



# ПРИЛОЖЕНИЯ С GPU УСКОРЕНИЕМ



# ПРИЛОЖЕНИЯ С GPU УСКОРЕНИЕМ

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# Экономические и финансовые вычисления

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Aaon Benfield Pathwise™</b>	Specialized platform for real-time hedging, valuation, pricing and risk management	Spreadsheet-like modeling interfaces, Python-based scripting environment and Grid middleware	Yes
<b>Altimesh's Hybridizer C#</b>	Multi-target C# framework for data parallel computing.	C# with translation to GPU or Multi-Core Xeon	Yes
<b>Elsen Accelerated Computing Engine (TM)</b>	Secure, accessible, and accelerated back-testing, scenario analysis, risk analytics and real-time trading designed for easy integration and rapid development.	Web-like API with Native bindings for Python, R, Scala, C. Custom models and data streams are easy to add.	Yes
<b>Global Valuation Esther</b>	In-memory risk analytics system for OTC portfolios with a particular focus on XVA metrics and balance sheet simulations.	High quality models not admitting closed form solutions, efficient solvers based on full matrix linear algebra powered by GPUs and Monte Carlo algorithms.	Yes
<b>Hanweck Associates</b>	Real-time options analytical engine (Volera)	Real-time options analytics engine	Yes
<b>MiAccLib 2.0.1</b>	Accelerated libraries which encompasses high speed multi-algorithm search engines, data security engine and also video analytics engines for text processing, encryption/ decryption and video surveillance respectively.	Text Processing : Exact Match, Approximate\Similarity Text, Wild Card, MultiKeyword and MultiColumnMultiKeyword, etc Data Security: Accelerated Encryption/Description for AES-128 Vide Analytics: Accelerated Intrusion Detection Algorithm	Yes
<b>MISYS Global Risk</b>	Regulatory compliance and enterprise wide risk transparency package	Risk analytics	Yes
<b>Murex MACS Analytics Library</b>	Analytics library for modeling valuation and risk for derivatives across multiple asset classes.	Market standard models for all asset classes paired with the most efficient resolution methods (Monte Carlo simulations and Partial Differential Equations)	Yes
<b>Numerical Algorithms Group (NAG)</b>	Random number generators, Brownian bridges, and PDE solvers	Monte Carlo and PDE solvers	Single only
<b>QuantAlea's Alea.cuBase F#</b>	F# package enabling a growing set of F# capability to run on a GPU.	F# for GPU accelerators	Yes
<b>RMS</b>	Catastrophic risk modeling for FSI (earthquakes, hurricanes, terrorism, infectious diseases)	Risk analytics	Yes
<b>SciComp, Inc</b>	Derivative pricing (SciFinance)	Monte Carlo and PDE pricing models	Single only
<b>SunGard- Adaptiv Analytics</b>	A flexible and extensible engine for fast calculations of a wide variety of pricing and risk measures on a broad range of asset classes and derivatives	Existing models code in C# supported transparently, with minimal code changes, Supports multiple backends including CUDA and OpenCL, Switches transparently between multiple GPUs and CPUS depending on the deal support and load factors	Yes
<b>Synerscope- Synerscope Data Visualization</b>	Visual big data exploration and insight tools	Graphical exploration of large network datasets including geo-spatial and temporal components	Single only
<b>Tanay ZX Lib (Fuzzy Logic)</b>	Financial analytics and data mining library	Monte Carlo simulations, pricing of vanilla and exotic options, fixed income analytics, data mining	Yes
<b>Xcelerit SDK</b>	Software Development Kit (SDK) to boost the performance of Financial applications (e.g. Monte-Carlo, Finite-difference) with minimum changes to existing code	C++ programming language, cross-platform (back-end generates CUDA and optimized CPU code), supports Windows and Linux operating systems.	Yes

## Анализ данных

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>BIDMach - UC Berkeley</b>	Fastest Big Data tools on the web. Holds the records for many common machine learning problems, on single nodes or clusters. Interactive environment for easily building and deploying machine learning models.	Scala interface. Supports: Linear regression Logistic regression SVM LDA K-Means ...and other operations.	Yes
<b>GPUdb</b>	A distributed database for many core devices. GPUdb is a scalable, distributed database with SQL-style query capability for Big Data. Full suite of geospatial calculation capability.	Query against Big Data in real time. No pre-indexing allows for complex, ad-hoc query chains. Interactively explore large, streaming data sets.	Yes
<b>Systap - MapGraph HPC</b>	GPU Accelerated Gather-Appl-Scatter API for high-performance graph mining and traversal operations. The GAS abstraction is Graph-parallel and provides orders of magnitude speedups over Data-parallel frameworks like map/reduce. Runs on clusters of GPUs to process the largest graphs in near real time. Can traverse a scale-free graph with 32 GTEPS of performance.	Vertex-centric, Java API Supports: Breadth-First Search (BFS) Single-Source Shortest Path (SSSP) Page Rank ... and other operations.	Yes

## Оборона и разведка

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Comprimato JPEG2000 Codec</b>	A high performing, GPU powered, JPEG2000 encoder and decoder SDK which can be integrated into almost any application.	Very large image processing, specific area decoding, multi resolution/quality decoding supporting all GEOSPATIAL image formats. (eg NITF, BIIF). Mobile and embedded platform friendly.	Yes
<b>DigitalGlobe - Advanced Ortho Series</b>	Geospatial Visualization	Image orthorectification	Yes
<b>Elcomsoft</b>	High-performance distributed password recovery software with NVIDIA GPU acceleration and scalability to over 10,000 workstations.	GPU acceleration for password recovery, 10-100x speedup for password recovery	Yes
<b>Eternix - Blaze Terra</b>	Geospatial Visualization	3D visualization of geospatial data	Yes
<b>Exelis (ITT) ENVI</b>	Geospatial Visualization	Image orthorectification, Image transformation, atmospheric correction	Yes
<b>GeoWeb3d Desktop</b>	Geospatial Visualization	3D visualization of geospatial data	Yes
<b>GPUdb</b>	Multi-GPU, Multi-Machine distributed object store providing SQL style query capability, advanced geospatial query capability, heatmap generation, and distributed rasterization services	Query against Big Data in real time. No pre-indexing allows for complex, ad-hoc query chains. Interactively explore large, streaming data sets.	Yes
<b>Intergraph Motion Video Analyst</b>	Video filters and mosaic'ing - Geo-fuses FMV analytics with intelligence data	Full motion video ortho mosaic processing, de-hazing algorithms	Single only
<b>Intuvision Panoptes 3.0</b>	Video Analytics	Object recognition and change detection	Yes
<b>LuciadLightspeed</b>	Geospatial Visualization and Analysis	Geospatial Situational Awareness	Single only
<b>Manifold Systems</b>	Full-featured GIS, vector/raster processing & analysis	Manifold Surface Tools	Yes



<b>MotionDSP - Ikena ISR</b>	Real-time Full Motion Video and WAMI enhancement and analytics	Real-time super-resolution-based video enhancement, filtering, mosaicing, video analytics, and transcoding	Yes
<b>NerVve Visual Search Solution (NVSS)</b>	Video/Image Live and Forensic Search	Video and Image content search	Yes
<b>OpCoast SNEAK</b>	Electromagnetic signals propagation modeling for complex urban and terrain environments	Ray tracing, DTED and remote sensing inputs	Yes
<b>PCI Geomatics GXL</b>	Image Processing	Image orthorectification and additional image processing	Yes
<b>Skyline Software - Terrabuilder PhotoMesh</b>	PhotoMesh integrates a GPU-based, fast algorithm, able to automatically build 3D models from simple photographs. PhotoMesh revolutionizes the use of geospatial data by fully automating the generation of high-resolution, textured, 3D mesh models from standard 2D images	3D model building from imagery; building texture generation	Yes
<b>SocetGXP – BAE Systems</b>	The Automatic Spatial Modeler (ASM) is designed to generate 3-D point clouds with accuracy similar to LiDAR, which can extract 3-D objects from stereo images. ASM can extract dense 3-D point clouds from stereo images, and extract accurate building edges and corners from stereo images with high resolution, large overlaps, and high dynamic range.	Automated 3D feature extraction	Yes
<b>SynerScope</b>	Big data visualization and data discovery, for combining Analytics on Analytics with IoT compute-at-the-edge smart sensors	Real-time Interaction with data	No

## Машинное обучение

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Caffe</b>	The Caffe deep learning framework makes implementing state-of-the-art deep learning easy.	Process over 40M images per day with a single NVIDIA K40 or Titan GPU	Single only
<b>Theano</b>	Theano is a symbolic expression compiler that powers large-scale computationally intensive scientific investigations.	Abstract expression graphs for transparent GPU acceleration	Single only
<b>Torch7</b>	Torch7 is an interactive development environment for machine learning and computer vision.	Computational back-ends for multicore GPUs	Single only
<b>Trakomatic OSense, Otrack</b>	Video Analytics Solution for Retail, Supermarkets, Shopping Mall and Banking 5-25x Speed up on GPU	<ul style="list-style-type: none"> <li>• People Detection &amp; Tracking</li> <li>• Crowd Density Estimation</li> <li>• Gender Classification and Age Estimation</li> <li>• Person Re-identification</li> </ul>	Yes

## Вычислительные решения для промышленности

### ВЫЧИСЛИТЕЛЬНАЯ ГИДРОДИНАМИКА

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Altair AcuSolve</b>	General purpose CFD software	Linear equation solver	Yes
<b>ANSYS - Fluent</b>	General purpose CFD software	Radiation heat transfer model, linear equation solver	Yes
<b>Autodesk - Moldflow</b>	Plastic mold injection software	Linear equation solver	Single only
<b>CPFD Barracuda-VR and Barracuda</b>	Fluidized bed modeling software	Linear equation solver, particle calculations	Single only

<b>DHI - MIKE 21</b>	2D hydrological modelling of coast and sea	Hydrodynamics; Advection-dispersion; Sand and mud transport; coupled modelling; particle tracking; oil spill; ecological modelling; agent based modelling; various wave models	Yes
<b>DHI - MIKE FLOOD</b>	1D & 2D urban, coastal, and riverine flood modelling	Hydrodynamics	Yes
<b>FluiDyna aeroFluidX</b>	Incompressible single-phase CFD software	Finite volume solver	Yes
<b>FluiDyna - Culises for OpenFOAM</b>	Solver library for general purpose CFD software	Linear equation solvers	Yes
<b>FluiDyna nanoFluidX</b>	General purpose CFD software	SPH solver	Yes
<b>FluiDyna ultraFluidX</b>	General purpose CFD software	Lattice-Boltzmann solver	Yes
<b>midas NFX(CFD)</b>	General purpose CFD software based on FEM	Linear equation solver(Iterative Solver and AMG Preconditioner)	Single only
<b>Prometech - Particleworks</b>	Particle-based CFD software	Implicit and explicit solvers	Yes
<b>Turbostream Ltd.</b>	CFD software for turbomachinery flows	Explicit solver	Yes
<b>Vratis Speed IT FLOW</b>	Incompressible single-phase CFD software	Finite volume solver	Single only
<b>Vratis SpeedIT for OpenFOAM</b>	Solver library for general purpose CFD software	Linear equation solvers	Yes

## Исследования в области вычислительной гидродинамики

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>DualSPHysics</b>	SPH-based CFD software	SPH model	Yes
<b>FEFLO (GMU-Lohner)</b>	General purpose CFD software for compressible and incompressible flows	Implicit and explicit solver	Yes
<b>GIN3D (Senocak – Boise St)</b>	General purpose CFD software for incompressible flows.	Implicit solver	Yes
<b>HiFiLES (Stanford-Jameson)</b>	General purpose CFD software for compressible flows.	Explicit solver	Yes
<b>HiPSTAR (Sandberg – University of Southampton)</b>	CFD software for compressible reacting flows.	Explicit solver	Yes
<b>JENRE, Propel (NRL)</b>	CFD software for compressible flows.	Explicit solver	Yes
<b>NASA FUN3D</b>	General purpose CFD software	Linear equation solver	Single only
<b>PyFR (Vincent – Imperial College)</b>	General purpose CFD software for compressible flows.	High-order FR solver	Yes
<b>S3D (Sandia and Oak Ridge NL)</b>	Direct numerical solver (DNS) for turbulent combustion	Chemistry model	Yes

## МЕХАНИКА ТВЕРДОГО ТЕЛА, ПРОЧНОСТНЫЕ РАСЧЕТЫ

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Altair OptiStruct</b>	Industry proven, modern structural analysis solver and solution for structural design and optimization	Direct and iterative solvers	Yes
<b>Altair RADIOSS Implicit</b>	Simulation and analysis tool for structural mechanics	Direct and iterative solvers	Yes
<b>ANSYS - Mechanical</b>	Simulation and analysis tool for structural mechanics	Direct and iterative solvers	Yes
<b>Dassault Systèmes SIMULIA Abaqus/Standard</b>	Simulation and analysis tool for structural mechanics	Direct sparse solver	Yes
<b>Dassault Systèmes SIMULIA 3DEXPERIENCE</b>	Realistic simulation solution (Uses Abaqus Standard for GPU computing)	Direct sparse solver	Single only

<b>Impetus Afea</b>	Predicts large deformations of structures and components exposed to extreme loading conditions	Linear equation solver	Yes
<b>LS-DYNA Implicit</b>	Simulation and analysis tool for structural mechanics	Linear equation solver	Yes
<b>midas GTS NX</b>	Simulation tool for geo-technical analysis	Linear equation solver(Multi Frontal Solver)	Single only
<b>midas NFX(Structural)</b>	Simulation and analysis tool for structural mechanics	Linear equation solver(Multi Frontal Solver)	Single only
<b>MSC - Marc</b>	Simulation and analysis tool for structural mechanics	Direct sparse solver	Yes
<b>MSC Nastran</b>	Simulation and analysis tool for structural mechanics	Direct sparse solver	Yes
<b>Rocky DEM</b>	Discrete Element Modeling (DEM)-based particle simulation software	Explicit DEM solver (dry/sticky contact rheologies), 1-way & 2-way coupling with ANSYS Fluent and ANSYS Mechanical	Single only
<b>Siemens NX Nastran</b>	Simulation and analysis tool for structural mechanics	Linear equation solver	Single only

## ДИЗАЙН И ВИЗУАЛИЗАЦИЯ

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Autodesk - AutoCAD</b>	2D and 3D CAD design, drafting, modeling, architectural drawing, and engineering software. Supports Open GL. Native DWG™ support.	Surface, mesh, and solid modeling tools, model documentation tools, parametric drawing capabilities. Native DWG™ support.	Single only
<b>Autodesk - AutoCAD Design Suite</b>	AutoCAD 2014 software, plus tools to create, capture, connect, and showcase designs	2D/3D display of designs, interactive 3D presentation with realistic materials, rendering-ray tracing	Single only
<b>Autodesk - 3ds Max</b>	3D animation creative toolset for modeling, animation, simulation, and rendering for games, film, and motion graphics	3D modeling, mesh and surface modeling, improved Nitrous viewport performance, iray rendering	Yes
<b>Autodesk - Inventor</b>	3D mechanical design, documentation, and product simulation	Uses BIM for intelligent building components to improve design accuracy	Single only
<b>Autodesk - Revit</b>	Building Information Modeling (BIM) for structural engineering, and construction	Modeling (BIM) to design, build, and maintain higher-quality, more energy-efficient buildings	Single only
<b>Dassault Systèmes - CATIA</b>	Accelerated UI rendering	Full OpenGL implementation including menus and dialog box	Single only
<b>Dassault Systèmes - CATIA Live Rendering</b>	Realistic 3D Rendering on full CATIA 3D CAD model	Physically Based Rendering with no data preparation thanks to native NVIDIA Iray Photoreal integration and interactive realistic rendering using NVIDIA Iray IRT	Yes + NVIDIA Quadro VCA
<b>Dassault Systèmes - 3DEXCITE Bunkspeed Suite</b>	Easy to use photorealistic rendering software	Iray-based ray-tracing. Animation support. Network rendering	Yes + NVIDIA Quadro VCA
<b>Dassault Systèmes - 3DEXCITE DeltaGen</b>	Redefines high-end 3D visualization and realtime interaction. This latest version gives users a broad suite of robust new features to truly revolutionize processes and help increase visual quality, speed, and flexibility.	Interactive ray tracing and global illumination. Integration with Siemens TeamCenter. Cluster support Realtime & Offline Production Process Integration and scene building. Scene Analysis, Xplore DeltaGen, SDK for DeltaGen	Yes
<b>Dassault Systèmes - SOLIDWORKS</b>	Covers all aspects of product development process with a seamless, integrated workflow—design, verification, sustainable design, communication and data management	High performance in Shaded, Shaded w/ Edges, and RealView modes, FSAA for sharp edges, Order Independent Transparency Real time photorealistic renderings	Single only

<b>NVIDIA Iray</b>	A ready-to-integrate, physically-based, photorealistic rendering solution	Iray Interactive; Iray Photoreal; Iray Cluster. Fast interactive ray tracing; Physically-based, global-illumination rendering; Distributed cluster rendering	Yes
<b>PTC Creo Parametric</b>	Parametric design solution suite	Anti-aliasing, better lighting and enhanced shaded-with-edges mode. Immersive design environment with realistic materials. GRID Support	Single only
<b>Siemens PLM NX and Teamcenter Lifecycle Visualization</b>	Product lifecycle management solutions from design to simulation to production to service	Design software, NX, and PLM viewer applications, TcVis and Active Workspace.	Single only

## АВТОМАТИЗАЦИЯ ПРОЕКТИРОВАНИЯ ЭЛЕКТРОННЫХ УСТРОЙСТВ (EDA)

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Altair FEKO</b>	3D EM modeling and simulation	FDTD solver MoM solver	Yes
<b>ANSYS - HFSS</b>	Simulation tool for modeling 3-D full-wave electromagnetic fields in high-frequency and high-speed electronic components.	Transient solver	Yes
<b>ANSYS - Nexxim</b>	Circuit simulation engine for RF/analog/mixed-signal IC design; IBIS-AMI analysis speedup with GPU computing.	AMI analysis	Single only
<b>CST STUDIO SUITE</b>	3D Electromagnetic modeling and simulation	Several different solvers	Yes
<b>D2S TrueMask</b>	GPGPU-based computational lithography acceleration technology	Simulation and data preparation for Mask Writing -Geometric manipulation of large semiconductor design & manufacturing data -eBeam, Mask Process, and lithography aerial image Simulation -image processing	Yes
<b>Delcross- Savant</b>	Simulation tool for installed antenna performance and antenna-to-antenna coupling	High-frequency solver	Yes
<b>JMAG</b>	FEA software for electromechanical design. Fast solver / High quality mesh / Advanced modeling technologies	EM transient solver EM time harmonic solver EM static solver	Yes
<b>KeySight - ADS</b>	Simulation tool for design of RF, microwave and high speed digital circuits	Transient Convolution simulation with BSIM4 models	Single only
<b>KeySight - EMPro</b>	Modeling and simulation environment for analyzing 3D EM effects of high speed and RF/Microwave components	FDTD solver	Yes
<b>Remcom - XFDTD</b>	3D EM modeling and simulation	FDTD solver	Yes
<b>Rocketick - RocketSim</b>	Verilog simulation	Verilog simulation	Yes
<b>SPEAG - SEMCAD-X</b>	3D EM modeling and simulation	FDTD solver	Yes

## Индустрия масс-медиа и развлечений

### АНИМАЦИЯ, МОДЕЛИРОВАНИЕ, РЕНДЕРИНГ

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>3DAliens - Glu3d</b>	SPH fluid simulation	Faster simulation	Single only
<b>AAA Studio - FurryBall</b>	GPU renderer	CUDA and DirectX GPU rendering	Single only
<b>Autodesk - 3ds Max + NVIDIA Iray</b>	3D modeling, animation, and rendering	Iray interactive, photorealistic and physically correct rendering	Yes
<b>Autodesk - Maya</b>	3D modeling, animation, and rendering	Increased model complexity, larger scenes	Yes
<b>Autodesk - Motion Builder</b>	Character animation and motion capture	Increased model complexity at interactive rates	Single only



<b>Autodesk - Mudbox</b>	3D sculpting	Increased model complexity at interactive rates	Single only
<b>Blastcode - Kilton/Megaton</b>	Physics-based simulation plug in	Faster simulation	Single only
<b>Cebas - moskitoRender</b>	GPU renderer	CUDA-based GPU rendering	Yes
<b>Chaos Group - V-Ray RT</b>	GPU renderer	CUDA interactive GPU rendering	Yes
<b>Jawset - TurbulenceFD</b>	Physics-based simulation plug-in	Maximus supported GPU simulation using CUDA	Single only
<b>Maxon - Cinema 4D</b>	3D modeling, animation, and rendering	Increased model complexity at interactive rates	Single only
<b>NewTek - Lightwave</b>	3D modeling, animation, and rendering	Increased model complexity at interactive rates	Single only
<b>Otoy - Octane Render</b>	GPU renderer	GPU rendering	Yes
<b>Pixologic - Sculpttris</b>	3D sculpting	Increased model complexity at interactive rates	Single only
<b>Redshift - Renderer</b>	GPU-accelerated, biased renderer	CUDA-based GPU final-frame rendering	Yes
<b>Side Effects - Houdini</b>	3D modeling, animation, and rendering	Maximus supported GPU simulation using OpenCL	Single only
<b>The Foundry - Mari</b>	3D paint	Increased model complexity at interactive rates	Single only
<b>The Foundry - Modo</b>	3D modeling, animation, and rendering	Increased model complexity, larger scenes	Single only

## ЦВЕТКОРРЕКЦИЯ, ШУМОПОДАВЛЕНИЕ

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Adobe - SpeedGrade CC</b>	Color grading	Real-time grading and finishing with Lumetri Deep Color Engine.	Single only
<b>ARRI - RAW Converter</b>	RAW de-Bayering and primary grading	CUDA-accelerated de-bayering and grading	Single only
<b>Assimilate - Scratch</b>	Color grading and finishing	Accelerated debayering for real-time digital finishing.	Single only
<b>Blackmagic Design - DaVinci Resolve</b>	Color grading	Real-time color correction and de-noising	Yes
<b>Canon - Cinema RAW SDK</b>	RAW de-bayering	GPU-accelerated de-Bayering	Single only
<b>Cinnafilm - Dark Energy</b>	Application and plug-in for image enhancement	Image de-noising and restoration	Yes
<b>Digital Vision - Nucoda</b>	Color grading	Real-time color correction	Single only
<b>Fastvideo - Debayer</b>	High performance GPU debayer	High performance debayer on CUDA	Yes
<b>Filmlight - Baselight</b>	Color grading	Real-time color correction	Yes
<b>Marquise Technologies - Rain</b>	Color grading	CUDA-based real-time color correction	Single only
<b>Quantel - Pablo Rio</b>	Color grading and finishing	Real time color correction	Yes
<b>Red Digital Cinema - REDCINE-X PRO</b>	Primary Color grading	CUDA-accelerated de-bayering and grading	Single only
<b>Red Giant - Magic Bullet Looks</b>	Color and finishing tools	Faster effects	Single only
<b>SGO - Mistika</b>	Color grading and finishing	Real-time color correction and finishing	Single only
<b>The Foundry - COLORWAY</b>	Color grading	Accelerated color grading	Single only
<b>The Pixel Farm PFClean</b>	Image restoration and remastering	CUDA-based image processing acceleration	Single only
<b>Wavelet Beam - Grain and Noise Reducer</b>	Video noise reduction	CUDA-accelerated grain and noise reduction	Yes

## СПЕЦЭФФЕКТЫ, КОМПОЗИТИНГ

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Adobe - After Effects CC</b>	Motion graphics and effects	3D ray tracing engine based on NVIDIA OptiX	Yes
<b>Autodesk - Flame Premium</b>	Finishing and color grading	Integrated toolset for 3D VFX, editorial, and color grading	Single Only
<b>Boris FX - Continuum Complete</b>	Visual effects plug-in	Faster effects	Single only
<b>CoreMelt - Complete</b>	Visual effects plug-in	Faster effects	Single only
<b>eyeon - Fusion</b>	Effects and compositing	Faster effects	Single only
<b>GenArts - Monsters GT</b>	Visual effects plug-in	Faster effects	Single only
<b>GenArts - Sapphire</b>	Visual effects plug-in	Faster effects	Single only
<b>Neat Video - Open FX</b>	Video noise reduction plug-in	Faster effects	Single only
<b>NewBlueFX - Video Essentials</b>	Video effects plug-in	Faster effects	Single only
<b>Pixelan - FilmTouch</b>	Video effects plug-in	Faster effects	Single only
<b>Re:Vision Effects - Twixtor</b>	Visual effects plug-in	Faster effects	Single only
<b>Red Giant - Effects Suite</b>	Visual effects plug-in	Faster effects	Single only
<b>ROBUSKEY</b>	Chroma keyer plug-in	Faster effects	Single only
<b>SGO - Mamba FX</b>	High-end compositing	Faster keying, tracking, painting and restoration	Single only
<b>The Foundry - HIERO</b>	Shot management, conform and review timeline	Better interactivity	Single only
<b>The Foundry - NUKE, NUKEX and NUKE Studio</b>	Compositing tools with 3D tracker	Faster effects	Single only
<b>Video Copilot - Element 3D</b>	3D object based particle system	Faster effects	Yes
<b>Video Copilot - Twitch</b>	Video effects plug-in for After Effects	Faster effects	Single only

## РЕДАКТИРОВАНИЕ ВИДЕО И ИЗОБРАЖЕНИЙ

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Adobe - Photoshop CC</b>	Image editing	Over 30 effects for smoother image manipulation in Mercury Graphics Engine	Single only
<b>Adobe - Premiere Pro CC</b>	Video editing	Mercury Playback Engine for real-time video editing & accelerated rendering	Yes
<b>Apple - Final Cut Pro</b>	Video editing	Faster effects	Single only
<b>Autodesk - Smoke</b>	Finishing and editing	Faster effects	Single only
<b>Avid - Media Composer</b>	Video editing	Faster video effects, unique stereo 3D capabilities	Single only
<b>EditShare - Lightworks</b>	Video editing	Faster effects	Single only
<b>Grass Valley - Edius Pro</b>	Video editing	Faster effects	Single only
<b>Imagine Communications - Velocity</b>	Video editing	Faster effects	Single only
<b>Quantel - Qube</b>	Broadcast video editing	Faster video effects, unique stereo 3D capabilities	Single only
<b>Sony - Vegas Pro</b>	Video editing	Faster video effects and encoding	Single only

## ПЕРЕКОДИРОВАНИЕ

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>ArcVideo - Core</b>	Video processing and transcoding	Accelerated transcoding and encoding	Yes

<b>ArcVideo - Live</b>	High-density, real-time video processing and encoding	Accelerated broadcast encoding with NVIDIA CUDA and NVENC	Yes
<b>Cinnafilm - Tachyon</b>	Standards conversion	Video processing and frame rate conversion	Yes
<b>Comprimato - JPEG2000 Codec</b>	JPEG2000 encoding and decoding for DCP, IMF, video editing, broadcast contribution, and archiving	Faster than real-time UltraHD / 4K, lossy and mathematically lossless, high bit-depth (HDR), performance scalable, GPU accelerated	Yes
<b>Dalet - Amberfin</b>	Transcoding and video quality analysis	GPU-accelerated video processing and encoding	Single only
<b>Digimetrics - Aurora</b>	Automated video quality measurement	GPU-accelerated video quality assessment	Single only
<b>Elemental - Elemental Live</b>	Live streaming video processing and encoding	Video encoding and video processing	Yes
<b>Elemental - Elemental Server</b>	File-based video processing and encoding	Video encoding and video processing	Yes
<b>ERLAB - Multiplatform Transcoder</b>	Video processing and encoding software	Pre-processing encoding, Decoding, Post-processing and delivery	Single only
<b>Fastvideo - H.264 encoder</b>	H.264 encoding on GPU	NVENC accelerated video encoding	Yes
<b>Fastvideo - Resizer</b>	Batch JPEG resizer	Batch JPEG resize on CUDA	Yes
<b>Fastvideo - SDK</b>	JPEG, JPEG2000, Raw Bayer codecs	Fast JPEG, JPEG2000, Raw Bayer encoding and decoding on CUDA	Yes
<b>Interra - Baton</b>	Video quality analysis	GPU accelerated video quality assessment	Single only
<b>isovideo - Viarte</b>	Video standards conversion	CUDA-accelerated video processing and encoding	Yes
<b>METUS - Ingest</b>	Video Recording, Transcoding, and Streaming Software	CUDA Accelerated video recording, encoding and broadcast transcoding.	Single only
<b>Quantel/Snell - Alchemist on Demand</b>	Video standards conversion	GPU-accelerated video processing and encoding	Yes
<b>Root6 - Content Agent</b>	Automated transcoding and workflow management	GPU-accelerated video processing and encoding	Yes
<b>Sorenson Media - Squeeze</b>	Video transcoding application and plug-In	Video encoding and video processing	Yes
<b>Telestream - Vantage</b>	Video transcoding and processing	Video encoding and video processing	Yes
<b>Wowza - Transcoder</b>	H.264 video encoding	NVENC accelerated video encoding	Single only

## ВИДЕОТРАНСЛЯЦИЯ В ПРЯМОМ ЭФИРЕ

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Avid - On-air Graphics</b>	On-air Graphics	Real-time rendering	Single only
<b>Brainstorm - eStudio</b>	Virtual sets and motion graphics	Real-time rendering	Single only
<b>ChyronHego - GS2 Graphics Engine</b>	On-air graphics	Real-time rendering	Single only
<b>ChyronHego - Mosaic</b>	On-air graphics	Real-time rendering	Single only
<b>Cinegy - Type</b>	On-air Graphics	Real-time rendering	Single only
<b>Dalet - Cube</b>	On-air Graphics	Real-time rendering	Single only
<b>Grass Valley - Miranda Vertigo</b>	On-air Graphics	Real-time rendering	Single only
<b>Imagine Communications - Nexio Channelbrand</b>	On-air graphics	Real-time rendering	Yes
<b>Imagine Communications - Nexio G8</b>	On-air graphics	Real-time rendering	Single only
<b>Imagine Communications - Nexio TitleOne</b>	On-air graphics	Real-time rendering	Single only
<b>Monarch - Brodcaast Dscript 3D</b>	3D on-air graphics	Real-time rendering	Single only

<b>Monarch - Virtuoso</b>	Virtual sets and motion graphics	Real-time rendering	Single only
<b>Pixel Power - Clarity</b>	On-air graphics	Real-time rendering	Single only
<b>RT Software - tOG</b>	On-air graphics	Real-time rendering	Single only
<b>Vizrt - Viz Engine</b>	On-air graphics and virtual sets	Real-time rendering	Single only
<b>Wasp3D - CG</b>	On-air graphics and virtual sets	Real-time rendering	Single only

## МОНТАЖ И ЭФФЕКТЫ В ПРЯМОМ ЭФИРЕ

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>3ality Technica - Intellicam</b>	3D stereo camera adjustment	CUDA-based 3D imaging	Single only
<b>Binocle3D - Disparity Killer</b>	3D stereoscopic workflow	CUDA-based 3D imaging	Single only
<b>BlueFish - Fluid 4K Review</b>	Review and approval of 4K content	Real-time video review	Single only
<b>Colorfront - On-Set Dailies</b>	Review, color grading and transcoding on set	Real-time	Yes
<b>eyeon - Dimension</b>	3D stereoscopic workflow	Real-time	Single only
<b>Fastvideo - SDK</b>	Full image processing pipeline on CUDA	Full image processing pipeline for real time machine vision and camera applications. Data unpacking, Shading correction, Color correction, Debayer, LUT, Resize, Sharp, JPEG, JPEG2000, Raw Bayer, H.264 encoding	Yes
<b>Lightcraft - Previzion</b>	On-set virtual production	Real-time, virtual set production	Single only
<b>MTI Film - Cortex Dailies</b>	Review, color grading and transcoding on set	CUDA accelerated grading and transcoding	Single only
<b>The Pixel Farm - PFTrack</b>	3D scene creation and tracking	CUDA-accelerated tracking	Yes
<b>Tweak Software - RV</b>	Review and approval of 4K content	Real-time	Single only

## ВИЗУАЛИЗАЦИЯ МЕТЕОРОЛОГИЧЕСКИХ ДАННЫХ

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Accuweather - Cinemative HD</b>	Weather graphics	Real-time	Single only
<b>Accuweather - Storyteller</b>	Weather graphics	Real-time	Single only
<b>MeteoGraphics - MeteoEarth</b>	Weather graphics	Real-time	Single only
<b>WSI - Max Weather</b>	Weather graphics	Real-time	Single only

## Вычисления в нефтегазовой отрасли

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Acceleware AxRTM AxKTM</b>	Seismic processing	RTM, Kirchhoff, control source, electromagnetism, forward modeling	Yes
<b>BRS Labs AISight for SCADA</b>	Proactive integrity management and real-time precursor alerts for enhanced SCADA operations in oil and gas.	24/7 real-time analysis and alerting scaling to thousands of sensors across remote and geographically dispersed locations including historical analysis and trend reports	Yes
<b>CGG- GeoVation</b>	Seismic processing	Multiple algorithms (RTM, etc)	Yes
<b>CGG- Inside Earth</b>	Seismic interpretation	Horizon orientation attributes; automated fault extraction, Curvature Attributes	Yes

<b>Echelon Stoneridge Technology</b>	Reservoir Simulator	Fully GPU-accelerated reservoir model, including dual-perm, dual porosity, pressure varying perm and porosity. Eclipse compatible input deck	Yes
<b>ffa Geoteric</b>	Seismic interpretation	Attributes calculations, geobodies extraction	Yes
<b>ffa SEA3D Pro</b>	Seismic interpretation	Attributes calculations, geobodies extraction	Yes
<b>ffa SVI Pro</b>	Seismic interpretation	Attributes calculations, geobodies extraction	Yes
<b>GeoMage Multifocusing</b>	Seismic processing	Advanced seismic imaging technologies and services, as well as interpretation, geological modeling, and reservoir characterization	Yes
<b>HUE Headwave Suite</b>	Seismic interpretation	Attributes calculations, Volume Rendering	Yes
<b>HUE HUESpace</b>	Seismic interpretation	Interpretation development platform	Yes
<b>OpenGeo Solutions OpenSeis</b>	Seismic processing	Spectral Decomposition	Yes
<b>Panorama Tech</b>	Seismic processing, Modeling	Multiple algorithms (RTM, etc)	Yes
<b>Paradigm Echos RTM</b>	Seismic processing	RTM algorithm	Yes
<b>Paradigm Geophysical VoxelGeo</b>	Seismic interpretation	Volume Rendering, Horizon Flattening	Yes
<b>Paradigm SKUA</b>	Reservoir modeling	Faults, Horizons and Flow Simulation Grid	Yes
<b>PumaFlow IFP</b>	Reservoir Simulation	GPU-accelerated linear solver	Yes
<b>Ridgeway Kite Simulator</b>	Reservoir Simulation	Fully GPU-accelerated reservoir model, including surface facilities and multiple realization history matching	Yes
<b>Roxar RMS</b>	Reservoir modeling	Multi GPU capabilities via HUESpace	Yes
<b>Schlumberger Omega2 RTM</b>	Seismic processing	Multiple algorithms (RTM, etc)	Yes
<b>Seismic City Prestack Interpretation</b>	Seismic processing	Multiple algorithms (RTM, etc)	Yes
<b>SpectraSeis</b>	Seismic processing	Full elastic wave-equation imaging and analysis of microseismic fracture data	Yes
<b>Stoneridge Technologies GAMPACK</b>	Reservoir simulation	GPU Algebraic MultiGrid Package	Yes
<b>Tsunami A2011</b>	Seismic processing/Imaging package	RTM processing	Yes
<b>Tsunami RTM</b>	Seismic processing	RTM algorithm	Yes

## Исследовательские задачи в научно-образовательной сфере

### ВЫЧИСЛИТЕЛЬНАЯ ХИМИЯ И БИОЛОГИЯ

#### Биоинформатика

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>BarraCUDA</b>	Sequence mapping software	Alignment of short sequencing reads, alignment of indels with gap openings and extensions	Yes
<b>BEAGLE-lib</b>	BEAGLE is a high-performance library that can perform the core calculations at the heart of most Bayesian and Maximum Likelihood phylogenetics packages. It can make use of highly-parallel processors such as those in graphics cards (GPUs) found in many PCs.	Evaluation of likelihood for sequence evolution on trees and Arbitrary models (e.g. nucleotide, amino acid, codon)  Speed-ups (over CPU only version): nucleotide model = up to 25x, codon model = up to 50x	Yes



<b>Campaign</b>	An open-source library of GPU-accelerated data clustering algorithms and tools	K-means (and Kps-means, a K-means variant for GPUs with parallel sorting for improved performance), K-medoids, K-centers (a K-medoids variant in which medoids are placed only once according to a heuristic), Hierarchical clustering and Self-organizing map	Single only
<b>CUDASW++</b>	Open source software for Smith-Waterman protein database searches on GPUs	Parallel search of Smith-Waterman database	Yes
<b>CUSHAW</b>	Parallelized short read aligner	Parallel, accurate long read aligner for large genomes	Yes
<b>G-BLASTN</b>	GPU-accelerated nucleotide alignment tool based on the widely used NCBI-BLAST	Blastn and megablast modes of NCBI-BLAST	Single only
<b>GPU-BLAST</b>	Local search with fast k-tuple heuristic	Protein alignment according to BLASTP	Single only
<b>mCUDA-MEME</b>	Ultrafast scalable motif discovery algorithm based on MEME	Scalable motif discovery algorithm based on MEME	Yes
<b>MUMmer GPU</b>	High-throughput local sequence alignment program	Aligns multiple query sequences against reference sequence in parallel	TBD
<b>NVBIO</b>	NVBIO is an open source C++ library of reusable components designed to accelerate bioinformatics applications using CUDA.	Data structures, algorithms, and utility routines useful for building complex computational genomics applications on CPU-GPU systems	Yes
<b>NVBowtie</b>	A largely complete implementation of the Bowtie2 aligner on top of NVBIO	Good coverage of Bowtie2 features and comparable quality results	Yes
<b>PEANUT</b>	Read mapper for DNA or RNA sequence reads to a known reference genome.	Achieves supreme sensitivity and speed compared to current state of the art read mappers like BWA MEM, Bowtie2 and RazerS3. PEANUT reports both only the best hits or all hits.	Single only
<b>REACTA</b>	A modified version of GCTA with improved computational performance, support for Graphics Processing Units (GPUs), and additional features. The purpose of REACTA is to quantify the contribution of genetic variation to phenotypic variation for complex traits.	GRM creation, REML analysis, Regional Heritability (including multi-GPU)	Yes
<b>SeqNFind</b>	SeqNFind® is a powerful tool suite that addresses the need for complete and accurate alignments of many small sequences against entire genomes utilizing a unique hardware/software cluster system for facilitating bioinformatics research in Next Generation sequencing and genomic comparisons.	Hardware and software for reference assembly, blast, SW, HMM, de novo assembly	Yes
<b>SOAP3</b>	GPU-based software for aligning short reads with a reference sequence. It can find all alignments with k mismatches, where k is chosen from 0 to 3	Short read alignment tool that is not heuristic based; reports all answers	Yes
<b>SOAP3-dp</b>	SOAP3-dp: Ultra-fast GPU-based tool for short read alignment via index-assisted dynamic programming	Borrows-Wheeler Transformation, Dynamic Programming	Yes
<b>UGENE</b>	Opensource Smith-Waterman for SSE/CUDA, Suffix array based repeats finder and dotplot	Fast short read alignment	Yes
<b>WideLM</b>	Fits numerous linear models to a fixed design and response	Parallel linear regression on multiple similarly-shaped models	Yes

## Материаловедение

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>gWL-LSMS</b>	Materials code for investigating the effects of temperature on magnetism	Generalized Wang-Landau method	Yes
<b>PEtot</b>	First principles materials code that computes the behavior of the electron structures of materials	Density functional theory (DFT) plane wave pseudopotential calculations	Yes
<b>QMCPACK</b>	Solves the many-body Schrodinger equation for electronic structures using a quantum Monte Carlo method	Main features	Yes
<b>Quantum Espresso/ PWscf</b>	An integrated suite of computer codes for electronic structure calculations and materials modeling at the nanoscale	PWscf package: linear algebra (matrix multiply), explicit computational kernels, 3D FFTs	Yes
<b>VASP</b>	First principles materials code that computes the behavior of electronic structures based on quantum theory	Blocked Davidson and RMM-DIIS iterative solvers (ALGO=NORMAL, FAST, & VERYFAST), as well as hybrid Hartree-Fock DFT functionals including exact exchange	Yes

## Молекулярная динамика

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Abalone</b>	Molecular modeling program focused on molecular dynamics of biopolymers. In addition, it can interact with external quantum chemical programs	Molecular graphics , Molecular model building, Geometry optimization, Molecular dynamics simulations, Hybrid Monte Carlo, Adaptive Temperature Hybrid Monte Carlo, Replica exchange, Implicit and explicit water models, Interaction with quantum programs, GPU acceleration	Single only
<b>ACEMD</b>	GPU simulation of molecular mechanics force fields, implicit and explicit solvent	Written for use only on GPUs	Yes
<b>AMBER</b>	Suite of programs to simulate molecular dynamics on biomolecule	PMEMD Explicit Solvent and GB Implicit Solvent	Yes
<b>CHARMM</b>	MD package to simulate molecular dynamics on biomolecule	Implicit (5x), Explicit (2x) Solvent via OpenMM, now ported natively to GPUs	Yes
<b>DESMOND</b>	High-speed molecular dynamics simulations of biological systems	The code uses novel parallel algorithms and numerical techniques to achieve high performance and accuracy	Yes
<b>ESPResSo</b>	Highly versatile software package for performing and analyzing scientific Molecular Dynamics many-particle simulations of coarse-grained atomistic or bead-spring models as they are used in soft-matter research in physics, chemistry and molecular biology.	Hydrodynamic / Electrokinetic forces P3M electrostatics	Yes
<b>Folding@Home</b>	A distributed computing project that studies protein folding, misfolding, aggregation, and related diseases	Powerful distributed computing molecular dynamics system; implicit solvent and folding	Yes
<b>GPUgrid.net</b>	A distributed computing project that uses GPUs for molecular simulations	High-performance all-atom biomolecular simulations; explicit solvent and binding	Yes
<b>GROMACS</b>	Simulation of biochemical molecules with complicated bond interactions	Implicit (5x), Explicit (2x) Solvent	Yes
<b>HALMD</b>	Large-scale simulations of simple and complex liquids	Simple fluids and binary mixtures (pair potentials, high-precision NVE and NVT, dynamic correlations)	Single only
<b>HOOMD-Blue</b>	Particle dynamics package written grounds up for GPUs	Written for use only on GPUs	Yes
<b>LAMMPS</b>	Classical molecular dynamics package	Lennard-Jones, Gay-Berne, Tersoff, and dozens more potentials	Yes
<b>NAMD</b>	Designed for high-performance simulation of large molecular systems	Full electrostatics with PME and most simulation features; 100M atom capable	Yes

<b>OpenMM</b>	Library and application for molecular dynamics for HPC with GPUs	Implicit and explicit solvent, custom forces	Yes
<b>SOP-GPU</b>	SOP-GPU package, where SOP stands for the Self Organized Polymer Model fully implemented on a GPU, is a scientific software package designed to perform Langevin Dynamics Simulations of the mechanical or thermal unfolding, and mechanical indentation of large biomolecular systems in the experimental subsecond (millisecond-to-second) timescale.	Langevin dynamics simulations using the coarse-grained Self Organized Polymer (SOP) model, Multiple simulation trajectories can be performed simultaneously on a single GPU, Calpha and Calpha-Cbeta models are supported, Simulations of protein forced unfolding, Novel simulations of nanoindentation in silico, Support for hydrodynamic interactions, Up to ~100 ms of simulation time per day, Systems of up to 1,000,000 amino-acids (on GPUs with 6GB or great memory)	Single only

## Вычислительная химия

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Abinit</b>	Allows to find total energy, charge density and electronic structure of systems made of electrons and nuclei within DFT	Local Hamiltonian, non-local Hamiltonian, LOBPCG algorithm, diagonalization/orthogonalization	Yes
<b>ACES III</b>	Takes best features of parallel implementations of quantum chemistry methods for electronic structure	Integrating scheduling GPU into SIAL programming language and SIP runtime environment	Yes
<b>ADF</b>	Density Functional Theory (DFT) software package that enables first-principles electronic structure calculations	Geometry optimizations and frequency calculations with GGA functionals	Yes
<b>BigDFT</b>	Implements density functional theory by solving the Kohn-Sham equations describing the electrons in a material	DFT; Daubechies wavelets, part of Abinit	Yes
<b>CASTEP [In development]</b>	CASTEP is a leading code for calculating the properties of materials from first principles. Using density functional theory, it can simulate a wide range of properties of materials proprieties including energetics, structure at the atomic level, vibrational properties, electronic response properties etc.	TBD	Yes
<b>CP2K</b>	Program to perform atomistic and molecular simulations of solid state, liquid, molecular and biological systems	DBCSP (space matrix multiply library)	Yes
<b>GAMESS-UK</b>	The general purpose ab initio molecular electronic structure program for performing SCF-, DFT- and MCSCF-gradient calculations	(ss/ss) type integrals within calculations using Hartree-Fock ab initio methods and density functional theory. Supports organics and inorganics.	Yes
<b>GAMESS-US</b>	Computational chemistry suite used to simulate atomic and molecular electronic structure	Libqc with Rys Quadrature Algorithm, Hartree-Fock, MP2 and CCSD	Yes
<b>Gaussian [In development]</b>	Predicts energies, molecular structures, and vibrational frequencies of molecular systems	Joint NVIDIA, PGI and Gaussian collaboration	Yes
<b>GPAW</b>	Real-space grid DFT code written in C and Python	Electrostatic poisson equation, orthonormalizing of vectors, residual minimization method (rmm-diis)	Yes
<b>LATTE</b>	Density matrix computations	CU_BLAS, SP2 Algorithm	Yes
<b>MOLCAS</b>	Methods for calculating general electronic structures in molecular systems in both ground and excited states	CU_BLAS	Single only Additional GPU support coming in Version 8

<b>MOPAC2012</b>	Semiempirical Quantum Chemistry	Pseudodiagonalization, full diagonalization, and density matrix assembling via Magma libraries	Single only
<b>NWChem</b>	Calculations	Triples part of Reg-CCSD(T), CCSD and EOMCCSD task schedulers	Yes
<b>Octopus</b>	Used for ab initio virtual experimentation and quantum chemistry calculations	Full GPU support for ground-state, real-time calculations; Kohn-Sham Hamiltonian, orthogonalization, subspace diagonalization, poisson solver, time propagation	TBD
<b>ONETEP [In Development]</b>	ONETEP (Order-N Electronic Total Energy Package) is a linear-scaling code for quantum-mechanical calculations based on density-functional theory	TBD	Yes
<b>Q-CHEM</b>	Computational chemistry package designed for HPC clusters	Various features including RI-MP2	Single Only
<b>QUICK</b>	QUICK is a GPU-enabled ab initio quantum chemistry software package	Running Hartree-Fock and DFT energy on GPU, Supports s, p, d, f orbitals on energy calculation, HF gradient with s,p,d orbital support, GPU-based ERI generator	Yes
<b>TeraChem</b>	Quantum chemistry software designed to run on NVIDIA GPU	Full GPU-based solution; Performance compared to GAMESS CPU version	Yes

## Визуализация и докинг

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Amira®</b>	A multifaceted software platform for visualizing, manipulating, and understanding Life Science and bio-medical data	3D visualization of volumetric data and surfaces	Single only
<b>BINDSURF</b>	A virtual screening methodology that uses GPUs to determine protein binding sites	Allows fast processing of large ligand databases	Single only
<b>BUDE</b>	Molecular docking program	Empirical Free Energy Force field	Single only
<b>FastROCS</b>	Molecule shape comparison application	Real-time shape similarity searching/ comparison	Yes
<b>Molegro Virtual Docker 6</b>	Method for performing high accuracy flexible molecular docking	Energy grid computation, pose evaluation and guided differential evolution	Single only
<b>PaPaRa 2.0</b>	A Vectorized Algorithm for Probabilistic Phylogeny-Aware Alignment Extension	Up to 15-fold run time improvements by deploying SIMD vector intrinsics to accelerate the alignment kernel	Single only
<b>PIPER Protein Docking</b>	Protein-protein docking program	Molecule docking	TBD
<b>PyMol</b>	User-sponsored molecular visualization system on an open-source foundation	Lines: 460% increase Cartoons: 1246% increase Surface: 1746% increase Spheres: 753% increase Ribbon: 426% increase	Single only
<b>VEGA ZZ</b>	Molecular Modeling Toolkit	Virtual logP, molecular surface values	Single only
<b>VMD</b>	Visualization and analyzing large bio-molecular systems in 3-D graphics	High quality rendering, large structures (100M atoms), analysis and visualization tasks, multiple GPU support for display of molecular orbitals	Yes

## ЧИСЛЕННЫЙ АНАЛИЗ

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Accelereyes- ArrayFire</b>	Comprehensive GPU function library	Hundreds of functions for math, signal/ image processing, statistics, and more.	Yes

<b>HiPLAR</b>	3High Performance Linear Algebra in R	Supports GPU and multi-core platforms, compatible with legacy R code, no new data types or operators, auto-tuning, support for R Matrix package	Yes (for algebra functions via Magma 1.5 or later)
<b>Mathematica Wolfram</b>	A symbolic technical computing language and development environment	Development environment for CUDA and OpenCL. GPU acceleration for Wolfram Finance Platform	Yes
<b>MATLAB - Mathworks</b>	GPU acceleration for MATLAB (high-level technical computing language)	Support for 200+ of most used MATLAB functions (incl. Signal Processing, Image Processing, Communications Systems, etc)	Yes
<b>NMath Premium</b>	GPU-accelerated math and statistics for .NET, automatically detects the presence of a CUDA-enabled GPU at runtime and seamlessly redirects appropriate computations to it.	Automatically offloads computations to the GPU	Single only

## ФИЗИКА

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>BQCD</b>	Lattice quantum chromodynamics application, used for nuclear ad high energy physics calculations.	Wilson-clover fermion linear solver	yes
<b>Chemora</b>	Chemora is a system for performing simulations of systems described by differential equations running on accelerated computational clusters	Chemora embeds the equations' computational kernels into dynamically compiled loop nests shaped for input size and GPU structure	Yes
<b>Chroma</b>	Lattice Quantum Chromodynamics (LQCD)	Wilson-clover fermions, Krylov solvers, Domain-decomposition	Yes
<b>CPS</b>	Lattice quantum chromodynamics application, used for nuclear ad high energy physics calculations.	Wilson, domain-wall and Möbius fermion linear solvers	Yes
<b>ENZO</b>	3D block-structured AMR code for cosmological structure formation	Accelerated magneto hydrodynamics solvers	Yes
<b>GTC</b>	Simulates microturbulence and transport in magnetically confined fusion plasma	Electron push and shift (accounting for >80% of run time)	Yes
<b>GTC-P</b>	A development code for optimization of plasma physics. Full science and data sets are included, but in a simplified form to allow performance testing and tuning	Optimized with CUDA. OpenACC development underway	Yes
<b>GTS</b>	Simulates microturbulence and the motion of charged particles and interactions in fusion plasma	Push and shift for both electron and ion dynamics	Yes
<b>HACC</b>	Simulates N-Body Astrophysics	This code has been optimized with CUDA runs in full production mode	Yes
<b>MILC</b>	Lattice Quantum Chromodynamics (LQCD) codes simulate how elemental particles are formed and bound by the "strong force" to create larger particles like protons and neutrons	Staggered fermions, Krylov solvers, Gauge-link fattening	Yes
<b>OSIRIS</b>	Simulates Plasma Physics including Laser interaction	2 dimensions of the particle push have been optimized with CUDA. Additional optimization is being planned with OpenACC	Yes
<b>PIConGPU</b>	A relativistic Particle-in-Cell code that describes the dynamics of a plasma by computing the motion of electrons and ions subject to the Maxwell-Vlasov equation.	Simulation of laser-wakefield acceleration of electrons	Yes
<b>QUDA</b>	Library for Lattice QCD calculations using GPUs	CUDA supports the following fermion formulations: Wilson,Wilson-clover, Twisted mass, Improved staggered (asqtad or HISQ) and Domain wall	Yes



<b>RAMSES</b>	Simulates astrophysical problems on different scales (e.g. star formation, galaxy dynamics, cosmological structure formation)	CUDA acceleration is applied for radiative transfer for reionization, and the hydrodynamic solver using AMR	Yes
<b>XGC</b>	Simulates edge effects for MHD plasma physics	The particle push portion has been optimized with CUDA and is being fully optimized with OpenACC and CUDA	Yes

## Безопасность

ПРИЛОЖЕНИЕ	ОПИСАНИЕ	ПОДДЕРЖИВАЕМАЯ ФУНКЦИОНАЛЬНОСТЬ	ПОДДЕРЖКА MULTI-GPU
<b>Herta Security - BioSurveillance NEXT, BioFinder</b>	Real time facial recognition and forensic alerts against multiple watchlists	Supports crowded scenes, difficult lighting, faster than real-time analysis, partial face concealment	Yes
<b>Intuvision</b>	Video Analytics	Object recognition and change detection	Yes
<b>Mi-Acclib 2.0.1</b>	Accelerated libraries which encompasses high speed multi-algorithm search engines, data security engine and also video analytics engines for text processing, encryption/ decryption and video surveillance respectively.	Text Processing : Exact Match, Approximate\Similarity Text, Wild Card, MultiKeyword and MultiColumnMultiKeyword, etc Data Security: Accelerated Encryption/ Description for AES-128 Vide Analytics: Accelerated Intrusion Detection Algorithm	Yes
<b>MotionDSP - Ikena Forensic Pro, Ikena ISR, Ikena WAMI</b>	Real-time Image Processing and Computer Vision software for Full Motion Video and Wide Area Imagery exploitation	Real-time super-resolution-based video fidelity improvement, geospatial image processing, and CV detection and tracking	Yes
<b>NEC NeoFace® Watch</b>	Face recognition for real-time video surveillance and offline search compared against multiple watch-lists.	Detects & recognizes multiple faces simultaneously in crowds and variable lighting, scales to more cameras, larger face databases	Yes
<b>NerVve - Visual Search Solution (NVSS)</b>	Video / Image Search and Analysis	Video and Image content search	Yes

