

Making Videos

- Timelapse
 - `ffmpeg -framerate 60 -f image2 -s 4592x3064 -pattern_type glob -i 'flower_timelapse/*.JPG' -vcodec libx264 -pix_fmt yuv420p flower.mp4`
 - `ffmpeg -framerate 60 -pattern_type glob -i 'pictures/*.JPG' -c:v libx265 -crf 18 -preset ultrafast -vf "format=yuv420p" -tag:v hvc1 raw.mp4`
 - <https://gist.github.com/jkalucki/c81f8fe17599a8c9cd51b565d7dc27eb>
- Color Correction
 - Docs
 - <https://ffmpeg.org/ffmpeg-filters.html#eq>
 - To preview changes
 - `ffplay -vf eq=gamma=3.5:contrast=2 flower.mp4`
 - `ffplay -vf transpose=1,eq=brightness=0.5:contrast=2.5 flower.mp4`
 - To save changes
 - `ffmpeg -i flower.mp4 -vf transpose=1,eq=brightness=0.5:contrast=2.5 -c:a copy flower_color.mp4`
 - GIMP CURVES
 - Docs
 - <https://stackoverflow.com/questions/50333227/correcting-color-cast-with-ffmpeg>
 - <https://gist.github.com/carlosgeos/02c8a6bfb06b6495e539bb855ddfe507>
 - `ffmpeg -i input -vf "curves=psfile=color.acv" -c:a copy output`
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- Compress after everything
 - `ffmpeg -i flower_color.mp4 -vcodec libx264 -crf 24 flower_crf.mp4`
 - For x264 range is 0-51, here 0 is lossless, 23 is default, and 51 is worst possible. A lower value is a higher quality and a subjectively sane range is 18-28. Consider 18 to be visually lossless or nearly so
 - Recommended
 - `ffmpeg -i flower_color.mp4 -vcodec libx264 -crf 28 flower_crf_28.mp4`
 - `ffmpeg -i flower_crf_28.mp4 -vf "scale=iw/4:ih/4" flower_small.mp4`
- Optional
 - Cropping
 - <https://www.linuxuprising.com/2020/01/ffmpeg-how-to-crop-videos-with-examples.html>
 - `ffmpeg -i in.mp4 -filter:v "crop=out_w:out_h:x:y" out.mp4`
 - X,y corner, out_w, out_h is the width and height
 - Changing aspect ratio
 - `ffmpeg -i <INPUT_FILE> -aspect 720:540 -c copy [OUTPUT_FILE]`
 - `ffmpeg -i flower_crf.mp4 -aspect 3674:4592 -c copy flower_ar.mp4`
 - Scaling
 - `ffmpeg -i input.mkv -vf "scale=iw/2:ih/2" half_the_frame_size.mkv`
 - `ffmpeg -i input.mkv -vf "scale=iw/3:ih/3" a_third_the_frame_size.mkv`

- `ffmpeg -i input.mkv -vf "scale=iw/4:ih/4" a_fourth_the_frame_size.mkv`
 - Conver to black and white + normalization
 - `ffplay -vf transpose=1,hue=s=0 raw.mp4`
 - `ffplay -vf transpose=1,hue=s=0,normalize=blackpt=black:whitept=white:smoothing=50 raw.mp4`
- Videos
 - `ffmpeg -i 00153.MTS -c:a copy -c:v libx264 -preset slow -crf 18 -f mp4 movie.mp4`
 - `ffmpeg -i movie.mp4 -af "highpass=4000" -crf 18 af.mp4`
 - `ffmpeg -i movie.mp4 -vf "select=eq(n\,34)" -vframes 1 out.png`
 - `ffmpeg -i input.mkv -filter:v "setpts=2.0*PTS" output.mkv`
 - `ffmpeg -i camera.MP4 -r 60 -filter:v "setpts=0.5*PTS" fast.MP4`
 - `ffmpeg -i example.mkv -c copy example.mp4`
 - `ffmpeg -i turtle_timelapse.mkv -vcodec copy -acodec aac turtle_timelapse.mp4`
 - `ffmpeg -i in.mp4 -vf tpad=stop_mode=clone:stop_duration=2 out.mp4`
 - Clone last frame for 2 seconds
 - `ffmpeg -i input.mkv -filter_complex "[0:v]setpts=0.5*PTS[v];[0:a]atempo=2.0[a]" -map "[v]" -map "[a]" output.mkv`
 - Speed up 2x
 - `-filter "minterpolate='fps=120'"` will smooth
 - `ffmpeg -framerate 30 -pattern_type glob -i 'nighthawk_pics/*.png' -filter "minterpolate='fps=120'" -c:v libx265 -crf 18 -preset ultrafast -vf "format=yuv420p" -tag:v hvc1 nighthawk.mp4`
 - `ffmpeg -i video.mp4 -i audio.mp3 -c copy -map 0:v:0 -map 1:a:0 videoWithAudio.mp4`

GIFs

- Making
 - Docs
 - <https://engineering.giphy.com/how-to-make-gifs-with-ffmpeg/>
 - https://medium.com/@Peter_UXer/small-sized-and-beautiful-gifs-with-ffmpeg-25c5082ed733
 - Size is determined by
 - Framerate
 - Scale
 - colors
 - Basic (works badly)
 - `ffmpeg -i flower_color.mp4 -vf fps=90 -f gif flower.gif`
 - Lots of color pallets (works badly)
 - `ffmpeg -i flower_color.mp4 -filter_complex "[0:v] split [a][b];[a] palettegen [p];[b][p] paletteuse" flower_palette.gif`

- Single color palette (do this one!)
 - `ffmpeg -ss 0:10 -i flower_color.mp4 -vframes 1 palette.jpg`
 - `ffmpeg -i palette.jpg -vf paletten palette.png`
 - To test
 - `ffmpeg -i flower_color.mp4 -i palette.png -filter_complex "fps=15,scale=720:-1:flags=lanczos[x];[x][1:v]paletteuse" -t 1 flower.gif`
 - To run
 - `ffmpeg -i flower_color.mp4 -i palette.png -filter_complex "fps=10,scale=450:-1:flags=lanczos[x];[x][1:v]paletteuse" flower.gif`
 - Notes
 - Ss = start location min:seconds
 - -t 1 does 1 second
 - -crf
 - 18 and 24 — the lower, the higher the bitrate.
- Gif to mp4
 - `ffmpeg -i cvae_200_32x32.gif -movflags faststart -pix_fmt yuv420p cvae_200_32x32.mp4`
- Optimizing
 - Docs
 - <https://www.lcdf.org/gifsicle/man.html>
 - Basic
 - `gifsicle -O3 flower.gif -o flower_test.gif`
 - Reduce Colors
 - `gifsicle --colors=64 -O3 flower.gif -o flower_test.gif`
 - Select certain frames
 - `gifsicle --colors=16 flower.gif "#0-25" flower_test.gif`
- `ffmpeg -framerate 35 -f image2 -s 4592x3064 -pattern_type glob -i 'pictures/*.JPG' -vcodec libx264 -pix_fmt yuv420p raw.mp4`
- `ffmpeg -i raw.mp4 -filter:v "transpose=1,crop=2900:3712:392:440,rotate=-0.0001" cropped.mp4`
 - `ffplay -vf transpose=1,crop=2900:3712:392:440 raw.mp4`
 - `ffplay -vf transpose=1,crop=2924:3768:376:424,rotate=-0.0001 raw.mp4`
- `ffmpeg -i cropped.mp4 -vf eq=gamma=0.8:brightness=0.25:contrast=1.7 -c:a copy color_corrected.mp4`
 - `ffplay -vf hue=s=0,eq=gamma=0.8:brightness=0.25:contrast=1.7 cropped.mp4`
 - `ffplay -vf normalize=blackpt=black:whitept=white:smoothing=50 cropped.mp4`

- `ffplay -vf hue=s=0,eq=gamma=0.8:brightness=0.25:contrast=1.7,curves=increase_contrast cropped.mp4`
- `ffplay -vf hue=s=0,curves=strong_contrast,curves=lighter cropped.mp4`
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- `ffmpeg -i color_corrected.mp4 -vcodec libx264 -crf 28 compressed.mp4`
- `ffmpeg -i compressed.mp4 -vf "scale=iw/4:ih/4" out_small.mp4`
- `ffmpeg -ss 0:5 -i out_small.mp4 -vframes 1 palette.jpg`
- `ffmpeg -i palette.jpg -vf palettegen palette.png`
- `ffmpeg -i out_small.mp4 -i palette.png -filter_complex "fps=15,scale=450:-1:flags=lanczos[x];[x][1:v]paletteuse" cloth.gif`
- `gifsicle -O3 cloth.gif -o cloth_opt.gif`

Videos

- Getting them
 - `youtube-dl -o turtle_timelapse.mp4 "https://www.youtube.com/watch?v=oFA4wunH_5g"`
 - <https://github.com/yt-dl-org/youtube-dl/blob/master/README.md#output-template-examples>
 - `ffmpeg -i turtle_timelapse.mkv -vcodec copy -acodec aac turtle_timelapse.mp4`

`ffmpeg -framerate 30 -pattern_type glob -i 'photos/*.JPG' -c:v libx265 -crf 18 -preset ultrafast -vf "format=yuv420p" -tag:v hvc1 raw.mp4`

`ffmpeg -framerate 45 -pattern_type glob -i 'photos/*.JPG' -vcodec libx264 -crf 18 -preset ultrafast -vf "format=yuv420p" -tag:v hvc1 raw.mp4`

`ffmpeg -framerate 30 -f image2 -pattern_type glob -vcodec libx264 -pix_fmt yuv420p raw.mp4`

`ffmpeg -framerate 30 -pattern_type glob -i 'photos/*.JPG' -c:v libx264 -pix_fmt yuv420p raw.mp4`

`ffmpeg -i buddha_uncompressed.mov -vcodec libx264 -crf 24 buddha_rainbow.mp4`

