

Fabian Meyer

Curriculum Vitae

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github.com/MeyerFabian
Date of Birth: 1992-12-05
Marital status: single

Education

- 04/2019– **Self Education**, [coursera.org](https://www.coursera.org): Machine Learning(Stanford University) and Computers, Waves, Simulations(LMU); pbrt.org: Physically Based Rendering.
- 04/2015– **Master of Science in Computational Visualistics**, *Universität Koblenz-Landau*,
02/2019 Koblenz, (GPA (German): 1.4).
 - Thesis: "GPU Acceleration of the Material Point Method" (Grade: 1.1).
- 10/2011– **Bachelor of Science in Computational Visualistics**, *Universität Koblenz-Landau*,
03/2015 Koblenz, (GPA: 1.6).
 - Thesis: "Simulation of Snow" (Grade: 1.0).
- 08/2003– **A-levels**, *Liebfrauenschule Cloppenburg*, Cloppenburg, (GPA: 2.1).
06/2011
- Programming Algorithms & Data Structures, Real-Time Rendering, Computer Graphics, Com-
Coursework puter Vision & Image Processing, Machine Learning, Animation & Simulation,
Object-Oriented Programming, Software Engineering, Computer Architecture, Med-
ical Computational Visualistics, Functional Programming, Theoretical Computer
Science, Computer Networks, Basics of IT Security, Media Technology, Software
Ergonomics
- Math/Physics Linear Algebra, Calculus, Multivariable Calculus, Mechanics & Thermodynamics,
Coursework Stochastic, Topological Spaces, Algebraic structures
- Design Drawing, Psychology of the Visual System, Visual Culture Studies, Picture Design
Coursework

Work Experience

- 11/2015 **Blue Byte (Ubisoft) Coding Workshop**.
 - Simple physics simulation in Unity with C# utilizing DirectCompute
- 06/2010– **Artharia, Graphic Design & php Programming**.
03/2014 Hobby Project, <http://artharia.de>
 - Development of an RPG Browser Game with php, HTML & CSS.
 - Designed header, maps and more than 250 icons.

Software Projects

- Material Point Method(MPM)**, github.com/MeyerFabian/snow, github.com/mpm-msc/snow
- Implemented the MPM using OpenGL Compute for physically based simulations of continuum material.
 - Designed a shader generator for OpenGL to allow for various permutations of GPGPU compute programs.
 - Enforced Test-driven development to monitor numerical precision and performance metrics.
 - Applied preprocessing of data layout(SoA), binning & counting sort to increase coalescing & caching behaviors and stream compaction of active cell regions.

- Accelerated governing transfers by fusing threads and utilizing the shared memory architecture leading to order-independence of data and up to 10x speedup over a naive GPU implementation.
- **Acquired Knowledge:** OpenGL Compute, C++17, CMake, NVIDIA Nsight, SymPy/Mathematica, GPU Caching + Coalescing & Memory Architecture, Data-Oriented Design, Test-Driven Development, Physical & Particle Simulation, Continuum Mechanics, Partial Differential Equations, Numerics, Finite Element Methods, Shader Generator, Elasticity & Plasticity Theory, Reflection

Voxel Cone Tracing, github.com/MeyerFabian/VoxelConeTracingA0

- Produced deferred shading by rendering to G-buffer and applying shadow/light mapping
- Finalized building and 3D-filtering + mip-mapping of the sparse voxel octree(SPVO)
- Created Ambient Occlusion & simplified Global Illumination shaders cone tracing the SPVO
- **Acquired Knowledge:** OpenGL, CUDA, C++, Ambient Occlusion, 3D-Filtering, Sparse Voxel Octree

Visualization of Molecule Simulation

- Designed & maintained system architecture between three task groups as well as interfacing between C++-Application and Unreal Engine
- Tasked as Integration Manager which includes maintaining and supplying a blessed repository
- Allocating/deallocating memory in MDTraj & Unreal Engine on creation & deletion of molecules
- **Acquired Knowledge:** Git, C++, Unreal Build Tool, Unreal Engine, MDTraj, Memory Allocation

Rust Ray, github.com/MeyerFabian/rust-ray

- Created simple CPU ray tracer with multiple bounces in Rust featuring multi-threading with Rayon.
- **Acquired Knowledge:** Rust, Rayon, Cargo, Mutability & Borrow Checking

Neural Nets, github.com/MeyerFabian/neural_nets

- Action recognition via images and NLP for toxic comments with the `fast.ai` library.
- **Acquired Knowledge:** `fast.ai`, Python, Google Colab, Deep Learning

Fiber, github.com/MeyerFabian/fiber

- Visualized DTI-data in Visualization Toolkit(VTK) & Qt with file managing and different view options.
- **Acquired Knowledge:** CMake, VTK, Qt, C++, Git

Effects of G8/G9 schooling system, <http://193.175.238.89/datasci/index.php/author/fmeyer>

- Preprocessed and visualized schooling system data with D3.js
- **Acquired Knowledge:** Javascript, D3.js, Data Science & Visualization

Skills

Software	OpenGL, C++, Windows, Vim, Git (<i>proficient</i>) Rust, Python, Matlab, CUDA, OpenCL, Unix, Haskell (<i>familiar</i>)
Language	German (<i>native</i>) English (<i>fluent</i>), M.Sc.-Thesis written in English
Math/Physics	Modeling & Simulation, Fluid mechanics, Optics, Complex analysis, Electrodynamics

Hobbies & Interests

Hobbies	Computer Games, Concept Art, Tabletop Role-Playing Games, Inline skating
Interests	Simulation, Game Design, Tactics(Sports), Live-Streaming