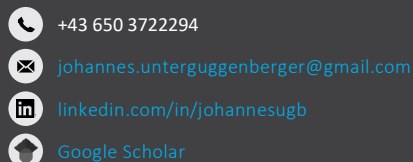
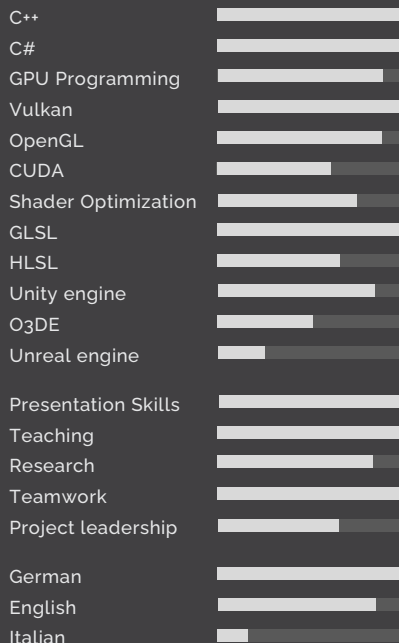


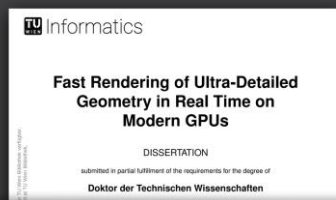
CONTACT



SKILLS, EXPERIENCE



SELECTED HIGHLIGHTS



PhD thesis/dissertation
[Thesis](#)



Master/diploma thesis: "Realistic
Rendering in Mobile Augmented Reality"
[Thesis](#) | [Poster](#)



"Fast Rendering of Parametric Objects
on Modern GPUs"
[Paper \(diglib\)](#) | [Teaser Video](#)

CURRICULUM VITAE

October 2025

Johannes Unterguggenberger

Titles: Dipl.-Ing. Dr.techn. B.Sc

<https://johannesugb.github.io>



EDUCATION

2017–2024	Ph.D. Computer Science , Research Unit of Computer Graphics, TU Wien, Austria Defended on April 10th, 2025 with distinction
2011–2016	Master's programme Visual Computing, TU Wien, Austria Completed on November 15th, 2016
2008–2011	Bachelor's programme Media Informatics, TU Wien, Austria Completed on September 14th, 2011
2007–2008	Bachelor's programme , Computer Sciences, University of Salzburg, Austria
2005–2006	Bachelor's programme , Information Technology and Systems Management, Salzburg University of Applied Sciences, Austria
1999–2004	Secondary education , Electronic Data Processing and Organization, Higher Technical Education Institute Villach, Austria Completed (Matura) on June 14th, 2004
1991–1999	Primary education , Carinthia, Austria

Doctoral Thesis

Title	<i>Fast Rendering of Ultra-Detailed Geometry in Real Time on Modern GPUs</i>
Supervisor	Univ.Prof. Dipl.-Ing. Dipl.-Ing. Dr.techn. Michael Wimmer
Referees	Prof. Dr.-Ing. Marc Stamminger, Prof. Ing. Jiří Bittner Ph.D.

Master Thesis

Title	<i>Realistic Rendering in Mobile Augmented Reality</i>
Supervisor	Univ.Prof. Mag.rer.nat. Dr.techn. Hannes Kaufmann, Mag. Dr. Peter Kán

Bachelor Thesis

Title	<i>Normal Map Filtering</i>
Supervisor	Univ.Prof. Dipl.-Ing. Dipl.-Ing. Dr.techn. Michael Wimmer, Dipl.-Phys. Dr.techn. Ralf Habel

Publications

Johannes Unterguggenberger, Lukas Lipp, Michael Wimmer, Bernhard Kerbl, Markus Schütz, *Fast Rendering of Parametric Objects on Modern GPUs*, In EGPGV24: Eurographics Symposium on Parallel Graphics and Visualization. May 2024.

Johannes Unterguggenberger, Bernhard Kerbl, Michael Wimmer, *Vulkan all the way: Transitioning to a modern low-level graphics API in academia*, Computers and Graphics, 111:155-165, April 2023

Johannes Unterguggenberger, Bernhard Kerbl, Michael Wimmer, *The Road to Vulkan: Teaching Modern Low-Level APIs in Introductory Graphics Courses*, In Eurographics 2022 - Education Papers, pages 31-39. April 2022.

Stefan Stappen, **Johannes Unterguggenberger**, Bernhard Kerbl, Michael Wimmer, *Temporally Stable Content-Adaptive and Spatio-Temporal Shading Rate Assignment for Real-Time Applications*, In Pacific Graphics Short Papers, Posters, and Work-in-Progress Papers, pages 65-66. October 2021.

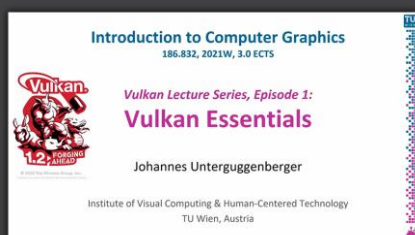
SELECTED HIGHLIGHTS



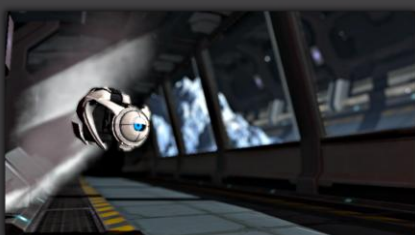
"Conservative Meshlet Bounds for Robust Culling of Skinned Meshes" by Unterwiesing et al., 2021
[Paper \(diglib\)](#) | [Talk](#)



"Fast Multi-View Rendering for Real-Time Applications" by Unterwiesing et al., 2020
[Paper \(diglib\)](#) | [Talk](#) (starts at 38:22)



Vulkan Lecture Series [YouTube Playlist](#)
Listed on [vulkan.org](#) under
[Learn -> Tutorials](#)



"JAM Nightmare". Best demo in course
"Real-Time Rendering", 2012
[Hall of Fame](#) | [YouTube](#)



"TowerdefendAR", 1st place in course
"Augmented Reality on Mobile Devices"
[Course site](#) | [YouTube](#)

Johannes Unterwiesing, Bernhard Kerbl, Jakob Pernsteiner, Michael Wimmer, *Conservative Meshlet Bounds for Robust Culling of Skinned Meshes*, Computer Graphics Forum, 40(7):57-69, October 2021.

Johannes Unterwiesing, Bernhard Kerbl, Markus Steinberger, Dieter Schmalstieg, Michael Wimmer, *Fast Multi-View Rendering for Real-Time Applications*, In Eurographics Symposium on Parallel Graphics and Visualization, pages 13-23. May 2020.

Current Position

2024—ongoing **Senior Computer Graphics Architect**, Huawei Technologies Austria GmbH

C++, shader programming, HLSL, AAA engine development, O3DE, Massively parallel algorithms, GPU performance optimization

Previous Work Experiences

- 2023—2024 **Pre-Doctoral Researcher and Project Assistant**, Vienna University of Technology (TU Wien) | C++, Vulkan, CUDA, point-based rendering, GPU algorithms, GPU performance optimization, teaching, research
- 2022—2023 **Senior Rendering Algorithm Engineer**, Huawei Technologies Austria GmbH | C++, O3DE, graphics programming, geometry, research
- 2017—2022 **Pre-Doctoral Researcher and University Assistant**, TU Wien
C++, Vulkan, OpenGL, graphics programming, teaching, research
- 2016—2017 **Freelancer: Web Development**, Comvexx Software-Entwicklungs GmbH | C#, ASP.NET, web backend development, SQL, web services
- 2007—2016 **Freelancer: Windows and Network Development**, Intergraph GmbH, later Hexagon Safety & Infrastructure
C#, .NET Framework, Windows development, network programming
- 2011—2016 **Freelancer: Augmented Reality (AR) and Game Development**, Imagination Computer Services GmbH, later Humai Technologies GmbH (today Partium Technologies GmbH) | C#, C++, Unity game engine, AR product development, image tracking, SLAM
- 2010—2016 **Freelancer: Mobile App Development**, Tailored Media GmbH
C#, .NET, Windows Store apps, Windows Phone apps, game development, Unity game engine, mobile AR development, image tracking, SLAM
- 2015 **Freelancer: Software Engineer**, PSPDFKit GmbH
C++11, library developer
- 2010—2011 **Freelancer: Software Engineer**, Tools on Air - Broadcast Engineering GmbH, C, Cocoa, Objective-C, MacOS X development, audio programming, network programming
- 2006—2007 **Web Developer**, Sony DADC Austria AG
PHP, web design, HTML, CSS
- 2003—2007 **Freelancer: Software Engineer**, GISquadrat AG
C++, Windows development, MS Access, Visual Basic for Applications
- 2005—2006 **Freelancer: Web Developer**, Interline Webdesign Solutions
Full stack developer, PHP, HTML, CSS
- 2002 **Intern: Software Developer**, Sun Microsystems GmbH
Java, application development

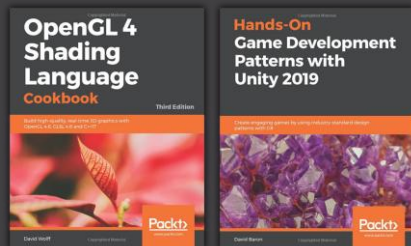
Awards & Achievements

- 2019—2025 The **top four repositories** (in terms of stars) on the Research Unit of Computer Graphics' [GitHub](#) account are repositories where I have been maintainer and main contributor (3) or supervisor (1).
- 2020—2025 I've created the **five most-viewed lectures** on the Research Unit of Computer Graphics' [YouTube](#) channel. Top video has over 42k views.
- 2024 **Best Paper** at *Eurographics Symposium on Parallel Graphics and Visualization* for "Fast Rendering of Parametric Objects on Modern GPUs"
- 2012 **Best Demo** in Real-Time Rendering course
- 2011 **Best AR Game** in Augmented Reality on Mobile Devices course

SELECTED HIGHLIGHTS



Screenshot of a scene from the exercise framework for the course "Algorithms for Real-Time Rendering" (See also [Hall of Fame](#))



Technical reviewer for:
[GLSL Book \(Packt\)](#) | [Unity Book](#)



"Fairy Tale Memories"
Mobile game for iOS and Android
[YouTube](#)



Oculus Mobile VR Jam 2015.
Game "Red Riding Hunt"
[Jam site](#) | [YouTube](#)



"Volumetric Lines" Unity asset
[Asset Store](#) | [GitHub](#)

Teaching Activities

- TU Wien **Algorithms for Real-Time Rendering**, 10–20 students, lectures and exercises, 2018–2024 | [Vulkan](#), [algorithms](#), [shader programming](#), [C++](#)
- Master level **Real-Time Rendering**, 20–30 students, some lectures and exercises, 2017–2023 | [OpenGL](#), [Vulkan](#), [algorithms](#), [shader programming](#), [C++](#)
- TU Wien **Introduction to Computer Graphics**, 110–160 students, transitioned the exercises to Vulkan, 2021–2023 | [OpenGL](#), [Vulkan](#), [GLSL](#), [C++](#)
- Bachelor level **Introduction to Visual Computing**, >500 students, exercises, 2017–2022 | [Linear Algebra](#), [Matlab](#), [Computer Vision](#), [Rendering](#)

Student Supervision

- Master theses **Wolfgang Rumpfer**, "Real-Time Distortion Correction Methods for Curved Monitors"
- Lukas Geyer**, "Adaptive Sampling in position-based fluids"
- Stefan Stappen**, "Improving Real-Time Rendering Quality and Efficiency using Variable Rate Shading on Modern Hardware"
- Bachelor theses **Gerald Kimmersdorfer**, "Vertex Compression with Mesh Shaders for Skinned Meshes"
- Alexander Heinz**, "High-Quality Rendering of Interactive Particle Systems for Real-Time Applications"
- Nicolas Themmer**, "Definition of a Workflow to Import FBX Models in Unity3D at Run-Time While Retaining Material Properties for Various Shader Types"
- Student projects **Stefan Brandmair**, Rust Tutorial
- Andreas Wiesinger**, CMake support and build system for a programming framework used in a foundational graphics course
- Alexander Cech**, Temporal Anti-Aliasing State of the Art, [GitHub](#)
- Hamed Jafari**, Improvements and Additional Features for a Modern C++/Vulkan Rendering Framework
- Elias Kristmann**, Components for Vulkan Launchpad: A framework for Vulkan beginners and introductory graphics courses
- Viktoria Pogrzbacz**, CMake support for Vulkan Launchpad: A framework for Vulkan beginners and introductory graphics courses
- Stefan Fiedler**, Improvements and Additional Features for a Modern C++/Vulkan Rendering Framework
- Jakob Pernsteiner**, Improvements and Additional Features for a Mesh Shader-Based Research Project
- Martin Rumpelnik**, Productivity Features for a C++/Vulkan Rendering Framework and Modernization of Its Code Base
- Lukas Herzberger**, Adding CMake and Linux Support for a modern C++/Vulkan Rendering Framework
- Simon Maximilian Fraiss**, "Focus": Using Real-Time Ray Tracing Innovatively for Gameplay in a Puzzle Game, [GitHub](#)
- Nikole Leopold**, Adding Voxelization using the Hardware Rasterizer to a Cross-Platform C++/OpenGL Engine

Miscellaneous

- 2024 Gave a **Vulkan Tutorial** at the *Central European Seminar on Computer Graphics (CESCG)*, 20–30 participants, Smolenice Castle, Slovakia
- 2023 Gave a **Vulkan Tutorial** at the *Khronos Vulkanised Conference*, 50–70 participants, Munich, Germany | [C++](#), [Vulkan](#)
- 2018–2019 **Technical reviewer** of 2 books: *OpenGL 4 Shading Language Cookbook*, and *Hands-On Game Development Patterns with Unity 2019*, for Packt
- 2016 Released **Fairy Tale Memories**, a *mobile game* on iOS and Android mobile app stores. | [C#](#), [Unity](#), [Game Design](#), [UX](#), [Mobile Game](#)
- 2016 Released **Volumetric Lines** Unity asset, 5 stars, >200 ratings | [C#](#), [Unity](#)
- 2015 Participated in the **Oculus Mobile VR Jam** | [C#](#), [Unity](#), [Virtual Reality](#)