Backend developer

David Celný

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Programming

C,CUDA

Python

FORTRAN 95

UNIX scripting

MATLAB

Rust

Languages

Czech

English

German
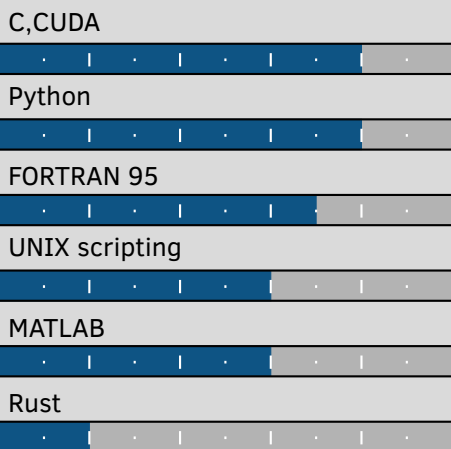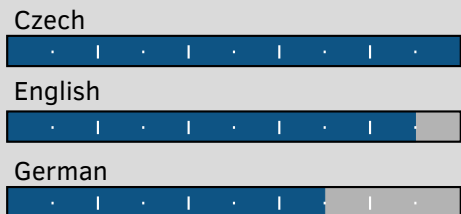
Personal skills

Analytic thinking, Problem solving, Communication, Work organisation, Data analysis, SQL, LLM, Git, Libre Office Suite, Inkscape, Krita, Driving license B

Education

2010 – 2013	**B.Sc.** in Mathematical Modelling	FNSPE CTU
	General course with focus on mathematics	
2013 – 2016	**M.Sc.** in Mathematical Engineering	FNSPE CTU
	Major in mathematics, minor in Programming	
2016 – 2024	**Ph.D.** in Mathematical Engineering	FNSPE CTU
	Physics problem solution using simulations and mathematical models.	

Awards

2016	for education at FNSPE.
2016	for best poster at ATCP in Yokohama.
2021 – 2024	highest rank within evaluation of doctoral students at IT CAS

Work Experience

2012 – 2016 Research assistant — Institute of Thermomechanics of the CAS
Contribute to the research of phase interface a fluid properties modelling with mathematical models and molecular simulations. (MATLAB)

2016 – 2017 Researcher — Institute of Thermomechanics of the CAS
Development of generalized model for phase interface and management of research of nucleation. (MATLAB,FORTRAN)

2017 – 2021 Researcher — University of Chemistry and Technology
Development of parallel algorithms for Molecular Dynamics simulations of heterogeneous atomistic systems. (C,CUDA)

2018 – 2019 Research assistant — Ruhr University in Bochum
Investigation of metastable system properties using molecular simulations. (Fortran,Python)

2019 – 2024 Researcher — Institute of Thermomechanics of the CAS
Management of research of nucleation. (Python,FORTRAN) Contribution to research of thermophysical properties of Hydrofluoroethers. (Python)

Publication

- **Celný, D.**, Vinš, V., & Hrubý, J. (2019). Modelling of planar and spherical phase interfaces for multicomponent systems using density gradient theory. Fluid Phase Equilibria, 483, 70-83. Fluid Phase Equil.

- **Celný, D.**, Klíma, M., & Kolafa, J. (2021). Molecular dynamics of heterogeneous systems on GPUs and their application to nucleation in gas expanding to a vacuum. Journal of Chemical Theory and Computation, 17(12), 7397-7405. JCTC

- Fingerhut, R., Guevara-Carrion, G., Nitzke, I., Saric, D., Marx, J., Langenbach, K., Prokopev, S., **Celný, D.**, Bernreuther, M., Stephan, S., Kohns, M., Hasse, H., & Vrabec, J. (2021). ms2: A molecular simulation tool for thermodynamic properties, release 4.0. Computer Physics Communications, 262, 107860. Comp. Phys. Com.

My journey

- Researching a topic at the intersection of mathematics, physics, and algorithmization has developed my skill in navigating complex challenges and finding practical solutions.
- Focusing on area of high performance computing, I've delved into parallel programming on GPUs, where correctness, computational efficiency and time spent implementation become interlocked.
- My Ph.D. experience has further developed my teamwork skills, extending my fluency in three languages to be able to explain complex topics to non-scientific community. Independent research has in turn extended my creative thinking and formulation of new ideas.
- Years of scientific exploration have instilled within me a unique combination of perseverance, dedication, and a strong work ethic.