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Maetveis
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Last updated: September 23, 2025

Gergely Mészáros

Education

2019–2021 **Computer Science MSc**, *Eötvös Lóránd University*, Budapest, *Outstanding*
Modeling specialization: Higher mathematics of modeling, numerical optimization and approximation algorithms. Knowledge of CPU and GPU architectures for high-performance computing.

2016–2019 **Computer Science BSc**, *Eötvös Lóránd University*, Budapest, *Outstanding*

Experience

2024– **Compiler Engineer**, *Intel*, Gdańsk (Poland)
Development and bug fixing for Intel oneAPI DPC++ Compiler, an LLVM based compiler. Areas I've worked on:
- Build system tool support for DPC++ in house and in Open Source tools
- Code Generation for X86 CPUs (Backend Optimization Passes, SelectionDAG)
- Compiler bring-up for Intel GPUs (Clang Front End, IR Passes, GlobalIsel)
- SYCL Language enabling

2021–2024 **Software Performance Engineer**, *Stream HPC*, Budapest (Hungary)
Development benchmarking and optimization of high performance code for various GPU libraries. Notable areas of my work:
- AMD ROCm GPU primitive libraries: rocPRIM, hipCUB, rocThrust, rocRAND
- Optimization work on GPU scientific computing software such as GROMACS and OpenFOAM

2019–2021 **Junior C++ developer**, *Siemens Mobility*, Budapest (Hungary)
Development for the on-board component of a metro railway control system used worldwide.

2018–2019 **C++ developer intern**, *Graphisoft*, Budapest (Hungary)
Took part in the development and bug-fixing of ArchiCAD; a large scale architectural design application.

Notable Open Source Projects I've Contributed to

Clang
Fixes for diagnostics, fixes in the compiler Driver, improvements to testing tools

LLVM - IR transforms and Backends
Numerous contributions, build system fixes, fixes in GPU (AMDGPU, SPIR-V, NVPTX) and X86 backends. As downstream user of LLVM I contribute every fix relevant for upstream.

CMake
Improvements to CMake Support for the Intel C++ Compiler. Improved support for HIP language for Windows and for the NVIDIA platform

Projects

Master thesis

title — *Robust generation of Signed Distance Fields* (translated)

description — Signed distance fields from triangle meshes on the GPU. Written with C++ using the Vulkan API. Through optimizing the program to the architecture of modern graphic cards it greatly improves the performance of an earlier paper.

code — Available on GitLab at gitlab.com/Maetveis/mesh-to-field/-/tree/wip

Bachelor's thesis

title — *3D Modeling of Water surfaces* (translated)

description — Real-time water simulation and rendering on the GPU with OpenGL and C++.

code — Available on GitHub at github.com/Maetveis/SPHWaterPhysics

Skills

Programming Languages	C++, CUDA, HIP, SYCL Familiar with python and MatLab	GPU	Familiar with OpenGL, Vulkan, OpenCL as a user, and exposed to their implementation
Academic skills	Strong mathematical skills, analytic mindset, naturally curious; desire to learn more and experiment	Quick to learn	I can quickly orient myself in new code-bases, debug problems, improve workflows
Tools, platforms	git, CMake, LaTeX, gitlab-ci[1], development and general experience on Linux	Performance, debugging	Deep Understanding of profiling and debugging tools for GPUs and CPUs alike
Personal skills	Good written and spoken communication skills, I'm comfortable driving execution, creating proposals, engaging with communities		

Interests

Video Games	Avid PC gamer, my favorites include platforming and puzzle games.
Hiking	Always interested to explore new areas and enjoy nature with friends.
Movies, Shows	Winding down after a long day with friends or family.

[1] For reference see gitlab.com/Maetveis/currivitae (the source of this CV on GitLab)