

Petros Apostolou

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EDUCATION

University of Pittsburgh | Swanson School of Engineering

(04/30/2020)

MSc Research in Mechanical Engineering – Department of Mechanical Engineering & Materials Science

Program Concentration: High Performance Computing (HPC) for Large-Scale Numerical Analysis Systems.

- MS Thesis: [HPC Matrix-Free Conjugate Gradient Solver for Large-Scale Finite Element Analysis on GPUs](#)
Achieved speed up of [82 x times] and scaled up to [217M x elements] on a 12GB Titan V in DP mode.
- MPI Project: Parallel CPU implementation for distributed memory parallelism of the heat equation using inter-node communication “SendRecv” MPICH MPI distribution on [CRC](#) cluster.

PUBLICATIONS (manuscript submitted - 6/25/2020)

Florian Dugast, Wen Dong, Qian Chen, **Petros Apostolou**, Albert To, “**Part-Scale Thermal Process Modeling for Laser Powder Bed Fusion with Matrix-Free Method and GPU Computing**”, Additive Manufacturing

PROFESSIONAL EXPERIENCE

Co-op program at ANSYS Mechanical (MAPDL) – Software Testing (HPC clusters) (5/13/2019 - 12/13/2019)

- Objective: Used HPC scaling analysis to compute the performance and validate CPU and GPU implementations of ANSYS Mechanical Solvers on both Linux and Windows Clusters.
- Cluster Management:

>>> Developed an automated parallel regression testing tool <mapdlUGE.sh> on Linux “Lustre” file system of the CDC cluster, reducing the execution time of 26K tests from 1 week to 6 hours. The script is designed to be executed through ARM API and distributes parallel tests on the compute nodes of the cluster.

PREVIOUS EDUCATION

National Technical University of Athens (NTUA) | School of Mechanical Engineering (Greece, 2015)

- BS Thesis: 3D Unstructured Mesh Displacement – Adaptation using Torsional Springs Technique. The code developed in Fortran90/95 at the [Parallel CFD & Optimization Unit](#).

COMPUTER SKILLS

- Programming: C/C++, CUDA, Python, Fortran, Linux Shell/Bash, PERL, Windows Batch
- Parallelization: MPICH MPI, Intel MPI, OpenMP/ACC, CUDA-Stream/pthreads, OpenACC
- Linear Algebra: CBLAS/CUBLAS, NVIDIA-AMGX, PETSC, FreeFem++, Nek5000, HPCG
- Profilers & Portable APIs: Intel Nvtune, Nvproof, Roofline, SYCLE, Kokkos, Raja
- Schedulers & CVS: UGE/SGE, SLURM, Cobalt, Git, Azure DevOps

REFERENCES

Albert To, PhD (Master Thesis Advisor): albertto@pitt.edu

Roxana Cisloiu, PhD (ANSYS Inc – Canonsburg, Manager): roxana.cisloiu@ansys.com