Delio Vicini

delio.vicini@gmail.com | delio-vicini | dvicini.github.io | dvicini

Education

Fall 2017 – present	**Swiss Federal Institute of Technology in Lausanne (EPFL)** PhD in computer science
2015 — 2017	**Swiss Federal Institute of Technology in Zurich (ETH Zurich)** M. Sc. in computer science (visual computing focus track) GPA: 5.92 / 6.00 (graduation with distinction)
2012 — 2015	**University of Bern** B. Sc. in computer science and mathematics, minor in history, GPA: 5.91 / 6.00 (Summa Cum Laude)

Core experience

Fall 2017 – present	**PhD student, Realistic Graphics Lab (EPFL)** Research on physically-based differentiable rendering, volumetric scene representation, geometry reconstruction and machine learning for rendering. Additionally, I also contributed significantly to the Mitsuba 2 open-source research renderer. Supervised by Prof. Wenzel Jakob.
2019	**Research intern, Facebook Reality Labs (5 months)** Internship in the FRL graphics team in Redmond, WA. Work on volumetric scene representations for AR/VR with Anton Kaplanyan. This internship resulted in a SIGGRAPH publication.
2017	**Master thesis, Disney Research / ETH Zurich (6 months)** Master thesis on gradient-domain volumetric path tracing, with Jan Novák and Fabrice Rousselle and supervised by Prof. Markus Gross (grade 6.0/6.0).
2016/2017	**Research intern, Walt Disney Animation Studios / Disney Research (3 months)** Internship on denoising rendered deep images, supervised by Brent Burley and David Adler. This project resulted in a Computer Graphics Forum paper and a patent.
2016	**Research intern, Disney Research (3 months)** Internship on denoising for Monte Carlo rendering using local regression methods, supervised by Jan Novák and Fabrice Rousselle.
2015	**Bachelor thesis, Computer Graphics Group, University of Bern (6 months)** Bachelor thesis “Image Filtering using Halide and a new Denoising Algorithm for Gradient-Domain Rendering”, supervised by Prof. Matthias Zwicker and Marco Manzi (grade 6.0/6.0). The work done in this thesis resulted in a Eurographics paper.

Additional experience

2019 – present	**Reviewer** SIGGRAPH 2022, SIGGRAPH Asia 2019/2020/2021, Transactions on Graphics, Computer Graphics Forum, The Visual Computer, Computers & Graphics, MCQMC 2021

2017 – present	**Teaching assistant, EPFL** Teaching assistant for «Numerical Methods for Visual Computing» and «Advanced Computer Graphics». Supervision of student projects on: denoising for differentiable rendering, neural path guiding, Monte Carlo PDE solvers, direct light sampling hierarchies, Disney BSDF, and geometry instancing.
2014/2015	**Teaching assistant, University of Bern** Teaching assistant for Analysis 1, Analysis 2 and Computer Architecture

Expertise

Analytical	Computer graphics, physically-based and differentiable rendering, volume rendering, Monte Carlo methods, optimization, denoising, neural networks, differential geometry, real-time rendering
Programming	C++, Python, CUDA, PyBind11, PyTorch, Tensorflow, CMake, MATLAB, Halide, OpenGL, GLSL, Java, C#, HTML, CSS
Tools	Git, Linux, Blender, Maya, Photoshop, Illustrator, Adobe Premiere, Nuke, LaTeX
Languages	English (proficient), German (native speaker), French (intermediate)

Honors and awards

Invited speaker at VIS conference (2019, 2021), EPFL EDIC Fellowship (2017), Google Hash Code programming competition finalist (2016), 1st place physically-based simulation project competition (ETH Zurich, 2015), 2nd place rendering competition (ETH Zurich, 2015)

Publications

2022	D. Vicini, S. Speierer, W. Jakob, **Differentiable Signed Distance Function Rendering**, Transactions on Graphics (Proc. of SIGGRAPH 2022)
2022	W. Jakob, S. Speierer, N. Roussel, D. Vicini, **Dr.Jit: A Just-In-Time Compiler for Differentiable Rendering,** Transactions on Graphics (Proc. of SIGGRAPH 2022)
2021	D. Vicini, S. Speierer, W. Jakob, **Path Replay Backpropagation: Differentiating Light Paths using Constant Memory and Linear Time**, Transactions on Graphics (Proc. of SIGGRAPH 2021)
2021	D. Vicini, W. Jakob, A. Kaplanyan, **A Non-Exponential Transmittance Model for Volumetric Scene Representations**, Transactions on Graphics (Proc. of SIGGRAPH 2021)
2019	M. Nimier-David*, D. Vicini*, T. Zeltner, W. Jakob, **Mitsuba 2: A Retargetable Forward and Inverse Renderer**, Transactions on Graphics (Proc. of SIGGRAPH Asia), *joint first authors
2019	D. Vicini, V. Koltun, W. Jakob, **A Learned Shape-Adaptive Subsurface Scattering Model**, Transactions on Graphics (Proc. of SIGGRAPH 2019)
2018	D. Vicini, D. Adler, J. Novák, F. Rousselle, B. Burley, **Denoising Deep Monte Carlo Renderings**, Computer Graphics Forum, 2018 (presented at Eurographics 2019)
2016	M. Manzi, D. Vicini, M. Zwicker: **Regularizing Image Reconstruction for Gradient-Domain Rendering with Feature Patches**, Computer Graphics Forum (Proc. of Eurographics 2016)

Personal details

Born: 30.9.1993 | **Civil status:** single | **Nationality:** Swiss