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PV-4D LIBSTREAM – WORLD RECORDS FOR CPU BASED STREAMING CODES

PV-4D Libstream is a collection of micro kernels for current and next generation manycore CPU architectures. It is an essential building block for scalable parallel algorithms and applications on today's SMP systems.

Each functional logic is highly optimized and performs at the cutting edge of the hardware. This enables PV-4D Libstream to work at a new level of performance that is a magnitude higher than ever reported on CPUs and GPUs while still providing a simple and user-friendly API

Functional units

- sorting

- prefix scans

- geometry compiler (BVH, KDTree)

- delaunay triangulation

- marching cube

- concurrent vectors and queues (lock free)

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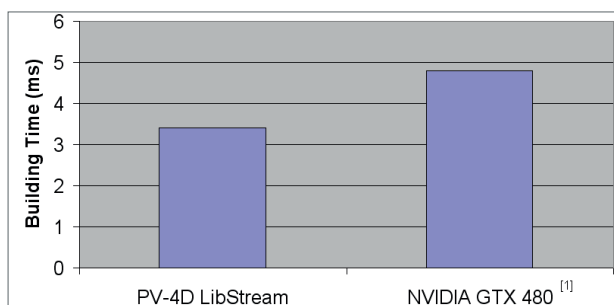Phone +49 631 31600-44 59
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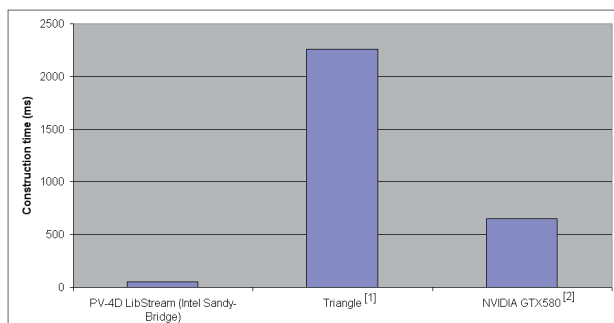lojewski@itwm.fraunhofer.de

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BVH Construction:
**Scene Fairy (174 k triangles)**

"Simpler and Faster HLBVH with Work Queues"
K. Garanzha et al.: High Performance Graphics, August 2011

2D Delaunay Triangulation
(2 M random points)

[1] Delaunay refinement algorithms for triangular mesh generation
J. R. Shewchuk, Computational Geometry, May 2002

[2] Meng Qi et al.: Computing 2d constrained delaunay triangulation using GPU
I3D'12 Proceedings of the ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games
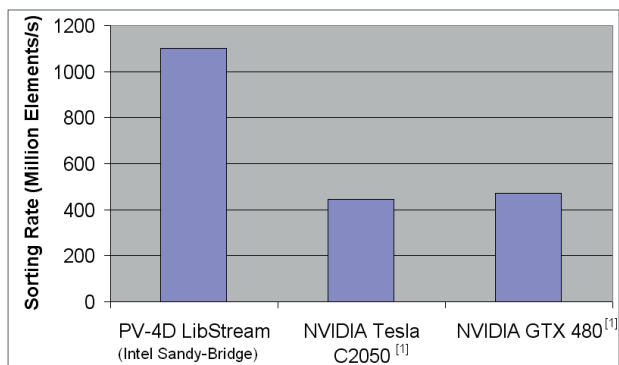
Sorting 32 Bit Keys

[1] Merril et al.: Revisiting Sorting for GPGPU Stream Architectures
PACT'10 Proceedings of the 19th international conference on Parallel architectures and compilation techniques, pages 545-546