

# DR Wavelet Lib

Video compression and decompression library for TriMedia and PC

DRResearch  
Digital Media Systems GmbH

Otto-Schmirgal-Str. 3 · D-10319 Berlin  
Phone: +49 (030) - 515 932 - 0  
Fax: +49 (030) - 515 932 - 299  
e-mail [contact@dresearch.de](mailto:contact@dresearch.de)  
<http://www.dresearch.de>

Managing Director Dr. Michael Weber  
County court Berlin-Charlottenburg · HRB-Nr. 54412  
Accounting details:  
Dresdner Bank AG  
Bank code number: 120 800 00  
Account number: 40 472 475 00



Original, 1,2 MByte



Wavelet, 1:237, 5KByte

## Features

- multiple instances possible
- well suited for fixed cameras
- adjustable compression rate (The size of the compressed pictures is adjustable on a per byte base.)
- easy to use buffer interface
- optimized algorithms for:
  - small bandwidth (GSM using 9600 bit/s)
  - medium bandwidth (2 ISDN channels, 128 Kbit/s)

## Input

Frames: YUV 4:1:1 or greyscale format.

Input formats:

QCIF	176 x 144
CIF	352 x 288
odd fields only (CCIR_601)	704 x 288 .
both fields (CCIR_601)	704 x 576 .

(Odd and Both fields only on TriMedia Boards with at least 16 MB main memory)

## Algorithm

- uses spatial and temporal redundancies between adjacent frames for data reduction.
- performs a multilevel wavelet transformation
- employs dependencies within a video sequence
- codes the transformed frame using a specifically adapted algorithm
- sorts the data of the resulting bitstream accordingly to its contribution to the frame

## System requirements

- TriMedia or
- PC Windows 32, at least Pentium 133

## Output

The length of the resulting bitstream may be defined by the user. Thus the size of the compressed frame and its resolution may be suited optimally.

## Application

- video transmission on a connection with limited bandwidth
- compact storage of video sequences and still images

## Wavelet video compression



QCIF resolution (176x144), 600 bytes/frame, 2 frames/sec

*Benefits of wavelet based compression to block oriented techniques (e.g. JPEG)*

- no block artefacts at high compression rates
- easily achievable constant frame rate through adjustable compression rate
- preview capabilities as an inherent feature of the wavelet algorithm

*Comparison of wavelet and JPEG compression*



JPEG, 1:150, 6 Kbytes

Wavelet, 1:150, 6 Kbytes

Wavelet, 1:25, 36 Kbytes

original, 900 Kbytes, 640x512

*Compression speed - algorithm for low bandwidth*

	compression speed	compression speed
Size of the compressed frames	Pentium III/450	Philips TriMedia TM1100
600 Byte	70,0 QCIF frames/s or 22,5 CIF frames/s	51,5 QCIF frames/s or 16,35 CIF frames/s
1000 Byte	67,0 QCIF frames/s or 17,0 CIF frames/s	46,6 QCIF frames/s or 15,84 CIF frames/s

*Compression speed - algorithm for medium bandwidth*

	compression speed	compression speed
Size of the compressed frames	Pentium III/450	Philips TriMedia TM1100
5 KByte	43,0 QCIF frames/s or 16,5 CIF frames/s or 10,2 single fields	23,7 QCIF frames/s or 12,0 CIF frames/s or 7,24 single fields
15 KByte	22,0 QCIF frames/s or 11,0 CIF frames/s or 8,3 single fields/s	10,5 QCIF frames/s or 7,4 CIF frames/s or 5,2 single fields/s