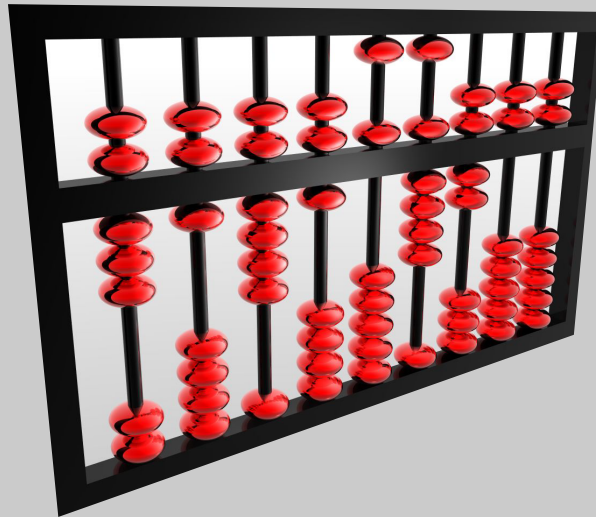


NASoftware

VSIPL Library

Fast vector and matrix Signal Processing



VSIPL

VSIPL (see www.vsipl.org) provides a standard API for a wide range of vector, signal processing, and image processing functions, while hiding implementation details from the user. Using a VSIPL-conformant library ensures portability across implementations and helps future-proof your application codes.

VSIPL specifies both **performance** and **development** modes; the development mode debug information helps track bugs fast.

The **NAS VSIPL** library is highly optimised for the target processor and takes full advantage of the processor's SIMD features (AltiVec or SSE). Typically it provides factors of six to eight speedups compared with non-SIMD implementations.

On multicore and shared memory systems (including Intel and MIPS) the library is multi-threaded, automatically providing scaleable performance for larger problems.

Functionality

The **VSIPL** library covers the functionality specified in the Full VSIPL standard (see <http://www.vsipl.org/documents>); a total of 979 functions in all.

The range of functions supported includes: -

- FFT and convolution
- windowing and filter operations (eg moving average)
- vector math functions (eg sin, cos)
- elementwise matrix operations (eg matrix add)
- elementwise vector operations (eg vector add)
- scatter-gather operations (eg dot product)
- matrix operations (eg transpose)
- matrix-vector operations (eg matrix-vector product, GEMV)
- matrix-matrix operations (eg matrix-matrix product, GEMM)
- Linear Algebra (solution of equations, matrix decomposition)

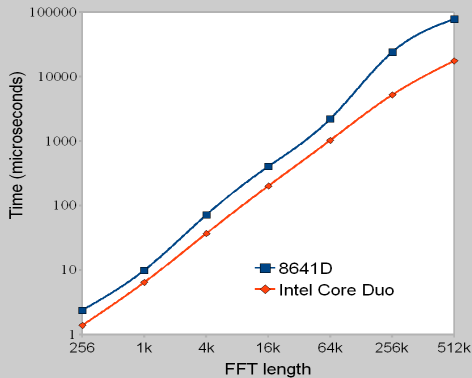
Efficiency

Every (non-scalar) routine in the library has been specifically optimised for the target Processor.

The graph below compares the performance of the routine: complex-complex FFT (length N)

8641D: 1GHz PowerPC, 400MHz Front Side Bus

Intel Core Duo: Merom, 2.16GHz, 667MHz Front Side Bus



Implementations

PowerPC/G4 Linux
 PowerPC VXWorks
 Intel SSE2/4 Linux
 Intel SSE2/4 VXWorks
 Intel SSE2/4 Windows XP/Vista
 MIPS64 Linux*

*Contact DRS Signal Solutions,
 +1 301 948 7550 for this version

If you need libraries for other processors or operating systems, ring or email us.

About NAS

N.A. Software Ltd (NAS) has provided consultancy, optimised libraries and other software tools to the High Performance Computing and DSP markets for over thirty years. Ring us to discuss your requirements on +44 151 609 1911

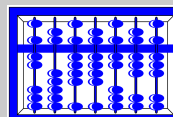


The 994 routines available in the library are shown below:

Algorithm Area	No.
Initialise/finalise	2
Array and Block Object Functions	65
Vector View Object Functions	165
Matrix View Object Functions	185
Real Scalar Functions	18
Complex Scalar Functions	18
Index Scalar Functions	3
Random Number Generation	10
Elementary Math Functions	37
Unary Operations	63
Binary Operations	91
Ternary Operations	16
Logical Operations	31
Selection Operations	19
Bitwise and Boolean Logical Operators	24
Element Generation and Copy	41
Manipulation operations	32
FFT Functions	30
Convolution/Correlation Functions	24
Window Functions	4
Filter Functions	10
Miscellaneous Signal Processing Functions	1
Matrix and Vector Operations	47
Special Linear System Solvers	6
General Square Linear System Solver	10
Symmetric Positive Definite Linear System Solver	10
Over-determined Linear System Solver	14
Service Routines	18

Further Information

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