

Audio 3.1 DeltaKompression

d)

i. Fehler bei Quantisierung von 1

Play/Pause Übung3: A-Generator - Deltakompression Quant-Faktor(1,2,4,8,16,...4096, off: 66000): 1

Logging of:

```
AudioTestArray:      0.0000, 0.1000, 0.2000, 0.3000, 0.4000, 0.5000, 0.6000, 0.7000,
DeltaSamplesP:       0.0000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0
QuantSamplesP:       0.0000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0
iQuantSamplesP:      0.0000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0
iDeltaSamplesP:      0.0000, 0.1000, 0.2000, 0.3000, 0.4000, 0.5000, 0.6000, 0.7000, 0.7000, 0.7000, 0.7000, 0.7000, 0.
ErrorLog:            0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000,
Error - SAD: 0.00, MSE: 0.00, PSNR: 0.00
```

ii. Fehler bei Quantisierung von 8

Play/Pause Übung3: Audio - Deltakompression Quant-Faktor(1,2,

Logging of:

```
monoSamples:         0.0063, 0.0068, 0.0058, 0.0045, 0.0034, 0.0026, 0.0017, 0.00
DeltaSamplesP:        0.0063, 0.0005, -0.0010, -0.0014, -0.0010, -0.0009, -0.000
QuantSamplesP:        0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.
iQuantSamplesP:       0.0082, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0
iDeltaSamplesP:       0.0082, 0.0082, 0.0082, 0.0082, 0.0082, 0.0082, 0.0082, 0
ErrorLogP:            0.0019, 0.0014, 0.0023, 0.0037, 0.0047, 0.0056, 0.0065, 0.0072
Error - SAD: NaN.00, MSE: NaN.00, PSNR: NaN.00
-----Compression Data -----
Original Wortbreite: 1 Bit , Codec Wortbreite: 1 Bit
TP-Quant-Wortbreite = 2 Bit, HP-Quant-Wortbreite = 3 Bit
TP-Codec-Wortbreite = 4 Bit, HP-Codec-Wortbreite = 5 Bit
Datarate at AudioBuffer (16384, Ch: 1): Original: 6 MBit/s, Codec: 9 MBit/s
Kompressionsrate: 1 : 10
```

Audio 3.2 SubbandKompression

c)

i. Fehler bei Quantisierung von 1

Play/Pause

Übung3: A-Generator - Subbandkompression

Quant-Faktor(1,2,4,8,16,...4096, off: 66000):

1

Log

Logging of:

```
AudioTestArray: 0.0000, 0.1000, 0.2000, 0.3000, 0.4000, 0.5000, 0.6000, 0.7000,
DeltaSamplesP: 0.0000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.0000, 0.0000, 0.0000,
QuantSamplesP: 0.0000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.0000, 0.0000, 0.0000,
iQuantSamplesP: 0.0000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.1000, 0.0000, 0.0000, 0.0000,
iDeltaSamplesP: 0.0000, 0.1000, 0.2000, 0.3000, 0.4000, 0.5000, 0.6000, 0.7000, 0.7000, 0.7000, 0.7000,
ErrorLog: 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000,
Error - SAD: 0.00, MSE: 0.00, PSNR: 0.00
```

[Measurment Video](#) [Measurment Audio](#)

ii. Fehler bei Quantisierung von 8

Play/Pause

Übung3: A-Generator - Subbandkompression

Quant-Faktor(1,2,4,8,16,...4096, off: 66000):

8

Log

Logging of:

```
AudioTestArray: 0.0000, 0.1000, 0.2000, 0.3000, 0.4000, 0.5000, 0.6000, 0.7000,
ALengthSamples: 0.0000, 0.1000, 0.2000, 0.3000, 0.4000, 0.5000, 0.6000, 0.7000, 0.0000,
TPsamples: 0.0000, 0.0500, 0.1500, 0.2500, 0.3500, 0.4500, 0.5500, 0.6500, 0.3500,
HPsamples: 0.0000, 0.0500, 0.0500, 0.0500, 0.0500, 0.0500, 0.0500, 0.0500, -0.3500,
TPdownsamples: 0.0000, 0.1500, 0.3500, 0.5500, 0.3500,
HPdownsamples: 0.0000, 0.0500, 0.0500, 0.0500, -0.3500,
TPquantsamples: 0.0000, 0.0188, 0.0437, 0.0688, 0.0437,
HPquantsamples: 0.0000, 0.0500, 0.0500, 0.0500, -0.3500,
TPIquantsamples: 0.0000, 0.1500, 0.3500, 0.5500, 0.3500,
HPIquantsamples: 0.0000, 0.0500, 0.0500, 0.0500, -0.3500,
TPupsamples: 0.0000, 0.0000, 0.1500, 0.0000, 0.3500, 0.0000, 0.5500, 0.0000, 0.3500,
HPupsamples: 0.0000, 0.0000, 0.0500, 0.0000, 0.0500, 0.0000, 0.0500, 0.0000, -0.3500,
ATPOutsamples: 0.0000, 0.0000, 0.0750, 0.0750, 0.1750, 0.1750, 0.2750, 0.2750, 0.1750,
AHPOutsamples: 0.0000, 0.0000, -0.0250, 0.0250, -0.0250, 0.0250, -0.0250, 0.0250, 0.1750,
MixOutSamples: 0.0000, 0.0000, 0.0500, 0.1000, 0.1500, 0.2000, 0.2500, 0.3000, 0.3500,
DelaySamples: 0.0000, 0.0500, 0.1000, 0.1500, 0.2000, 0.2500, 0.3000, 0.3500,
ScaleSamples: 0.0000, 0.1000, 0.2000, 0.3000, 0.4000, 0.5000, 0.6000, 0.7000,
ErrorLog: 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000,
Error - SAD: 0.00, MSE: 0.00, PSNR: 0.00
```

Audio 3.3 FFT

c)

i. Fehler bei Quantisierung von TP: 1 HP: 1 Grenzwert: 1

Play/Pause Übung3: A-Generator - oneHz4 - FFT-Kompression ▾ Quant-Faktor(1,2,4,8,16,... 24 Bit. , off: 88888888):

1 HP-Quant-Faktor: 1 Grenzfrequ.(1-2 Hz): 1 Log

Logging of:

```
oneHzAudio:      1.0000, 0.4200, -0.4200, -1.0000, -1.0000, -0.4200, 0.4200, 1.0000,
QuantMatrix:      1.0000, 1.0000, 1.0000, 1.0000, 1.0000, 1.0000, 1.0000, 1.0000,
FFTKoef.spectrumLong:  0.0000, 5.6684, 0.0000, 0.0279, 0.0000, 0.0279, 0.0000, 5.6684,
QuantFFT.spectrumLong:  0.0000, 5.6684, 0.0000, 0.0279, 0.0000, 0.0279, 0.0000, 5.6684,
iQuantFFT.spectrumLong:  0.0000, 5.6684, 0.0000, 0.0279, 0.0000, 0.0279, 0.0000, 5.6684,
iInverseFFT:      1.0000, 0.4200, -0.4200, -1.0000, -1.0000, -0.4200, 0.4200, 1.0000,
ErrorLog:         0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000,
Error - SAD: 0.00, MSE: 0.00, PSNR: 0.00
```

ii. Fehler bei Quantisierung von TP: 16 HP: 32 Grenzwert: 1

Play/Pause Übung3: A-Generator - oneHz4 - FFT-Kompression ▾ Quant-Faktor(1,2,4,8,16,... 24 Bit. , off: 88888888):

16 HP-Quant-Faktor: 32 Grenzfrequ.(1-2 Hz): 1 Log

Logging of:

```
oneHzAudio:      1.0000, 0.4200, -0.4200, -1.0000, -1.0000, -0.4200, 0.4200, 1.0000,
QuantMatrix:      16.0000, 32.0000, 32.0000, 32.0000, 32.0000, 32.0000, 32.0000, 32.0000,
FFTKoef.spectrumLong:  0.0000, 5.6684, 0.0000, 0.0279, 0.0000, 0.0279, 0.0000, 5.6684,
QuantFFT.spectrumLong:  0.0000, 0.1771, 0.0000, 0.0009, 0.0000, 0.0009, 0.0000, 0.1771,
iQuantFFT.spectrumLong:  0.0000, 5.6685, 0.0000, 0.0282, 0.0000, 0.0282, 0.0000, 5.6685,
iInverseFFT:      1.0000, 0.4201, -0.4200, -1.0000, -1.0000, -0.4201, 0.4200, 1.0000,
ErrorLog:         0.0000, 0.0001, 0.0000, 0.0000, 0.0000, -0.0001, 0.0000, 0.0000,
Error - SAD: 0.00, MSE: 0.00, PSNR: 0.00
```

1500

Play/Pause

Übung3: Audio - Subbandkompression

▼ TP-Quant-Faktor(1,2,4,8,16,...4096. , off: 66000): 1500

HP-Quant-Faktor: 1

Logging of:

monoSamples:

0.0058, 0.0080, 0.0110, 0.0140, 0.0171, 0.0206, 0.0249, 0.0302, 0.0352, 0.0379, 0.0379, 0.0369, 0.0372, 0.0390, 0.0411, 0.0

ALengthSamplesP:

0.0058, 0.0080, 0.0110, 0.0140, 0.0171, 0.0206, 0.0249, 0.0302, 0.0352, 0.0379, 0.0379, 0.0369, 0.0372, 0.0390, 0.0411,

TPsamplesP:

0.0029, 0.0069, 0.0095, 0.0125, 0.0156, 0.0189, 0.0228, 0.0275, 0.0327, 0.0365, 0.0379, 0.0374, 0.0370, 0.0381, 0.0401, 0.04

HPsamplesP:

0.0058, 0.0011, 0.0015, 0.0015, 0.0016, 0.0017, 0.0022, 0.0026, 0.0025, 0.0014, 0.0000, -0.0005, 0.0001, 0.0009, 0.0011, 0.0

TPdownsamplesP:

0.0029, 0.0095, 0.0156, 0.0228, 0.0327, 0.0379, 0.0370, 0.0401, 0.0433, 0.0472, 0.0533, 0.0547, 0.0482, 0.0403, 0.0325,

HPdownsamplesP:

0.0058, 0.0015, 0.0016, 0.0022, 0.0025, 0.0000, 0.0001, 0.0011, 0.0006, 0.0015, 0.0013, -0.0008, -0.0021, -0.0018, -0.00

TPquantsamplesP:

0.0000, 0.0000, 0.0000, 0.0000, 0.0001, 0.0001, 0.0001, 0.0001, 0.0001, 0.0001, 0.0001, 0.0001, 0.0001, 0.0001, 0.0001,

HPquantsamplesP:

0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000,

TPIquantsamplesP:

0.0051, 0.0102, 0.0154, 0.0205, 0.0307, 0.0358, 0.0358, 0.0410, 0.0410, 0.0461, 0.0512, 0.0563, 0.0461, 0.0410, 0.0307

HPIquantsamplesP:

0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000,

TPupsamplesP:

0.0051, 0.0000, 0.0102, 0.0000, 0.0154, 0.0000, 0.0205, 0.0000, 0.0307, 0.0000, 0.0358, 0.0000, 0.0358, 0.0000, 0.0410, 0.

HPupsamplesP:

0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.

ATPOutsamplesP:

0.0026, 0.0026, 0.0051, 0.0051, 0.0077, 0.0077, 0.0102, 0.0102, 0.0154, 0.0154, 0.0179, 0.0179, 0.0179, 0.0179, 0.0205,

AHPQuantsamplesP:

0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000,

MixOutSamplesP:

0.0026, 0.0026, 0.0051, 0.0051, 0.0077, 0.0077, 0.0102, 0.0102, 0.0154, 0.0154, 0.0179, 0.0179, 0.0179, 0.0179, 0.0205,

DelaySamplesP:

0.0026, 0.0051, 0.0051, 0.0077, 0.0077, 0.0102, 0.0102, 0.0154, 0.0154, 0.0179, 0.0179, 0.0179, 0.0179, 0.0205, 0.0205,

ScaleSamplesP:

0.0051, 0.0102, 0.0102, 0.0154, 0.0154, 0.0205, 0.0205, 0.0307, 0.0307, 0.0358, 0.0358, 0.0358, 0.0358, 0.0410, 0.0410, 0.

ErrorLogP:

-0.0006, 0.0022, -0.0007, 0.0014, -0.0018, -0.0001, -0.0044, 0.0006, -0.0045, -0.0021, -0.0020, -0.0010, -0.0013, 0.0019, -0.

Error - SAD: NaN.00, MSE: NaN.00, PSNR: NaN.00

-----Compression Data -----

Original Wortbreite: 1 Bit , Codec Wortbreite: 1 Bit

TP-Quant-Wortbreite = 2 Bit, HP-Quant-Wortbreite = 3 Bit

TP-Codec-Wortbreite = 4 Bit, HP-Codec-Wortbreite = 5 Bit

Datarate at AudioBuffer (16384, Ch: 1): Original: 6 MBit/s, Codec: 9 MBit/s

Kompressionsrate: 1 : 10

c) Wortbreite bei der optimalen Quantisierung

16 bit

d) Datenrate bei 48kHz

$48000\text{Hz} \cdot 1 \text{ channel} \cdot 11 \text{ bit}$

Berechnen der Compression Ratio:

e) Kompression

16:11 weil 16 bit auf 11 bit reduziert wurden.

f) Measurement

