

# Petros Apostolou

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## EDUCATION

**University of Pittsburgh | Swanson School of Engineering**

(Expected graduation: 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 Linear Algebra Solver for Large-Scale Finite Element Analysis on GPUs. Achieved speed up of [82 x times] over its “Ofast” optimized serial version. High performance achieved compared with NVIDIA’s AMGx sparse solver and significantly reduced amounts of memory.
- MPI Project: Parallel CPU implementation for distributed memory parallelism of the heat equation using inter-node communication “SendRecv” MPICH MPI distribution.
- CUDA Project: CUDA implementation for the acceleration of the vibrating membrane wave problem and the optimization of cuBLAS DGEMM for matrix-matrix multiplications on GTX1080 GPU.

## 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 HPC products.
- Cluster Management:

>>> Developed an automated parallel regression testing tool on Linux “Lustre” file system of the cluster, reducing the total execution time of 26K tests from 1 week to 6 hours.

## 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.
- Description: Programmed a mesh adaptation method for mesh using unstructured tetrahedral meshes for use in aerodynamic-shape optimization and aeroelasticity. [Parallel CFD & Optimization Unit](#).

## COMPUTER SKILLS

- Programming: C/C++, CUDA, Fortran, Linux shell-bash scripting, Perl, Python, MATLAB
- Parallel Programming: MPI, GPGPU, OpenMP, OpenACC
- Linear Algebra: cblas, cuBLAS, cuSOLVER, Amgx, Petsc, FreeFem++
- Clusters/Cloud: UGE/SGE, SLURM, MS Azure

## REFERENCES

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

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