# Petros Apostolou

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Github: https://github.com/Petros89  •  Personal Website

## 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

Florian Dugast**, Petros Apostolou**, Albert To, "Part-scale heat transfer in LBPF with matrix free and GPU computing" (preprint submitted at Computer Methods in Applied Mechanics and Engineering, 6/8/2020)

## 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