About CoE-HPC

To come out as a research hub in solving computational-intensive, scientific & real-world problems, Government of Odisha in collaboration with C-DAC Pune, has established High Performance Computing laboratory as Centre of Excellence in Parala Maharaja Engineering College, Berhampur, Odisha.

Two PARAM Shavak desktop supercomputers are deployed in CoE-HPC with the following names:

- PARAM Shavak High Performance Computing (HPC)
- PARAM Shavak Deep Learning (DL)

PARAM Shavak HPC – Application Areas

- Some HPC applications in scientific research and development are (but not limited to):
  - Bioinformatics: Drug design, Genome sequencing
  - Atmospheric Science: Weather forecasting, Air quality
  - Materials Science: Exploration of new materials
  - CFD: Automobile design and crash simulations
- Parallel programming Indigenous award-winning software tools
  - Onama: Comprises of a well selected set of parallel & serial applications and tools across various engineering disciplines
  - CHReME: C-DAC's HPC Resource Management Engine

PARAM Shavak HPC – Intel Tools

Intel® Parallel Studio XE 2015 Cluster Edition consists of the following components:

- Intel® Advisor XE
- Intel® C++ Compiler XE
- Intel® Fortran Compiler XE
- Intel® Inspector XE
- Intel® Integrated Performance Primitives (Intel® IPP)
- Intel® Math Kernel Library (Intel® MKL)
- Intel® MPI Benchmarks
- Intel® MPI Library
- Intel® Threading Building Blocks (Intel® TBB)
- Intel® Trace Analyzer and Collector
- Intel® VTune Amplifier XE
- GNU* Project Debugger (GDB*) (GPL licensed)

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In collaboration with

PARAM SHAVAK

Center of Excellence- High Performance Computing (CoE-HPC)

Vision:

To come out as a research hub in solving computational-intensive, scientific & real-world problems

Mission:

To collaborate, educate and research for usage of high-performance computing in diversified area of applications.

For information, research & collaboration:-

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PARAM Shavak HPC & DL GPU – Hardware Specification

- Latest Intel multicore processor - Dual Socket Intel Broadwell processor with 14 cores each
- 96 GB RAM – to accommodate large dataset.
- 16 TB of Secondary Storage – with RAID5 configured
- 1KWatt Power Supply
- Ethernet Network Interconnect
- Accelerator
- One number of Nvidia P5000 (In DL GPU SYSTEM) and GP100 (PARAM Shavak HPC System) accelerator cards
- Nvidia Pascal architecture-based co-processing technologies
- DLGPU software environment (with Deep Learning GPU SDK and training system).
- Peak Computing Power: over 25 TF Single Precision

PARAM Shavak DL GPU – Software Specification

- Deep Learning Primitives (cuDNN) for deep neural network applications including convolutions, activation functions, and tensor transformations
- Deep Learning for Video Analytics (DeepStream SDK) for GPU-accelerated transcoding and deep learning inference
- GPU-accelerated BLAS and accelerated linear algebra subroutines for sparse matrices
- Multi-GPU Communication that accelerate Multi-GPU deep learning training on up to eight GPUs
- Deep Learning Inference Engine for production deployment
- GPU-Accelerated Libraries
- Torch 7 – Facebook's Deep Learning framework.
- Caffe – Beginners Deep learning framework from UC, Berkley.
- TensorFlow – Google's machine Intelligence platform.
- Keras – Python wrapper for TensorFlow/Theano. Go-to framework for many researchers.
- MXNet - Lightweight, Portable, Flexible Distributed/Mobile Deep Learning.
- Theano - Define, optimize, and evaluate mathematical expressions involving multi-dimensional arrays efficiently.
- Paddle – Baidu's Parallel Distributed Deep Learning.

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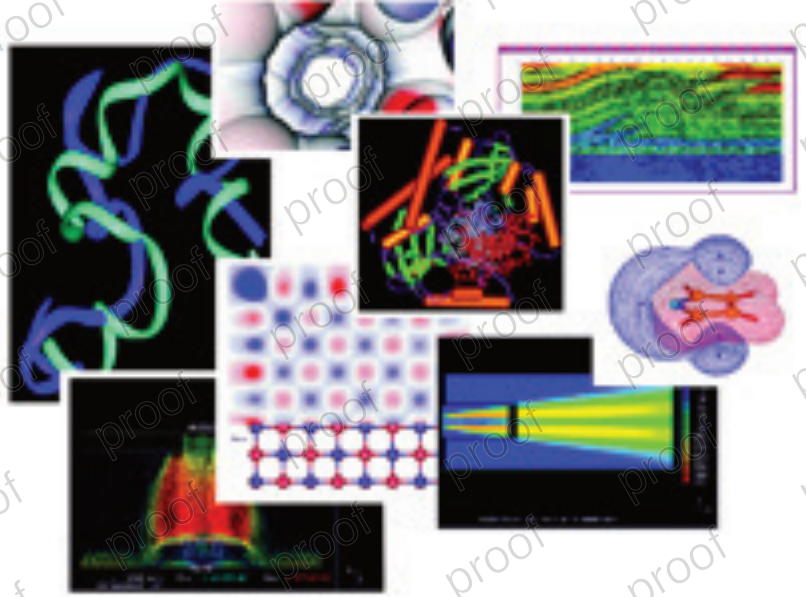

Scientific & Engineering Applications and Libraries

Profiling / Performance Analysis Tools

Performance Libraries | Compilers | Parallel Computing Environment

Job Scheduling and Launching | Cluster Management & Monitoring Software

Operating System | Device Drivers

High Speed Interconnect | Storage

X86, X86_64 Hardware

Accelerators

PARAM Shavak