

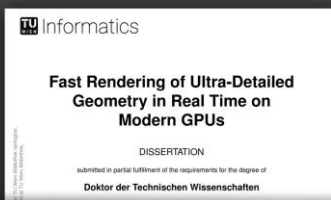
CONTACT

- +43 650 3722294
- johannes.unterguggenberger@gmail.com
- linkedin.com/in/johannesugb
- Google Scholar

SKILLS, EXPERIENCE

C++	██████████
C#	██████████
GPU programming	██████████
Vulkan	██████████
OpenGL	██████████
CUDA	██████████
Shader optimization	██████████
GLSL	██████████
HLSL	██████████
Unity engine	██████████
O3DE	██████████
Unreal engine	██████████
Relational databases	██████████
SQL	██████████
Presentation skills	██████████
Teaching	██████████
LaTeX	██████████
Teamwork	██████████
Project leadership	██████████
Video editing	██████████
German	██████████
English	██████████
Italian	██████████

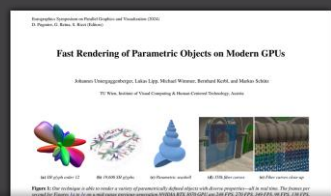
SELECTED HIGHLIGHTS



PhD thesis/dissertation



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

May 2026

Johannes Unterguggenberger

Titles: Dr. techn., Dipl.-Ing., 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, Markus Steinberger, Bernhard Kerbl, Markus Schütz. *Real-Time Rendering Methods with Adaptive Levels of Detail for Fast Rendering of Parametric Objects on Modern GPUs*. To be published in IEEE Transactions on Visualization and Computer Graphics. Accepted on 24-Nov-2025. Article DOI: 10.1109/TVCG.2025.3638697

Johannes Unterguggenberger, Lukas Lipp, Michael Wimmer, Bernhard Kerbl, Markus Schütz. *Fast Rendering of Parametric Objects on Modern GPUs*. In EGPV24: 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.

SELECTED HIGHLIGHTS



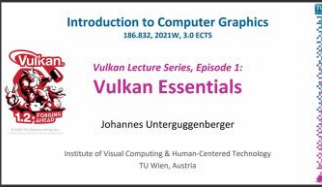
“Conservative Meshlet Bounds for Robust Culling of Skinned Meshes” by Unterguggenberger et al., 2021 [Paper \(diglib\)](#) | [Talk](#)



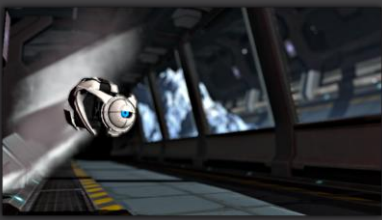
“Fast Multi-View Rendering for Real-Time Applications” by Unterguggenberger et al., 2020 [Paper \(diglib\)](#) | [Talk](#) (starts at 38:22)



Web-based prototype for a funding application: [Interactive online showcase](#)



Vulkan Lecture Series [YouTube Playlist](#) Linked on vulkan.org: [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](#)

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.

Johannes Unterguggenberger, 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 Unterguggenberger, 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

2026 onwards **Self-Employed Contractor** | [C++](#), [Vulkan](#), [GPU and shader programming](#), [Unity](#), [C#](#), [real-time rendering](#), [game dev.](#), [web dev.](#), [mobile apps](#), [teaching](#)

Previous Work Experiences

- 2024–2026 **Senior Computer Graphics Architect**, Huawei Technologies Austria GmbH | [C++](#), [HLSL](#), [O3DE](#), [rendering algorithms](#), [shader optimization](#)
- 2023–2024 **Pre-Doctoral Researcher and Project Assistant**, Vienna University of Technology (TU Wien) | [C++](#), [Vulkan](#), [GLSL](#), [CUDA](#), [C#](#), [WebGL](#) | [JS](#), [point-based rendering](#), [GPU algorithms](#), [shader optimization](#), [teaching](#)
- 2022–2023 **Senior Rendering Algorithm Engineer**, Huawei Technologies Austria GmbH | [C++](#), [O3DE](#), [geometry](#), [rendering algorithms](#), [.NET PowerShell](#)
- 2017–2023 **Freelancer: C# Network Programming**, Intergraph GmbH, Hexagon Safety & Infrastructure | [C#](#), [.NET](#), [TCP/IP](#)
- 2017–2022 **Pre-Doctoral Researcher and University Assistant**, TU Wien | [C++](#), [Vulkan](#), [OpenGL](#), [GLSL](#), [C#](#), [Unity](#), [3D computer graphics](#), [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, and other clients | [C#](#), [.NET](#), [Windows applications](#), [WPF](#), [TCP/IP](#), [SQL](#)
- 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 dev.](#)
- 2010–2011 **Freelancer: Software Engineer**, Tools on Air - Broadcast Engineering GmbH | [C](#), [Objective-C](#), [MacOS X](#), [audio and 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**, Full stack developer, [PHP](#), [HTML](#), [CSS](#)
- 2002 **Intern: Software Developer**, Sun Microsystems GmbH | [Java](#)

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 45k views.
- 2024 **Best Paper** at *Eurographics Symposium on Parallel Graphics and Visualization* for "Fast Rendering of Parametric Objects on Modern GPUs"
- 2023 Successfully applied for **public funding** of a web-based parametric modelling tool with the institution netidee. | [JavaScript](#), [WebGL](#), [Babylon.js](#)
- 2012 **Best Demo** in Real-Time Rendering course
- 2011 **Best AR Game** in Augmented Reality on Mobile Devices course

SELECTED HIGHLIGHTS



Screenshot of exercises for the course "Algorithms for Real-Time Rendering" (See also [Hall of Fame](#))



"Math2Model" web-based modeling tool
[Project Page](#) | [Online Modeling Tool](#)



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
- TU Wien **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 Rumlper**, "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 While Retaining Material Properties for Various Shader Types
- Student projects**
- Stefan Brandmair**, **Leo Halbritter**, **Ferris Schwarz**, supervised a funded project called "Math2Model", a tool for web-based 3D modelling with parametric functions in real time. | [TypeScript](#), [WebGPU](#), [Rust](#), [GitHub](#)
 - 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**, **Martin Rumpelnik**, **Lukas Herzberger** Improvements, Additional Features, CMake and Linux support for a Modern C++/Vulkan Rendering Framework
 - Jakob Pernsteiner**, Improvements and Additional Features for a Mesh Shader-Based Research Project
 - 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](#)