Petros Apostolou

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Education

University of Minnesota — Minneapolis, MN
PhD in Computer Science, Minor in HPC for Applied Machine Learning and AI — *Sept. 2020 – On going*
Ongoing Research: HPC in Machine Learning for Early Detection Diagnosis of Phychiatric Disorders.

University of Pittsburgh — Pittsburgh, PA
MSc in Mechanical Engineering, Minor in HPC for Computational Mechanics — *Aug. 2018 – April 2020*
MS Thesis: HPC Matrix-Free Conjugate Gradient Solver for Large-Scale Finite Element Analysis on GPUs

Publications

Florian Dugast, **Petros Apostolou**, Alfonso Fernandez, Wen Dong, Qian Chen, Seth Strayer, Ryan Wicker, Albert C. T, *Part-Scale Thermal Process Modeling for Laser Powder Bed Fusion with Matrix-Free Method and GPU Computing*. Manuscript re-submitted to Additive Manufacturing journal, Oct/13/2020.

Experience

HPC Software Testing Engineer (Internship) — May 2019 – December 2019
ANSYS - Mechanical Business Unit — *Canonsburg, PA*
- Developed an API for parallel regressions on Linux "Lustre" file system of the CDC cluster, reducing the total execution time of 26K tests from 1 week to 6 hours.
- Used HPC scaling analysis to compute and optimize the performance of CPU & GPU implementations of ANSYS Mechanical Solvers on both Linux and Windows Clusters

Graduate Research Assistant — January 2020 – April 2020
University of Pittsburgh — *Pittsburgh, PA*
- Developed a HPC matrix-free conjugate gradient solver on GPUs. The solver achieved an acceleration of 110 × speed-up with a significant decrease in the memory usage allowing for solution of much largerscales.
- Implemented the Distributed Memory Parallelism (DMP) for the heat trasnfer problem using inter-node communication "SendRecv" MPICH MPI distribution on a Linux cluster.

Graduate Teaching Assistant — Sept. 2020 – Now
University of Minnesota — *Minneapolis, MN*
- Fundamental programming concepts using Python language in the computer science course "Introduction to Computing and Programming Concepts"
- Problem solving skills, recursion, object-oriented programming. Algorithm development techniques. Use of abstractions/modularity. Data structures/abstract data types.

Other Education

National Technical University of Athens — Athens, Greece
BSc in Mechanical Engineering, Minor in Computational Fluid Dynamics — *Nov. 2015*
BS Thesis: Computational Techniques in 3D Unstructured Grid Adaptation - Displacement.

Programming Skills

Programming Languages:	C/C++, CUDA, Python, Fortran, Matlab, Bash-Shell, Perl,HTML/CSS
Parallelism & Multithreading:	MPICH, OpenMPI, CUDA-AWARE-MPI, Pthreads, Multi-Streaming
Developer Tools:	Git, Docker, Google Cloud Platform, Azure DevOps, Jupyter, Colab
Algebra Libraries:	AmgX, PetsC, cuBLAS, ScaLAPACK, Eigen, MFEM, FFTW, hypre
Deep Learning Frameworks:	Pytorch, Caffe, CuDNN, Keras, Tensorflow, horovod, fastai

References

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Suma Jacob (MD, PHD) sjacob@umn.edu, Conelea Christine (PHD, LP): cconelea@umn.edu