VLIB 2.0: Video Analytics & Vision Library

Texas Instruments

VLIB 2.0 supports:

- **V**ideo Analytics
- Automotive **V**ision & Advanced Driver Assistance Systems (**ADAS**)
- Embedded **V**ision
- Game **V**ision
- Machine **V**ision
- Consumer electronics **V**ision

VLIB 2.0 consists of 50+ royalty-free kernels:

- Background modeling & subtraction
- Object feature extraction
- Tracking, recognition
- Low-level pixel processing

VLIB 2.0 available now, royalty-free

New in VLIB 2.0:

- Optimized functions for **C64x** DaVinci™ DSP core support (example: DM642)
- **Simulink** blocks to enable MathWorks model-based design
- Bit-exact version for testing on PC
- 6 additional functions including Bit mask packing/unpacking, 16-bit IIR filter, L1 distance

VLIB 2.0 Function List

- Background subtraction
  - Exponentially and uniformly weighted mean
  - Exponentially and uniformly weighted variance
  - Mixture of Gaussians
- Canny edge detection
  - Non-maxima suppression
- Hough transform for lines
- Integral image
- Image pyramid
- Legendre moments

Texas Instruments
TMS320C64x™ DSP Vision Library

VLIB off:
utilizing 14.5% total processing power, 86 MHz

VLIB on:
utilizing 1.6% total processing power, 9 MHz

MOS	DSP 86.06 MHZ	VIDEO 320x240	FORMAT
VLIB OFF	LOAD 14.5 %		10 FPS

VLIB FUNCTION NAME		Cyc/Pix	AvgMHz
VLIB_ConvertUYUVtoLuma	=	1.19	0.92
VLIB_subtractBackgroundS16	=	16.21	12.43
VLIB_erode_bin_square	=	22.88	17.54
VLIB_dilate_bin_square	=	22.24	17.07
VLIB_updateEWRMeanS16	=	17.13	13.18
VLIB_updateEWRVarianceS16	=	23.20	17.81
VLIB_CreateCCList	=	3.77	2.85
VLIB_CreateCCMap8	=	0.00	0.00
Overhead (framework, etc.)	=	6.02	4.52
MOS TOTAL (Running-Avg)	=	112.64	86.32

MOS	DSP 9.31 MHZ	VIDEO 320x240	FORMAT
VLIB ON	LOAD 1.6 %		10 FPS

VLIB FUNCTION NAME		Cyc/Pix	AvgMHz
VLIB_ConvertUYUVtoLuma	=	0.38	0.30
VLIB_subtractBackgroundS16	=	1.32	1.01
VLIB_erode_bin_square	=	0.20	0.16
VLIB_dilate_bin_square	=	0.20	0.16
VLIB_updateEWRMeanS16	=	1.16	0.90
VLIB_updateEWRVarianceS16	=	1.37	1.05
VLIB_CreateCCList	=	1.80	1.38
VLIB_CreateCCMap8	=	0.00	0.00
Overhead (framework, etc.)	=	6.02	4.62
MOS TOTAL (Running-Avg)	=	12.45	9.58

Example application of VLIB providing ~10X pixel processing improvement over standard C code

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Getting started with VLIB is as easy as one, two, three . . .

Step 1: A C64x+ or C64x based development tool is required to view and access the VLIB software. If needed, TI recommends the TMS320DM6437 Digital Video Development Platform (Part number TMDSVDP6437, $495).

Step 2: Get approval from TI. Visit www.ti.com/vlibrequest to fill out VLIB Approval Request form.

Step 3: Upon approval, download VLIB at no cost and receive:

- Library of 50+ kernel library and header files
- Simulink blocks
- PC library
- Documentation: User's Guide
- Demo (for use on TMS320DM6437 DVDP only)
- Test scripts

TEXAS INSTRUMENTS

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