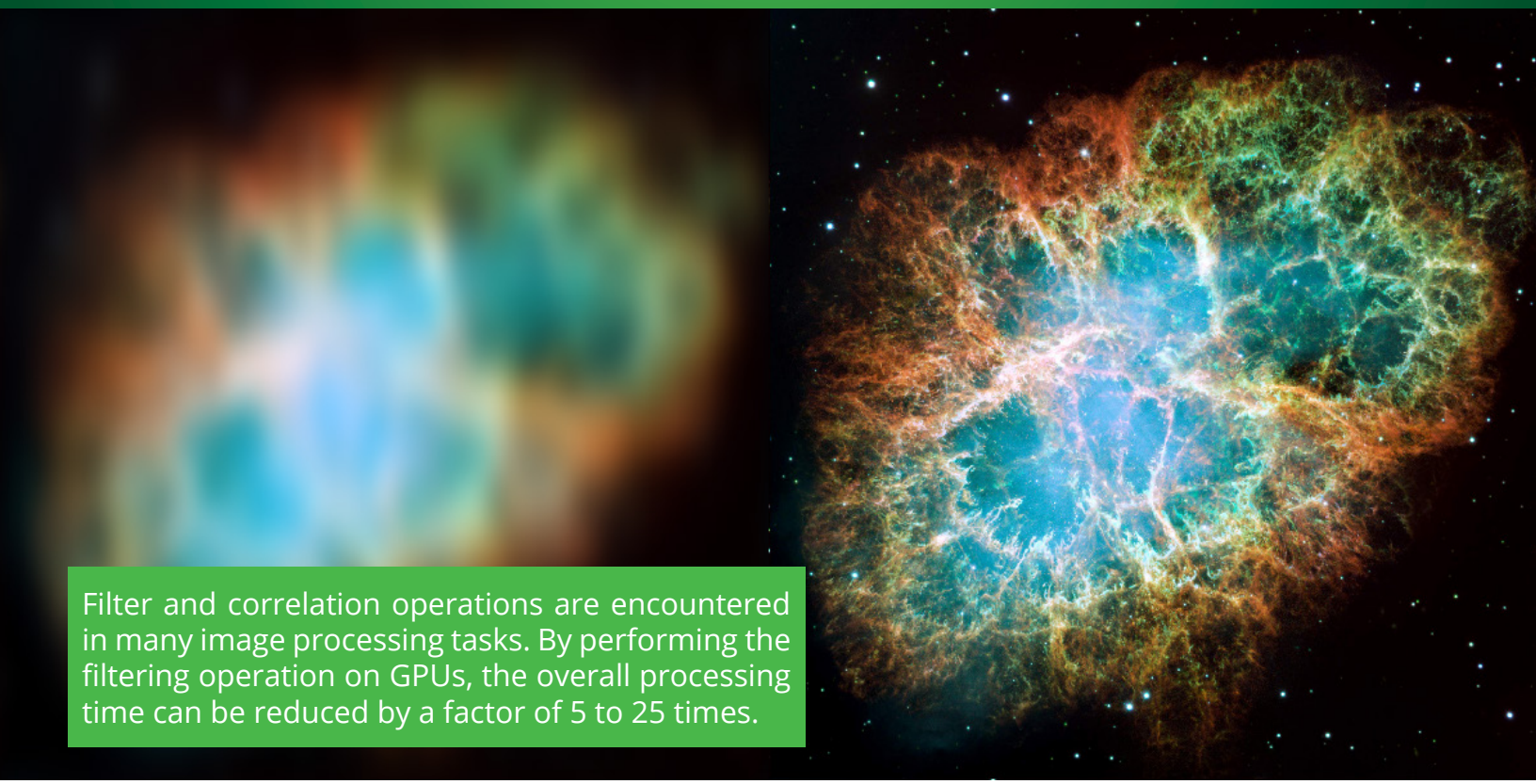
GPULib

TECH-X
SIMULATIONS EMPOWERING YOUR INNOVATIONS

GPU-Accelerated Computing for IDL

- Fast
- Powerful
- Easy-to-use



Filter and correlation operations are encountered in many image processing tasks. By performing the filtering operation on GPUs, the overall processing time can be reduced by a factor of 5 to 25 times.

Application Acceleration

By providing bindings for IDL, Tech-X's GPULib can accelerate new applications or be incorporated in existing applications with minimal effort. No knowledge of GPU programming or memory management is required.

Advantages

- Speed up IDL code easily.
- Fully documented API with examples.
- Utilize your existing CUDA-enabled GPUs.
- Easy installation on Windows, Mac OS X, and Linux.

Performance Results

Speed increase due to GPULib over standard IDL library routines

Algorithm or Demo	Speedup
FFT (250x250 - 10,000x10,000)	10-60
decon_hubble demo (FFT-based deconvolution)	7.7
LGamma demo (1e6 element arrays)	22.8
FDTD demo	25

Hardware: NVIDIA® Tesla® C2070 vs. Intel® Xeon® CPU X5650 (2.67 GHz). (All 12 Xeon cores were used in performance test).

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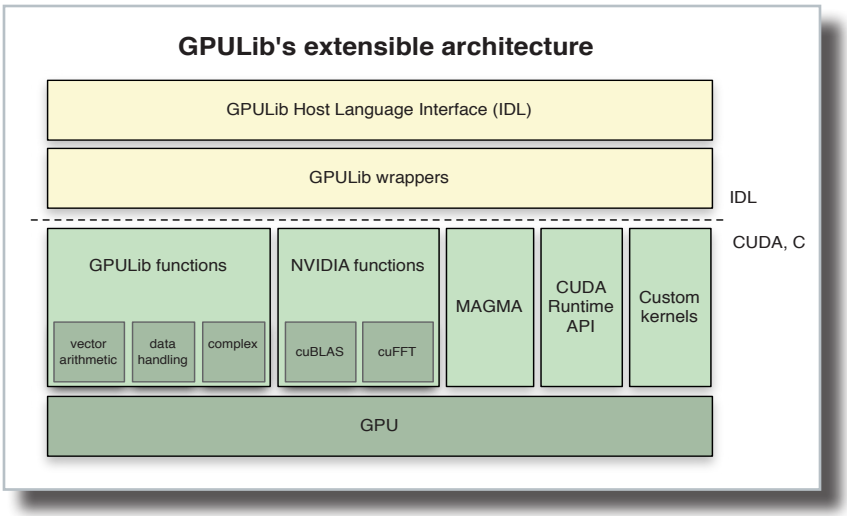
GPULib

Features	
1D, 2D, and 3D FFTs	
Batched FFTs	
MAGMA linear algebra routines:	■ GPU accelerated LAPACK library
Load and execute custom CUDA code	
Basic vector operations	
BLAS operations	
Random number generator	
Support for CUDA 5.5	
Optimized scalar/array operations	
Common IDL routines, including:	■ HISTOGRAM ■ WHERE
Complex data support for:	■ GPUATAN2 for complex and double complex ■ GPUREAL
Special functions like LGAMMA	
Accelerated special purpose image processing operations, including Radon transform	
Array indexing and efficient subarray operations	
Makes use of IDL 8.0 and later overloaded operators for simple notation	
Use of streams to hide memory transfer times	
Memory transfer/allocation	
Defaults to CPU when CUDA-enabled hardware not present	



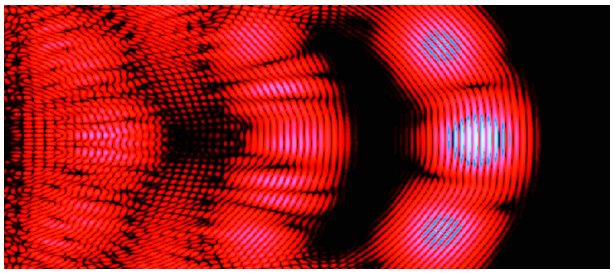
Bulk licensing discounts and redistribution license pricing are available.

Consulting Services

Tech-X offers consulting and training services in addition to the free support that comes with every purchase of GPULib. We have Tech-X experts available for consulting to help you use GPULib to its fullest possible extent to solve your most challenging problems.

About Tech-X Corporation

Tech-X Corporation is committed to technical excellence and innovation. Our scientists and software engineers work together to deliver quantifiable results. We combine academic research with a commercial software company sensibility to deliver high-quality, cutting-edge software that takes advantage of the latest hardware and software advances.



Finite-difference time-domain (FDTD) simulations are widely used for the time dependent behavior of electromagnetic fields. By using GPUs, these computations can be accelerated by 25 times or more.

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