

Markus Pawellek

Curriculum Vitae

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lyrahgames

Born on May 7th, 1995 in Meiningen, Germany

Education

Public High School »Goetheschule Ilmenau«, Special Class for Mathematics and Natural Sciences

Sep. 2009 - Jun. 2013

GENERAL UNIVERSITY ENTRANCE QUALIFICATION (ABITUR, GRADE 1.2)

- Graduation with best scores in advanced courses maths, physics, and computer science
- Writing of two term papers on ray tracing and compiler construction using C++
- Winning of several prizes in mathematical and physical olympiads

Technical University Ilmenau

Oct. 2011 - Sep. 2012

EARLY STUDIES: EXPERIMENTAL PHYSICS (1.0)

Friedrich Schiller University Jena

Oct. 2013 - Sep. 2017

B.Sc. PHYSICS (1.7)

Bachelor thesis »Generation of Irradiance Maps« (1.3) on caching the diffuse light distribution of a scene to enable real-time rendering using a ray tracer implemented in C++

Oct. 2015 - Sep. 2018

B.Sc. MATHEMATICS (1.4)

- Specialization on theoretical informatics
- Bachelor thesis »Implementation of a Finite Element Method on a GPU« (1.0) on numerical solutions to the ideal wave equation on two-dimensional manifolds and its implementation in C++ on modern graphics processors using CUDA

Oct. 2017 - May 2020

M.Sc. PHYSICS (1.1)

- Specialization on quantum and gravitational theory
- Master thesis »Design and Implementation of Vectorized Pseudorandom Number Generators and their Application to Simulations of Photon Propagation« (1.1) on exploiting SIMD-capabilities of modern processors in C++ to speed up random number generation while providing a well-designed interface

Oct. 2019 - May 2023

M.Sc. MATHEMATICS (1.1)

- Focus on analysis, numerics, and computer science
- Master thesis »Smoothing Curves on Surface Meshes« (1.3) on reducing the geodesic curvature of initially given discrete curves on polyhedral surfaces for the application in medical surgery

University of Bergen, Norway

Jun. 2022 - Dec. 2022

MASTER THESIS FOR M.Sc. MATHEMATICS

In cooperation with the »Mohn Medical Imaging and Visualization Centre (MMIV)«

Friedrich Schiller University Jena

since Jan. 2023

PH.D. COMPUTER SCIENCE

- Topic »Design and Implementation of a General Framework for Illustrative Visualization«
- Scholarship »Landesgraduiertenstipendien« of Friedrich Schiller University Jena

Skills

Computer Software Tools

C++	Advanced	14 years experience
	<ul style="list-style-type: none">Specialized in graphics programming, numerical mathematics, and computational physics (Visualization, Computational Fluid Dynamics, Path Tracing, Pseudorandom Number Generators)Deeply experienced in build system, low-level, and template meta programming for CPU and GPUWell-educated concerning the modern standards C++11, C++14, C++17, C++20, and C++23	
Further Languages	RUST, C, ASSEMBLER, JAVASCRIPT, PYTHON	Operating Systems
		LINUX, WINDOWS, MACOS

Languages

GERMAN	Native	ENGLISH	Fluent	RUSSIAN	Beginner
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Work Experience

Fraunhofer ITWM Kaiserslautern: Competence Center High Performance Computing (CC HPC)

Sep. 2012	INTERNSHIP
	Implementation of a ray tracer in C++ accelerated by a BVH, created using Morton codes
Oct. 2013 - Jun. 2017	RESEARCH ASSISTANT
	<ul style="list-style-type: none">Improving knowledge and experience concerning program optimization in C++ and C, as well as compiler construction, computer hardware, parallel computing, and computer graphicsImplementation of real-time ray tracers on CPU and GPU in C++ while using state-of-the-art procedures and professional tools, such as OpenGL, Qt, and CUDASupport of the development of a statistics-based analyzation tool for seismic data by implementing histograms, kernel density estimators and color tables in C++ by using Qt

Friedrich Schiller University Jena

Oct. 2017 - Apr. 2018	RESEARCH/TEACHING ASSISTANT
	<ul style="list-style-type: none">Seminar teacher »Mathematical Methods in Physics«Creation of exercise sheets and sample solutions with LaTeXSetting up an automatically compiling, LaTeX-based database for exercise sheets
Sep. 2018 and Oct. 2019	COURSE INSTRUCTOR
	<ul style="list-style-type: none">Elective introductory course for university students on C++ (6 hours a day for two weeks)Elective introductory course for university students on LaTeX (6 hours a day for one week)

ORISA Software GmbH Jena

Apr. 2020 - Sep. 2022	SOFTWARE DEVELOPER
	Research project concerning the multi-objective optimization of laser systems and the visualization of respective Pareto frontiers by using multi-dimensional Delaunay tessellations

Further Interests and Activities

Music	GUITAR, E-GUITAR	Open-Source	BUILD2, BUILD2-PACKAGING
	16 years		4 years of voluntarily educating people, providing tools, and packaging third-party libraries for »build2« organization
Sports	TRICKING, KUNG FU, BREAKDANCE		
	5 years		