

Constrained Directional Enhancement Filter

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Directional Deringing Filter

- Operates on 8x8 blocks
 - Estimates direction (luma only)
 - Conditional replacement filter
 - First along directions
 - Second across directions
- Global frame-level strength (quality-dependent)
- Superblock (64x64) strength adjustment
 - Four possible values (including “off”)

CDEF Proposal

- Merging the directional deringing filter and the constrained lowpass filter into a single filter
- CLPF replaces second (“orthogonal”) conditional replacement filter in dering
- Resulting complexity is similar to dering
- Results exceed both dering and clpf alone, as well as the original dering+clpf combination
- Signalling 64x64 blocks, 1 to 8 possible strengths

Results

- AreWeCompressedYet, objective-1-fast
- Real-time and non-real-time configurations
 - Better results for real-time (no B frames)
 - Better results as complexity goes down

Bitrate (bpp)	PSNR	CIEDE 2000	PSNR-HVS	SSIM	MS-SSIM
High-latency	-2.07%	-2.02%	-0.74%	-1.63%	-0.90%
Low-latency	-3.92%	-3.67%	-2.44%	-3.42%	-2.58%
Low-latency, cpu-used=4	-7.58%	-7.40%	-5.41%	-7.87%	-6.09%

Complexity

- Encoder complexity $<1\%$
- Decoder complexity $\sim 12\%$
 - Still more optimizations to make
- Hardware line buffer: 6 lines
- Two search strategies
 - Whole-frame optimization
 - Heuristic-driven 64×64 decisions

TODO

- Perceptual distortion metric
- Entropy coding strengths
- Optimize interaction with other tools

CDEF Disabled



CDEF Enabled

