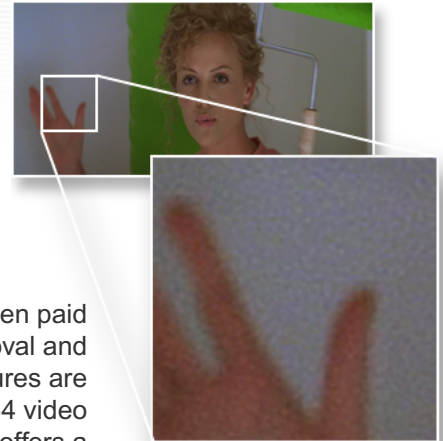


YUV Grain-Degrain Technology

Intelligent removal and application of video film grain noise

Video digitized from film has a peculiar noise known as film grain noise. Although this type of noise makes digital video less compressible, artificial or reconstructed film grain noise can improve visual quality, make video livelier and make compression artifacts less noticeable.



Considerable attention has been paid recently to film grain noise removal and reconstruction, and these features are currently included in the H.264 video coding specification. YUVsoft offers a complete degrain-regrain technology.

Primary Applications

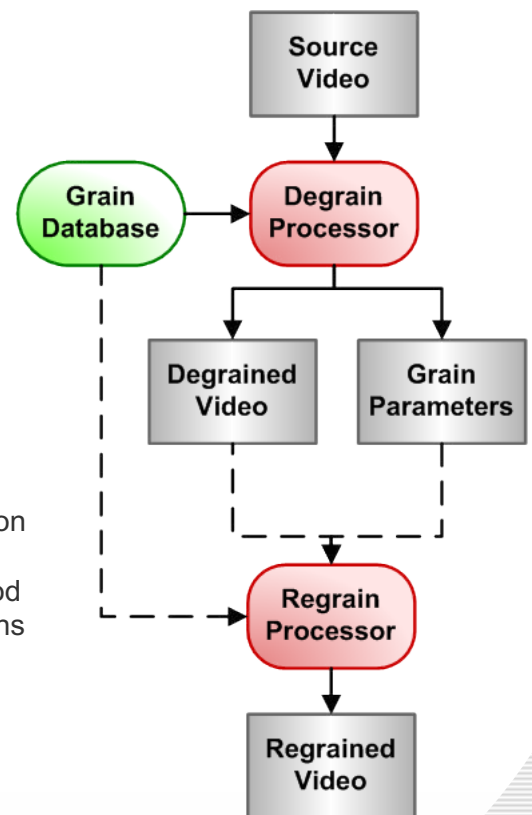
- DVD and HD DVD recorders
- Video CD/DVD/DivX players
- Digital camcorders
- Television equipment
- Stream pre-processing for better quality/compression ratio trade-off
- Professional video remastering
- Home video processing

Key Features

- One-pass real-time processing
- Several methods, with various trade-offs, for grain noise removal
- Several approaches to grain reconstruction (generation) including analytical models and a film grain samples database method
- Optional application of grain noise patterns extracted from any video
- Applicable both to video and to static

Basic Deliverables

- Source code for a reference implementation in C
- C and assembly language source code for an implementation optimized for the PC (if required)
- Algorithm description
- Software description
- Verification instructions



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Specification

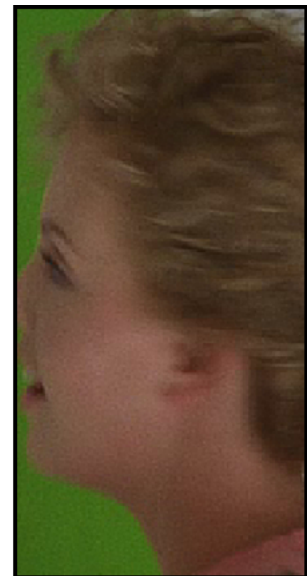
- Adjustable speed/quality trade-off
- Motion compensation
- Integer arithmetic
- Memory usage of approximately 50 bytes per pixel for degrain and 1 byte per pixel for regrain
- Fully sequential processing
- Performance of non-optimized C reference model is 10-40 fps for degrain and 50 fps for regrain for standard definition video on an Intel Pentium 4 2.8 GHz PC
- Ample potential for parallelization



Source Frame



Degrained Frame



Regrained Frame