1]
0	1	0	0	1	1	1
1	0	1	0	1	1	0
2	1	0	1	1	0	0
3	1	1	0	0	0	1
4	0	1	1	1	0	1
5	0	0	1	0	1	1

0 0 1

$\underline{c} = [11\ 10\ 00\ 01\ 01\ 11]$

x[2n] x[2n+1]



$u = [1\ 0\ 1\ 1]$

$u^+ = [1\ 0\ 1\ 1\ 0\ 0]$

$x = [11\ 10\ 00\ 01\ 01\ 11]$

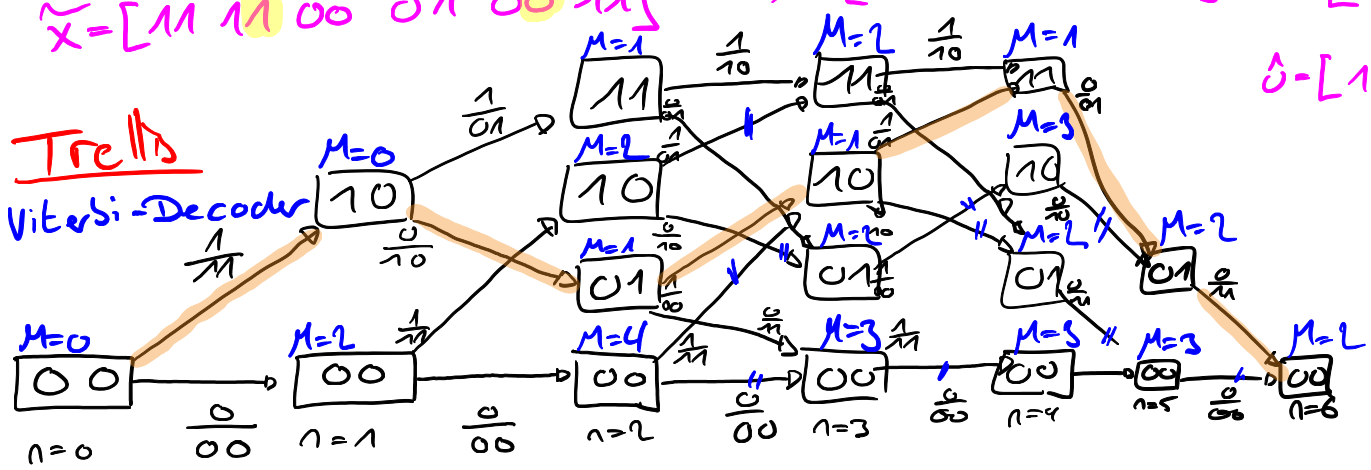
$\tilde{x} = [11\ 11\ 00\ 01\ 00\ 11]$

$\hat{x} = [11\ 10\ 00\ 01\ 11]$ $\hat{u}^+ = [1\ 0\ 1\ 0\ 0]$

$\hat{u} = [1\ 0\ 1\ 1]$

Trellis

Viterbi-Decoder



$\hat{u}^+$ = inkl. Tailbits

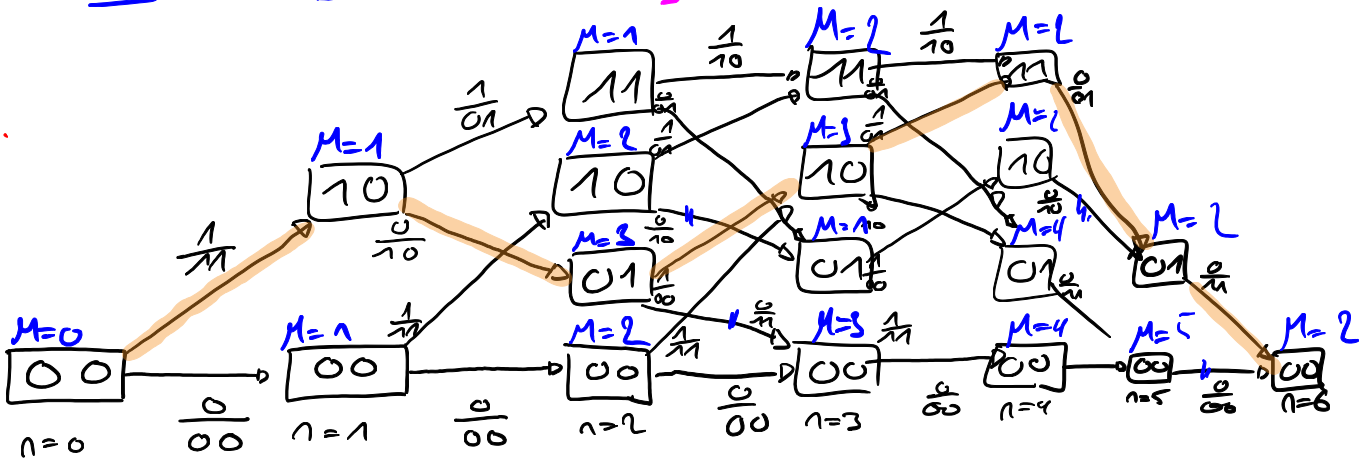
$d_{free} = 5$

4 Fehler erkennbar

2 Fehler korrigierbar

OFD = "optimum free distance"

$\tilde{x} = [10\ 01\ 01\ 10\ 01\ 11]$



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