Data Compression

Seminar @ Wolfgang Goethe University Frankfurt

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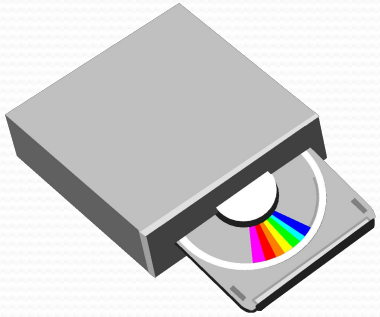
Digital Signal Processing

Analog Signal



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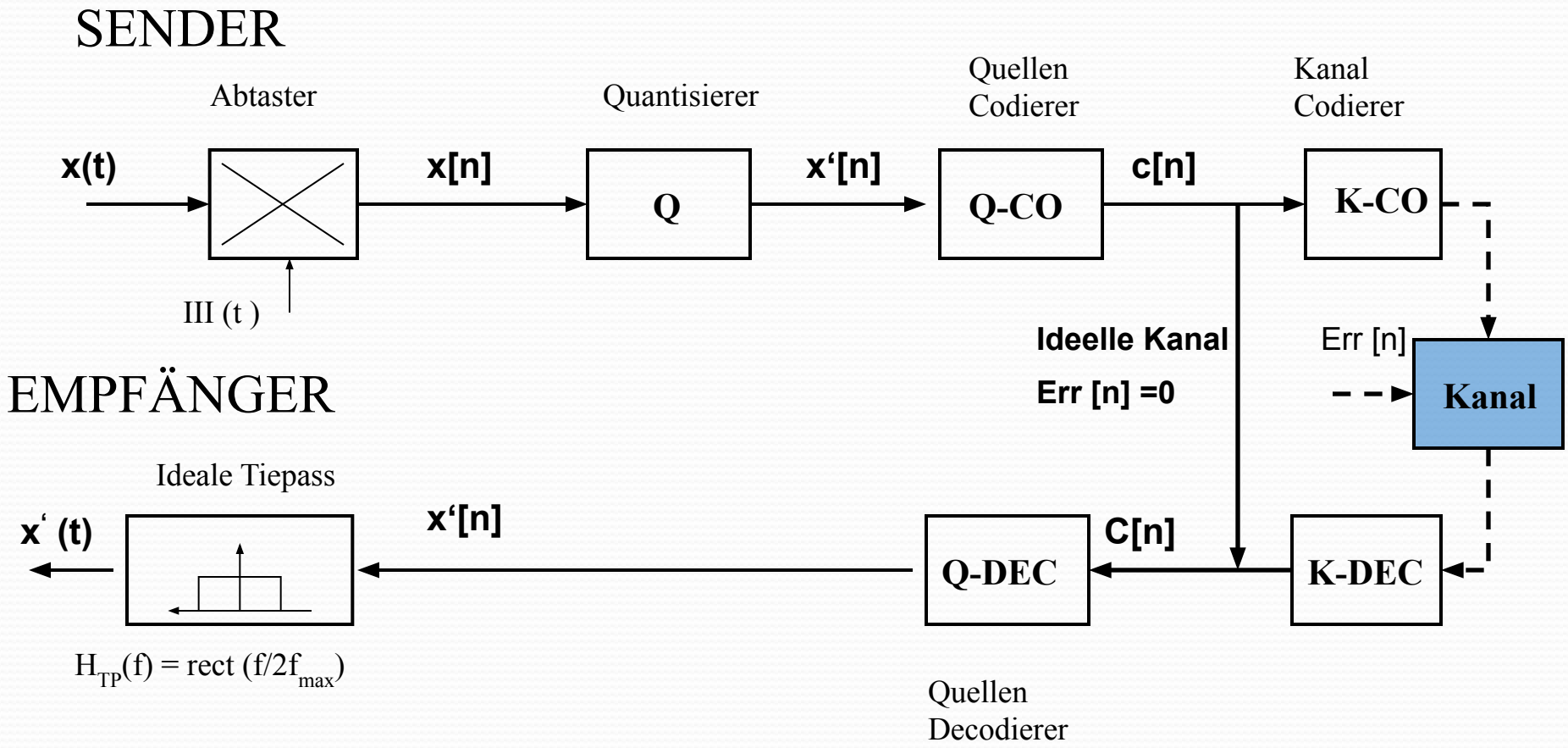
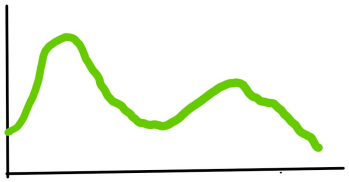
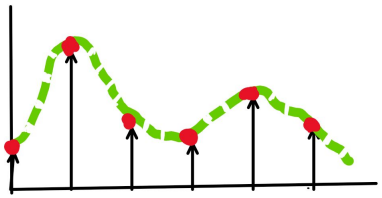
Digital Signal

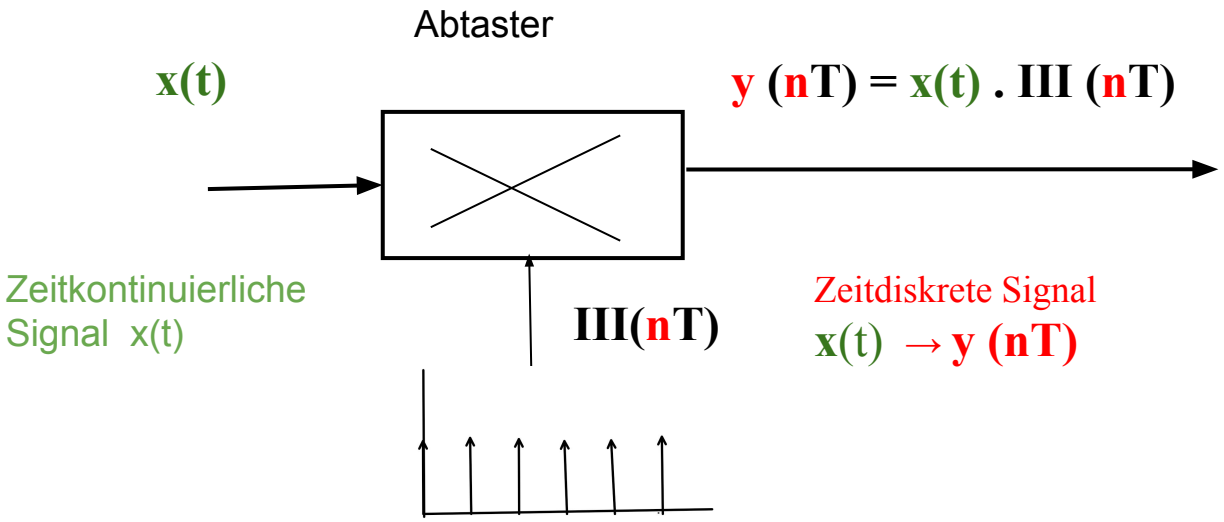
Digitale Signalübertragungssystem
-Quellen Codierung-



Zeitdiskrete Signal: Abtastung

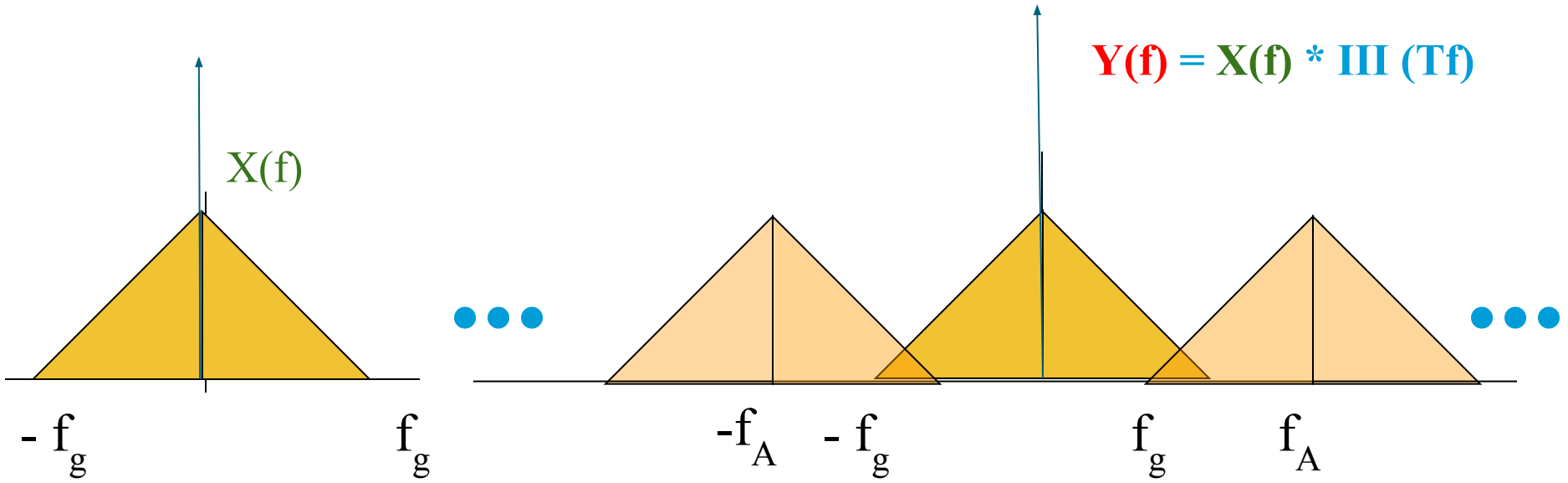






Shar Funktion III (t) {=1 bei nT, sonst =0}

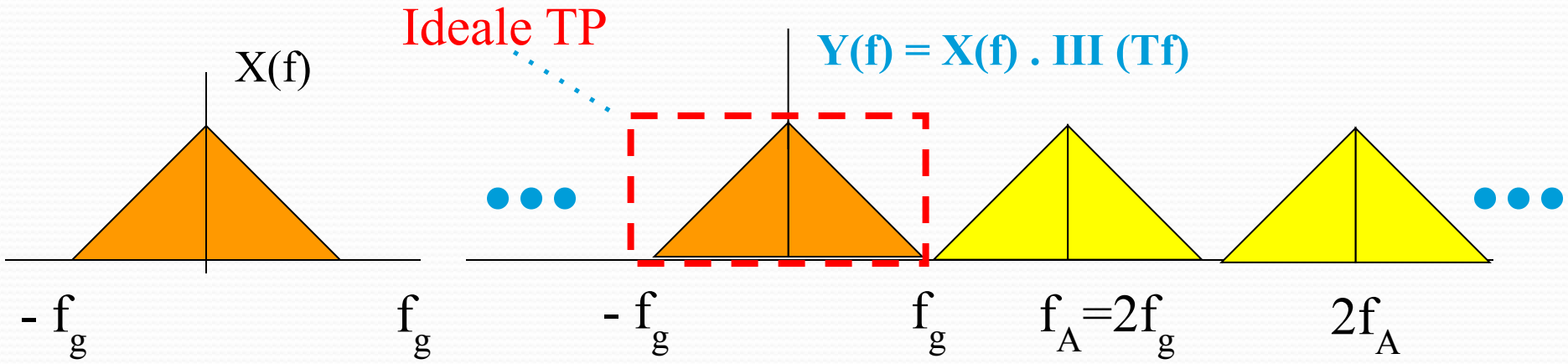
Spektrum des abgetasteten Signals



f_g : Grenzfrequenz von x(t)

f_A : Abtastfrequenz, $f_A = 1/T$

Spektrum des abgetasteten Signals

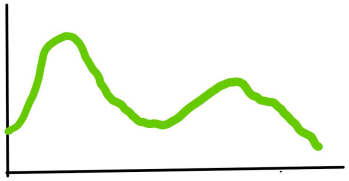


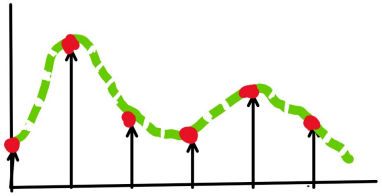
f_g : Grenzfrequenz von x(t)

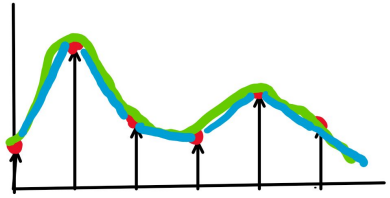
f_A : Abtastfrequenz, $f_A = 1/T$

Abtast Theorem $f_A = 2\, f_g$

Abgestaste Signal rekonsktruieren

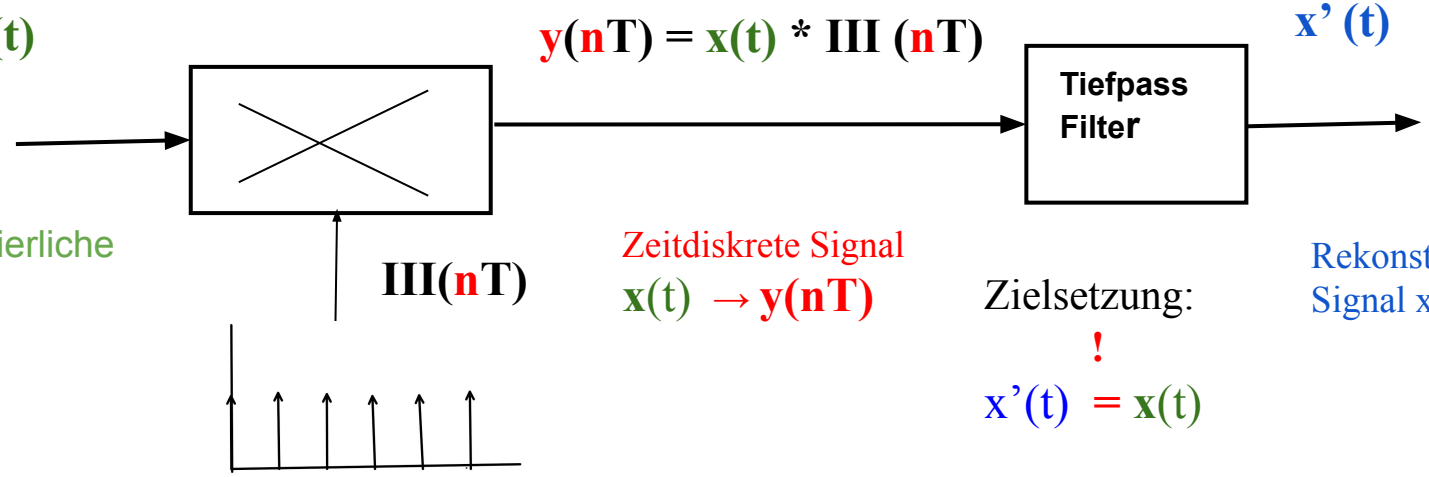






Abtaster

Interpolation



Zeitkontinuierliche Signal x(t)

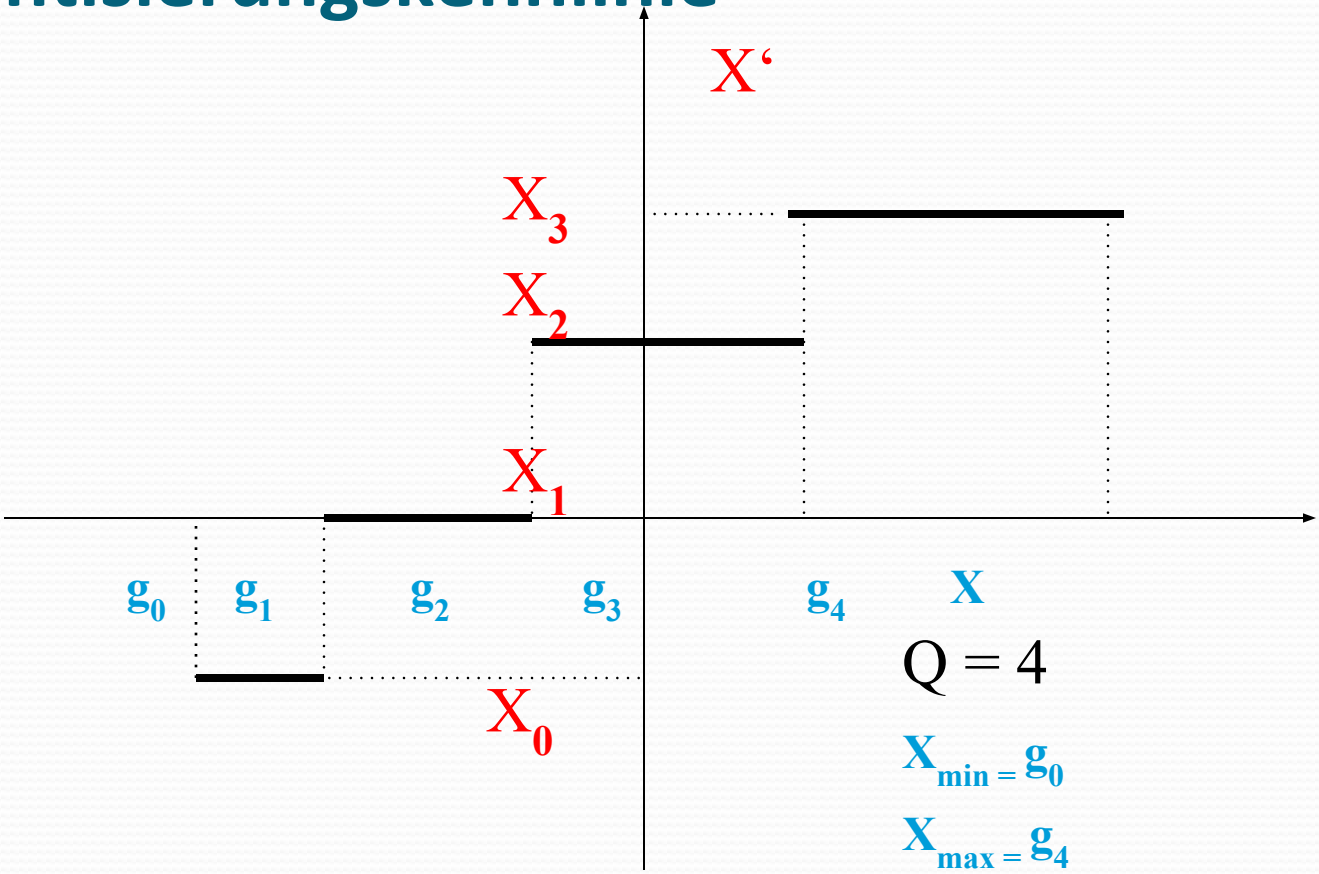
Zeitdiskrete Signal
$x(t) \rightarrow y(nT)$

Zielsetzung:
!
$x'(t) = x(t)$

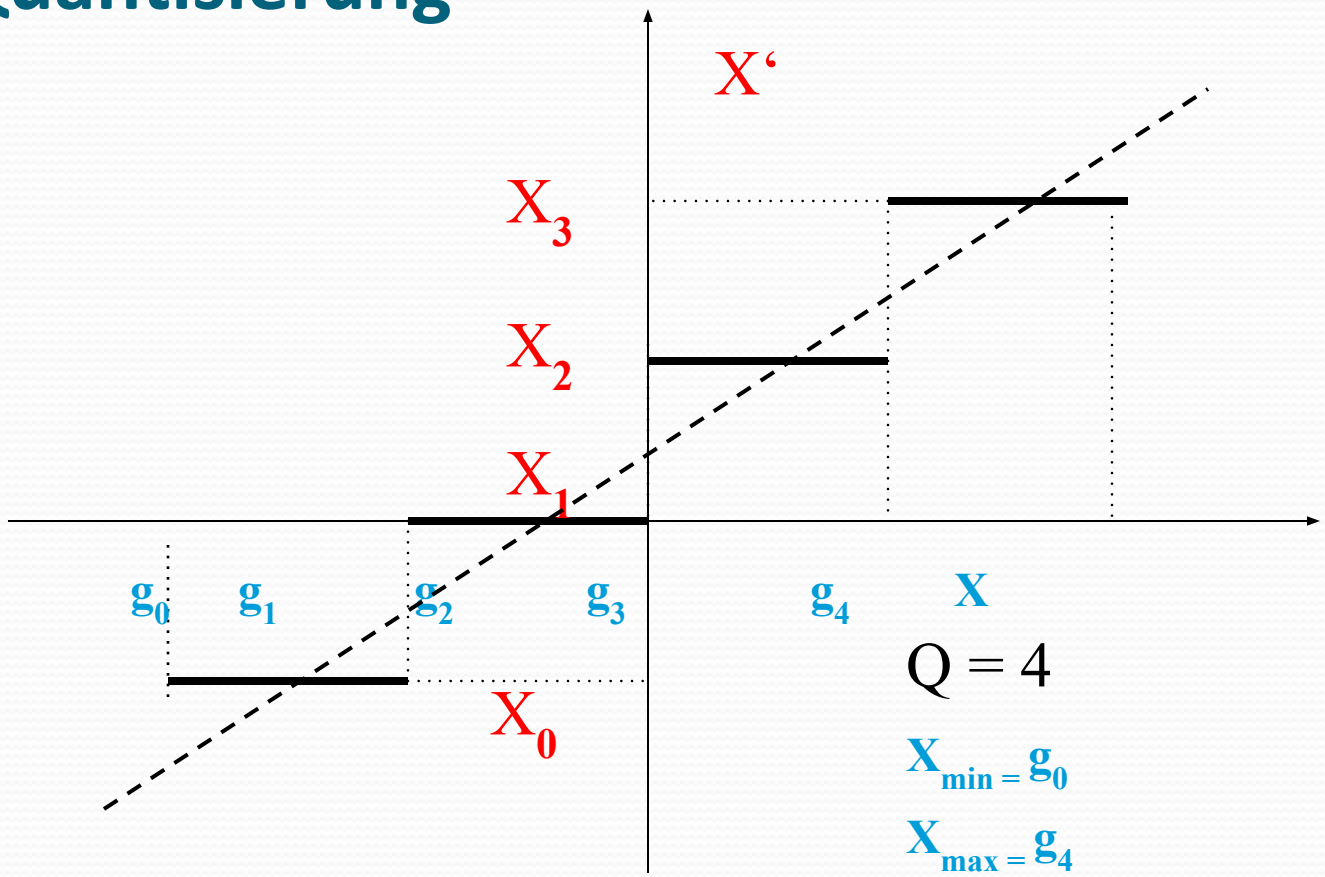
Rekonstruierte Signal x' (t)

Shar Funktion III (t) {=1 bei nT, sonst =0}

Linare Quantisierungskennlinie



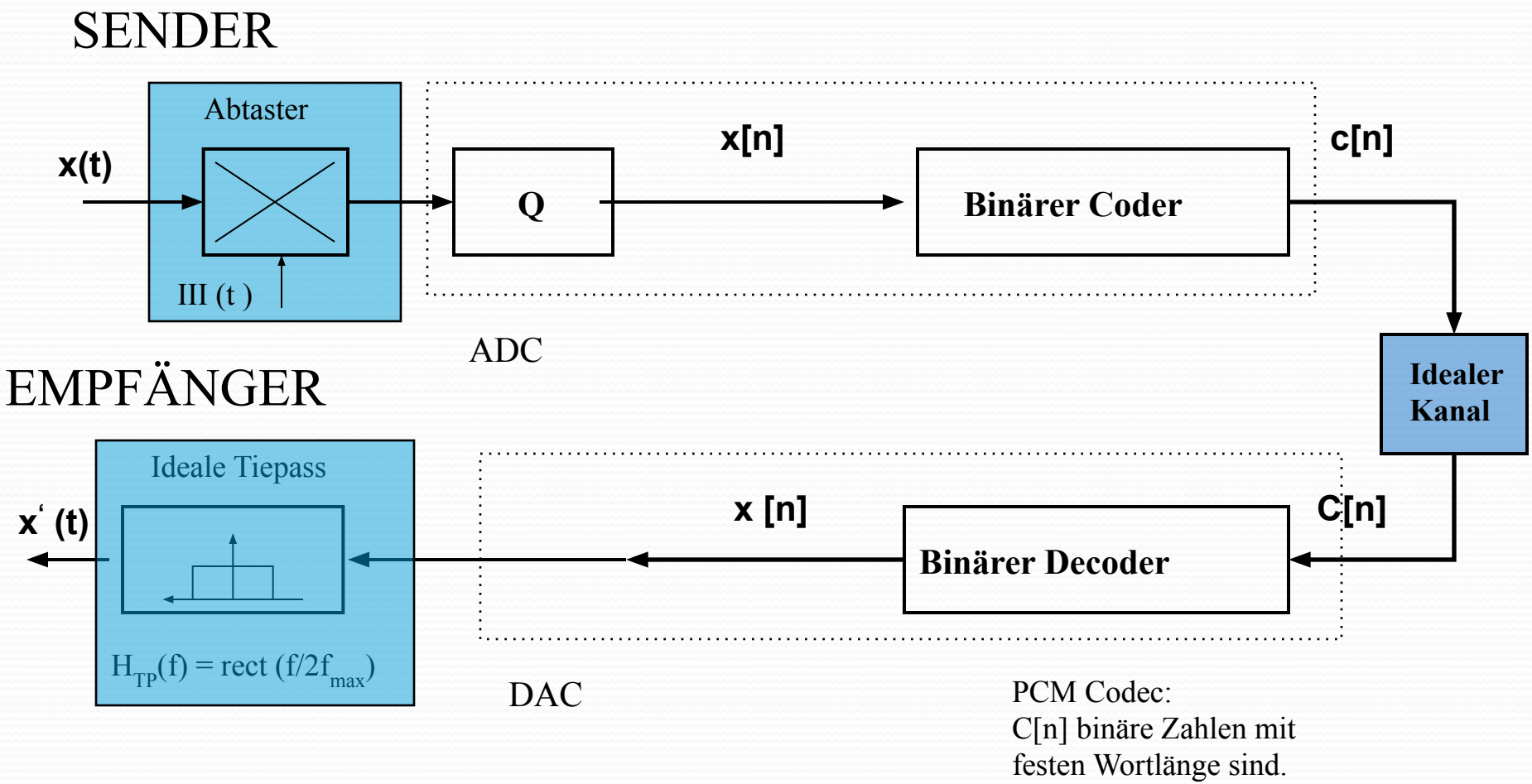
Quantisierungskennlinie
- Lineare Quantisierung -



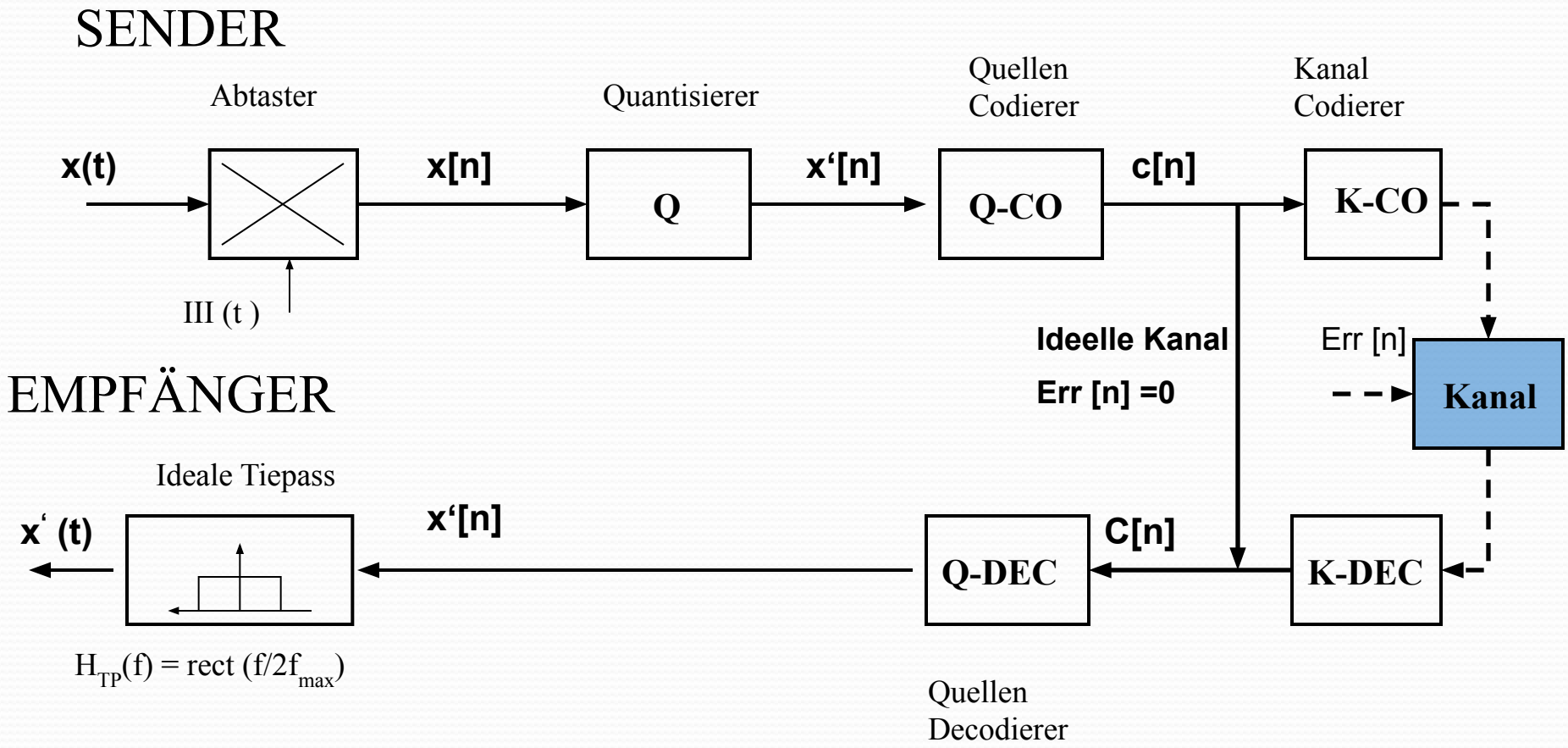
Binäre Codierung
- nach der Quantisierung-

Originalwerte	Ersatzwerte x_q	Zahl q	Zuübertragende binäre Code
$g_0 \leq X[nT] \leq g_1$	X_0	0	000
$g_1 \leq X[nT] \leq g_2$	X_1	1	001
$g_3 \leq X[nT] \leq g_3$	X_2	2	010
$g_4 \leq X[nT] \leq g_4$	X_3	3	011
$g_4 \leq X[nT] \leq g_5$	X_4	4	100
$g_5 \leq X[nT] \leq g_6$	X_5	5	101
$g_6 \leq X[nT] \leq g_7$	X_6	6	110
$g_7 \leq X[nT] \leq g_8$	X_7	7	111

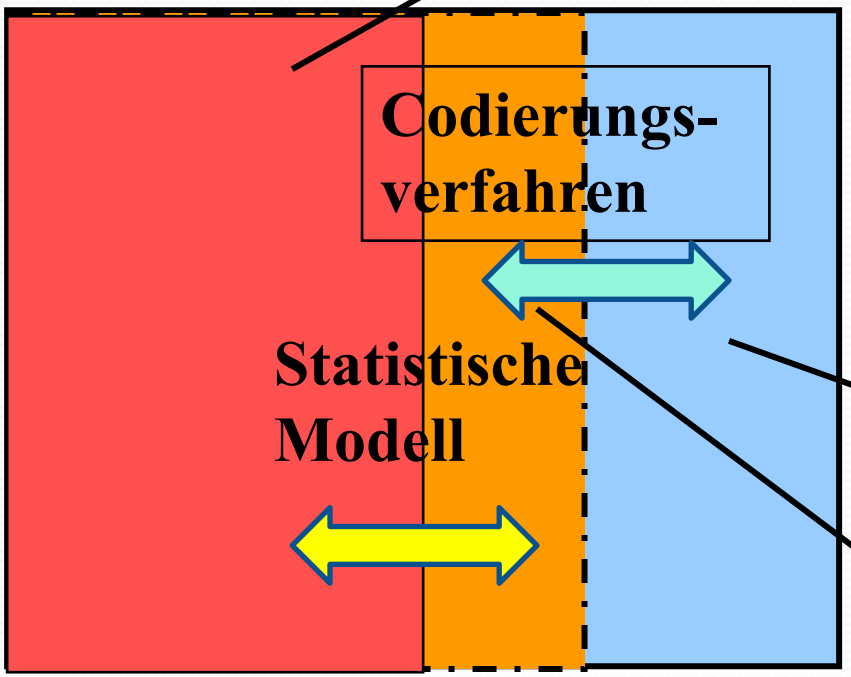
Quellen Codierung
- PCM: Pulse Code Modulation -



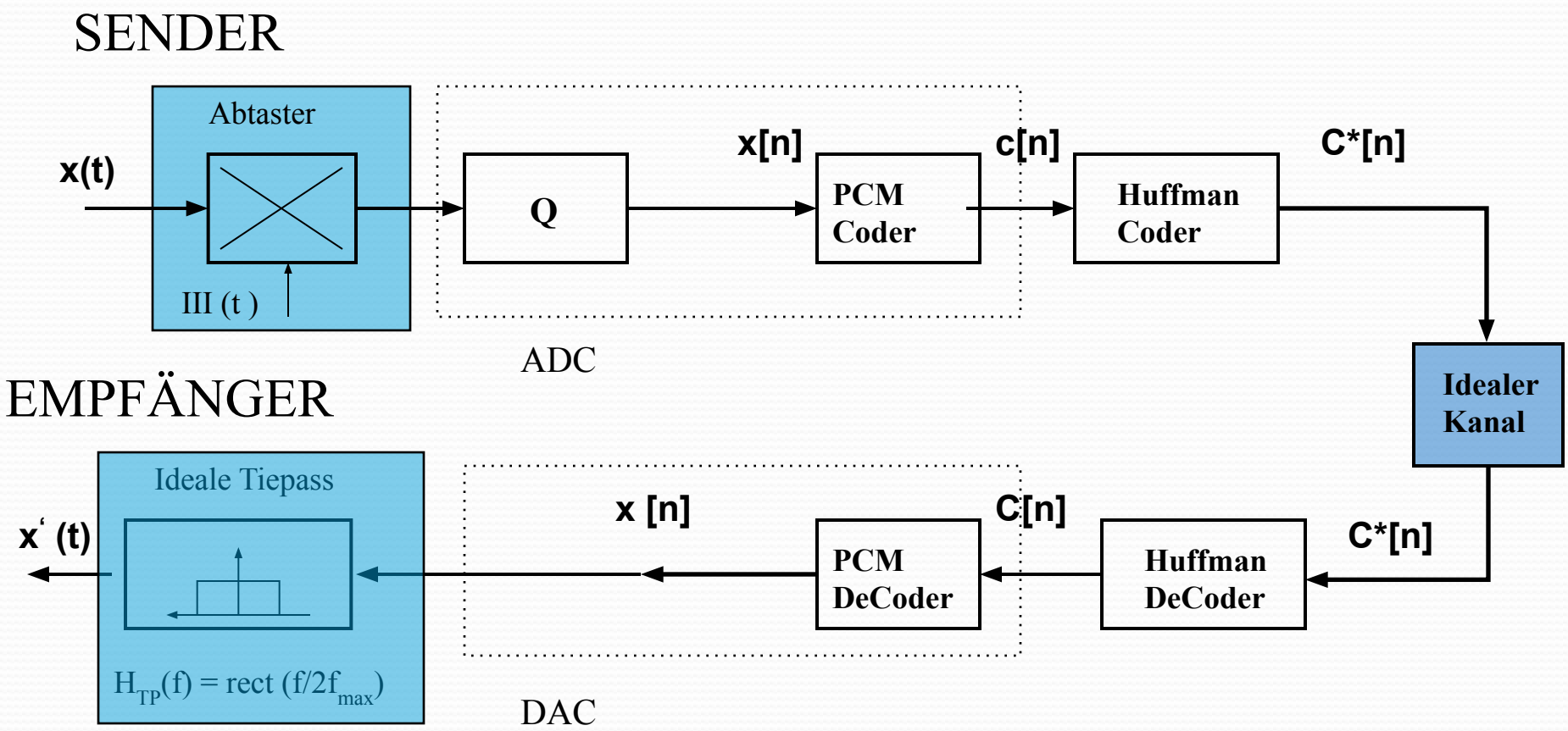
Digitale Signalübertragungssystem
-Quellen Codierung-



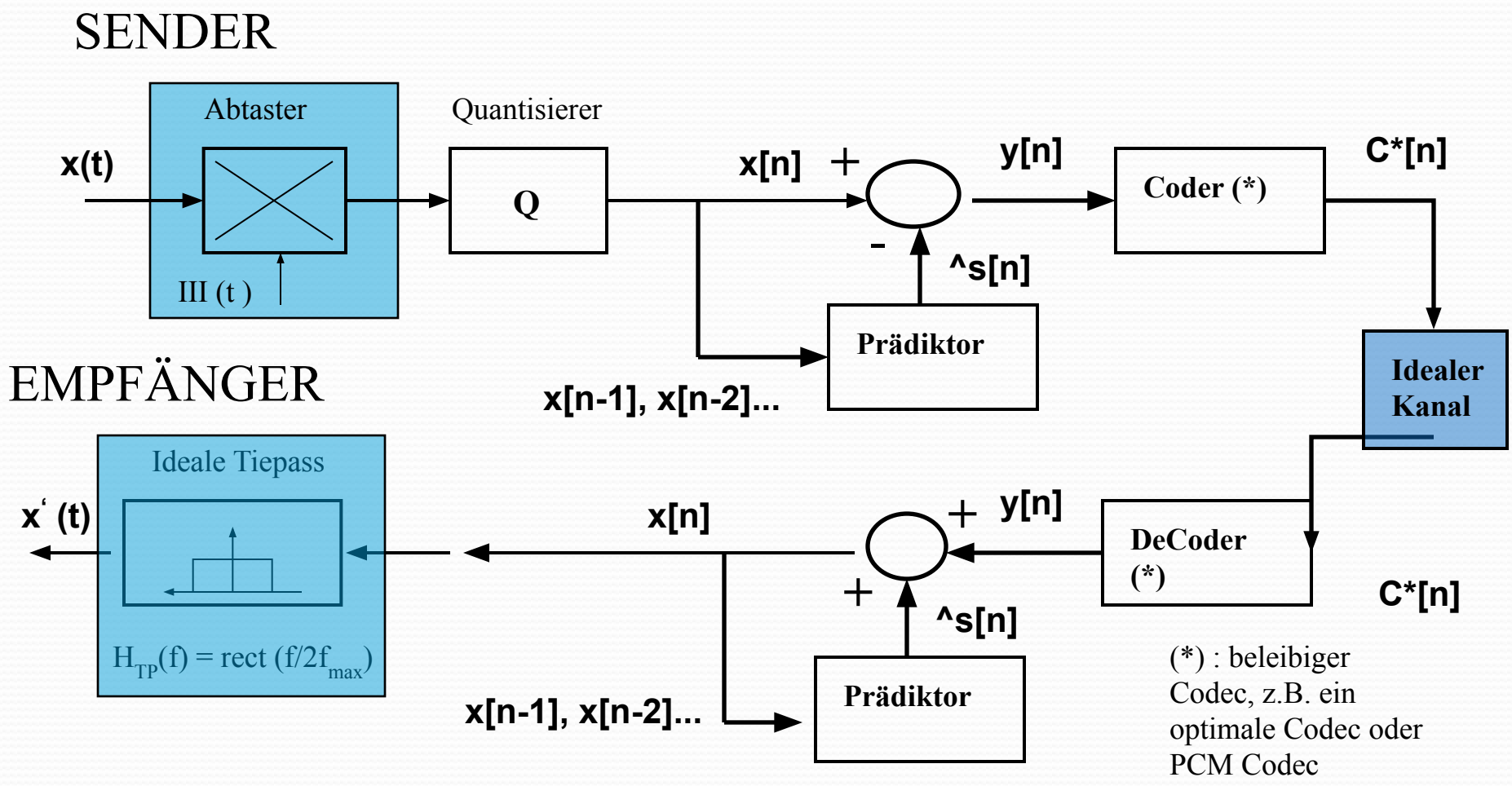
Redundanz Reduzierung



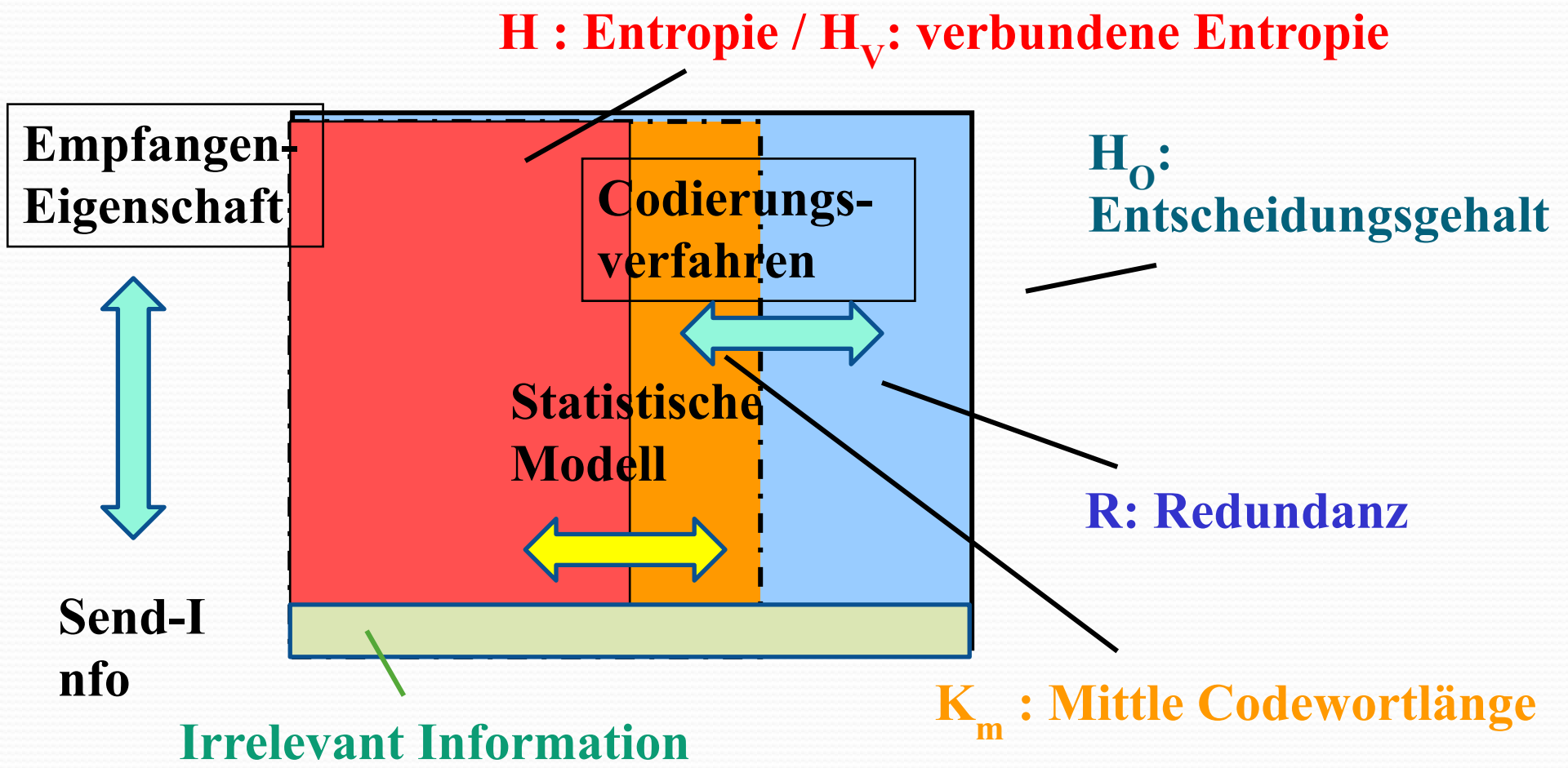
Quellen Codierung
- Optimale Codierung -



Quellen Codierung
-Prädiktion Verfahren -



Irrelevante Reduzierung



Data compression: a complex subject

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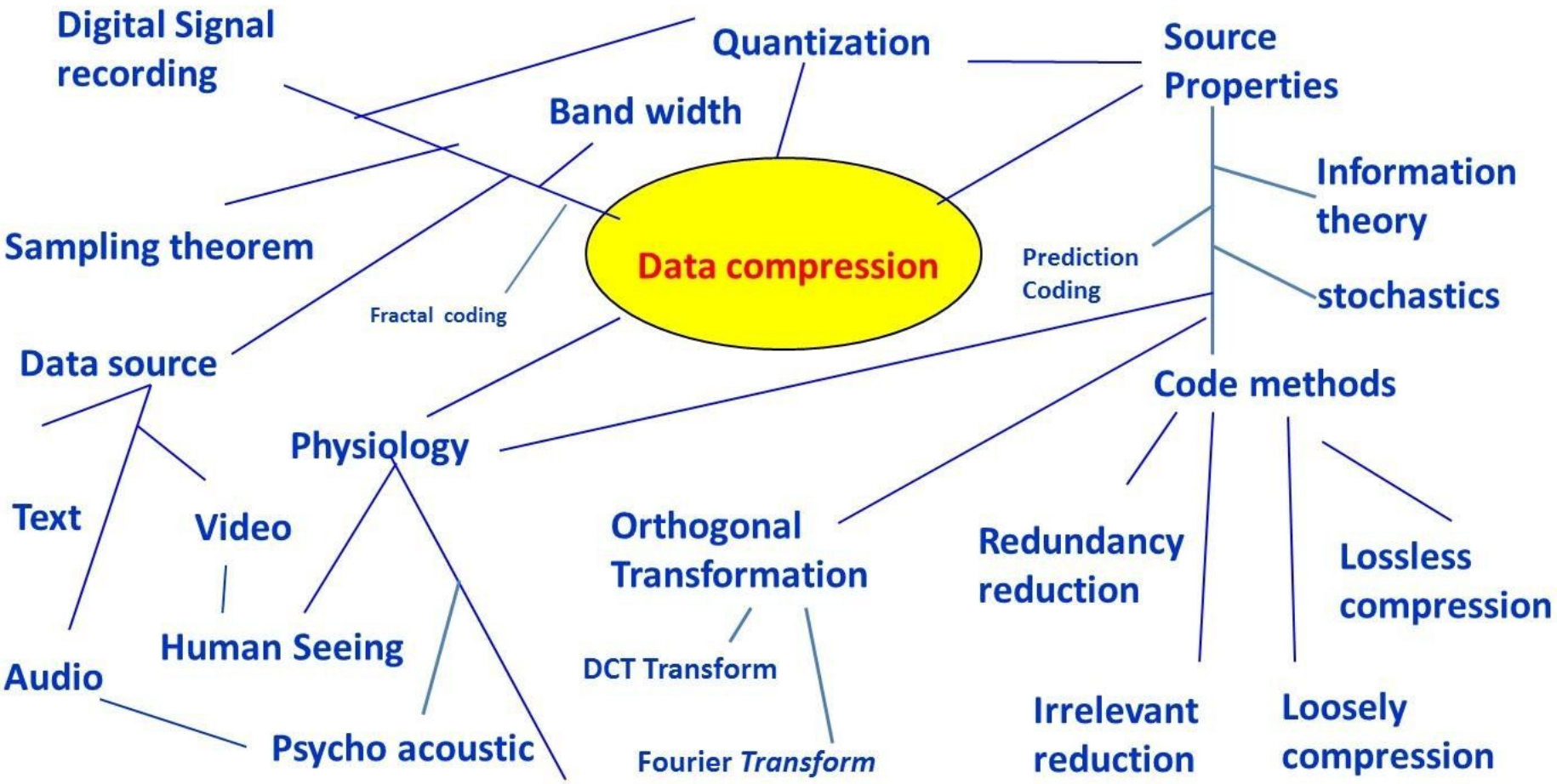

E-Learning Simulator:VUONG-DCP