Benjamin Czaja

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Experience

High Performance Computing Advisor May 2021 – Present

Dutch National Supercomputer - SURF B.V.

- Software and system performance analysis, bench-marking, and regression testing on Dutch (tier-1) and European (tier-0) supercomputers
- Software stack installation, maintenance, and contributor to easybuild open-source community.
- Topic lead for energy efficient computing.
- Teacher: "High Performance Computing in Python" and "Energy Efficient Computing"

Ph.D. Research Jan. 2017 – Dec. 2020

University of Amsterdam

- Core developer for HemoCell, two open-source cell resolved blood flow solvers. Both models are developed for deployment on high performance distributed computing facilities.
- Pursued and organized collaboration with two external experimental groups (one in U.S.A. and the other in Canada).
- Lead author on three peer reviewed scientific journal articles and co-author on three additional articles.

Visiting Scholar March 2019 – June 2019

University of Michigan - College of Chemical Engineering

- Designed/conducted in-vitro blood flow experiments using the HemoCell software. Lead author on the resulting publication in PLOS computational biology.
- Designed cover image of the research project using Blender, which was selected for the March 2020 issue cover.

Master Thesis Supervisor Sep. 2018 – Aug. 2020

University of Amsterdam

- Conceived, organized, and was the daily supervisor on two computational science master student thesis projects. Both students graduated on time, and both projects resulted in submissions to peer reviewed journals.

Education

Ph.D., Computational Science Amsterdam, the Netherlands

University of Amsterdam *Jan. 2017 – Dec 2020*

Master of Science, Astronomy and Astrophysics Innsbruck, Austria

University of Innsbruck – University of Padua – University of Göttingen *Aug. 2014 – Sep. 2016*

Bachelor of Science, Physics Salt Lake City, U.S.A.

University of Utah *Aug. 2007 – Dec. 2012*

Projects

Energy Aware Runtime | *C, SQL* Jul. 2022 – Present

- Contributed to the development and stability of the code base as it was deployed on the Dutch supercomputer (AMD Rome/Genoa CPUs). Application Characterization.

GiSmo | *C++, OpenMP, MPI* Jul. 2023 – Present

- Bench-marking hybrid (OpenMP-MPI) GiSmo code base on AMD Rome (EPYC 7H12) and AMD Genoa (EPYC 9654) Compute architectures.

MercuryDPM | *C++, MPI, Subversion* Feb. 2022 – May 2022

- Ported the MPI C++ bindings (which were deprecated in MPI-3.0 standard) to C bindings of the code base.

HemoCell | *C/C++, Python, HDF5, Fortran, Slurm, HTML, CSS, MPI, Singularity* Jan. 2017 – Dec 2020

- Core developer for multiple HPC applications focused on solving physiological blood flow problems.

Technical Skills

Languages: Python, C/C++, HTML/CSS, Fortran, Bash
Frameworks/Libraries: OpenMP, MPI, NumPy, pandas, Numba, concurrent.futures, HDF5, Bootstrap, Hugo
Tools: Git, Blender, Paraview, Slurm, Docker, Singularity