

Dateiumwandlungen mit FFmpeg

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Weiterführender Memoriav-Workshop
Automatisierung von FFmpeg mit Bash
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Software

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Benutzerschnittstellen

- Lochkarten und Matrixdrucker
- Kommandozeile
(Englisch: command-line interface = CLI)
- grafische Benutzeroberfläche
(Englisch: graphical user interface = GUI)
- berührungslose Schnittstellen

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ASCII (1977/1986)

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|----|-----|
| 0x | NUL | SOH | STX | ETX | EOT | ENQ | ACK | BEL | BS | HT | LF | VT | FF | CR | SO | SI |
| 1x | DLE | DC1 | DC2 | DC3 | DC4 | NAK | SYN | ETB | CAN | EM | SUB | ESC | FS | GS | RS | US |
| 2x | SP | ! | " | # | \$ | % | & | ' | (|) | * | + | , | - | . | / |
| 3x | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | : | ; | < | = | > | ? |
| 4x | @ | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| 5x | P | Q | R | S | T | U | V | W | X | Y | Z | [| \ |] | ^ | _ |
| 6x | ` | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
| 7x | p | q | r | s | t | u | v | w | x | y | z | { | | } | ~ | DEL |

Changed or added in 1963 version
 Changed in both 1963 version and 1965 draft

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Die FFmpeg-Familie

Programme

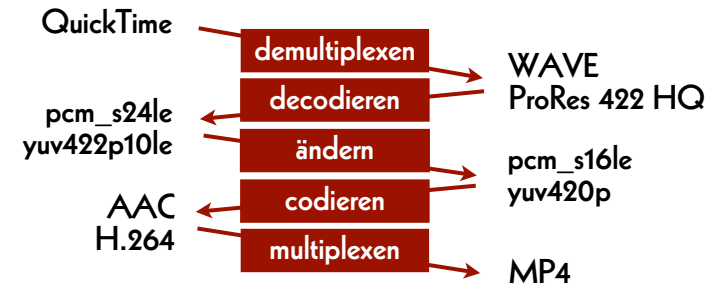
- ffmpeg
- ffprobe
- ffplay

Bibliotheken

- libavformat
- libavcodec
- libavfilter
- libavutil
- libavdevice
- libswscale
- libswresample
- libpostproc

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Beispiel: Bild und Ton



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Programmbibliotheken

demultiplexen: libavformat

decodieren: libavcodec

ändern: libavfilter

codieren: libavcodec

multiplexen: libavformat

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Dateiumwandlungen

ffmpeg (CLI)

→ ffmpeg.org

FFmpeg Cookbook for Archivists

→ avpres.net/FFmpeg/

ffmprovisr

→ amiaopensource.github.io/ffmprovisr/

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Metadaten extrahieren

MedialInfo (GUI), **mediainfo** (CLI)

→ mediaarea.net/MediaInfo

ffprobe (CLI)

→ ffmpeg.org

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Mediaplayer

VLC (GUI)

→ www.videolan.org/vlc/

mpv (CLI)

→ mpv.io

ffplay (CLI)

→ ffmpeg.org

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Grafische Benutzeroberfläche

FFCommand Engine (GUI)

→ github.com/ColorlabMD/FFCommand_Engine

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| | Vorteile | Nachteile |
|---------------------------------|------------------------------------|-------------------------------------|
| TIFF DPX OpenEXR | Daten leichter zu bearbeiten | grössere Dateien |
| JPEG 2000 FFV1 | kleinere Dateien | Daten komplexer zu bearbeiten |

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Einzelbild und Stream

RAWcooked (CLI)

→ mediaarea.net/RAWcooked

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RAWcooked

- encoding into Matroska (.mkv) using FFV1 video codec and FLAC audio codec
- all metadata preserved
- decoding with bit-by-bit reversibility
- possibility to embed sidecar files such as MD5, LUT, XML, PDF
- compatibility with media players

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Übungen

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FFmpeg-Syntax

```
ffmpeg [global_options]  
[input_options_n] -i input_file_n  
[output_options_n] output_file_n
```

```
ffplay [input_options] input_file
```

```
ffprobe [input_options] input_file
```

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Arbeitsfolder setzen

Linux/Mac/Windows Terminal oder WSL:

```
cd ~/Desktop
```

Windows lokal:

```
cd Desktop
```

Windows auf OneDrive Cloud:

```
cd OneDrive
```

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Befehlsstruktur

```
$0      $1              ${n}  
command argument_1 ... argument_n
```

Beispiele üblicher Syntaxen der Argumenten:

```
--parameter  
--parameter=value  
-p  
-p value
```

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Übungsfolder erzeugen

```
mkdir  
MEMORIAV
```

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Hilfe finden

```
ffmpeg -h encoder=tiff
```

```
ffplay -f lavfi -i testsrc
```

```
ffplay -f lavfi -i testsrc2
```

```
ffplay -f lavfi -i mandelbrot
```

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Bilddatei erzeugen

```
ffmpeg
```

```
-f lavfi -i "mandelbrot=size=2048x1536"
```

```
-pix_fmt rgb48le
```

```
-compression_algo 1
```

```
-t 10
```

```
MEMORIAV/mandelbrot_%06d.tif
```

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Bilddatei abspielen

```
ffplay
```

```
MEMORIAV/mandelbrot_%06d.tif
```

```
ffplay
```

```
-framerate 1
```

```
MEMORIAV/mandelbrot_%06d.tif
```

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Tondatei erzeugen

```
ffmpeg
```

```
-f lavfi -i "anoisesrc=color=brown"
```

```
-filter:a "tremolo=f=0.1:d=0.9"
```

```
-c:a pcm_s24le
```

```
-ar 48k
```

```
-ac 2
```

```
-t 10
```

```
seashore.wav
```

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Tondatei abspielen

```
ffplay  
seashore.wav
```

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Metadaten lesen

```
ffprobe  
-show_format  
-show_streams  
-print_format json  
seashore.wav
```

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Zugangsdatei

```
ffmpeg  
-f image2 -framerate 25  
-i MEMORIAV/mandelbrot_%06d.tif  
-i seashore.wav  
-filter:v "scale=640:480:flags=lanczos, hue=H=.5*t"  
-c:v libx264 -pix_fmt yuv420p  
-preset veryslow -crf 18  
-filter:a "loudnorm=I=-16:LRA=11:TP=-1.5"  
-c:a aac -ar 44100  
-movflags +faststart  
mandelsea_H264.mp4
```

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Zugangsdatei abspielen

```
ffplay  
mandelsea_H264.mp4
```

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Metadaten speichern

ffprobe

-show_format

-show_streams

-print_format **json**

mandelsea_H264.mp4

> *mandelsea_H264_mp4.txt*

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