Antoine Webanck

PhD, Computer Graphics R&D engineer

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webanck

Research and development interests

I am currently interested in bridging the gap between previous offline **Physically Based Rendering (PBR)** and **real-time rendering** by designing new methods leveraging the **ray tracing** hardware accelerations and massively parallel architecture of modern **GPUs**. Previously, I focused on rendering **heterogeneous participating media** (such as procedural clouds or simulated smoke) efficiently, by factoring computations across multiple points of view.

Education

2019 **PhD in Computer Science**, *Université Claude Bernard Lyon 1*, Lyon, France
Subject: procedural generation of atmospheric effects
Advisors: Eric Galin and Eric Guérin

2015 **Master's Degree in Computer Science – Computer Graphics (Honors)**, *Université de Strasbourg*, France

2013 **Bachelor's Degree in Computer Science (Honors)**, *Université de Strasbourg*, France

2010 **Classe Préparatoire aux Grandes Écoles**, *Lycée Kléber*, Strasbourg, France

Work experience

May 2024– **3D programmer**, *Ubisoft La Forge*, Annecy, France
R&D on real-time Global Illumination techniques.

2022–2024 **3D programmer (unrevealed project)**, *Ubisoft Annecy*, Annecy, France
Debugged, profiled and optimized HLSL shaders and C++ in-house game engine supporting the PC, Playstation and XBox platforms with the Vulkan, GNM and Direct3D 12 APIs using tools such as Nsight, Pix, Razor GPU, validation layers, RenderDoc and Aftermath. Developed depth unbounded Gaussian depth blur post-effect ranging from an efficient one-pass over mipmaps to qualitative multipass modes. Added support for emissive materials into probe-based and spherical harmonics based real-time global illumination.

2021 **Research engineer**, *Université Claude Bernard Lyon 1, LIRIS*, Lyon, France
Designed an interactive experiment to analyse the orientational clues learned by humans in urban digital twins.
Project Virtual City (VCity).

2019–2021 **Postdoctoral researcher**, *CNRS, LIRIS*, Lyon, France
Researched consistent and efficient path reuse/shifting methods in the context of joint multiview rendering of heterogeneous participating media; also applied a new optimal-transport projective optimization sampling to volumetric quasi-Monte Carlo rendering.
Project ANR *Comprehensive Analysis of Light Transport Operators for image synthesis (CaLiTrOp)*.

2018–2019 **Assistant lecturer**, *INSA*, Lyon, France
Gave practical courses in Computer Science on Object Oriented Programming in C++, Advanced Algorithmics for AI and Graphs, and Matrix Calculus and Rendering.

2015–2018 **Teaching assistant**, *Université Claude Bernard Lyon 1*, Lyon, France
Gave tutorials and practical courses in Computer Science on Unix, Algorithmics, Functional Programming, and Programming in C, C++, Java, and Scheme.

2016–2017 **Scientific popularization**, *Children's scientific congress*, Université Claude Bernard Lyon 1, Vaulx-en-Velin, France
Introduced research to children later brought to give talks to their pairs during a scientific congress on space.

2016 **Scientific popularization**, Maths à Modeler, Lyon, France
Animated workshops for primary students to discover research in Mathematics and Theoretical Computer Science.

2015 **Research internship**, *LIGUM*, Montréal, Canada
Applied the Gigavoxels library to modeling, animating and rendering complex volumetric scenes.
Advisors: Pierre Poulin and Pascal Schreck.

2014 **Developer internship**, *Euro Information Développements*, Schiltigheim, France
Synchronized development teams on the impact of a new generalized parameterization tool entering production.

2013 **Research internship**, *Icube laboratory*, Strasbourg, France
Developped an OpenGL application to build and subdivide Box-splines curves, surfaces and volumes.
Advisor: Dominique Bechmann.

2012 **Developer internship**, *Caldera*, Eckbolsheim, France
Implemented an algorithm to compute the subset of colors visible to the naked human eye.
Advisor: Arnaud Fabre.

Publications

2022 Basile Fraboni, Antoine Webanck, Nicolas Bonneel, and Jean-Claude Iehl. Volumetric Multi-View Rendering. *Computer Graphics Forum* 41.2 (2022). URL: `https://bfraboni.github.io/eg2022/data/volmvpt-eg2022.pdf`.

July 2020 Loïs Paulin, Nicolas Bonneel, David Coeurjolly, Jean-Claude Iehl, Antoine Webanck, Mathieu Desbrun, and Victor Ostromoukhov. Sliced Optimal Transport Sampling. *ACM Transactions on Graphics* 39.4 (July 2020). ISSN: 0730-0301. URL: `https://hal.archives-ouvertes.fr/hal-02565352/document`.

July 2019 Antoine Webanck. Procedural generation of atmospheric effects. PhD thesis. Université de Lyon, July 2019. URL: `https://tel.archives-ouvertes.fr/tel-02454037/file/TH2019WebanckAntoine.pdf`.

May 2018 Antoine Webanck, Yann Cortial, Eric Guérin, and Eric Galin. Procedural Cloudscapes. *Computer Graphics Forum* 37.2 (May 2018), 431–442. DOI: 10.1111/cgf.13373. URL: `https://hal.archives-ouvertes.fr/hal-01730789/document`.

October 2017 Yann Cortial, Antoine Webanck, Eric Guérin, Adrien Peytavie, and Eric Galin. Modélisation procédurale de nuages multigenre. *Journées Françaises d'Informatique Graphique*. October 2017. URL: `https://hal.archives-ouvertes.fr/hal-01813228/file/Cortial2017.pdf`.

Communications

24 Nov. 2022 **Contest**, *journées Françaises d'Informatique Graphique (j.FIG)*, Sophia Antipolis, France
Shader Grasse Jasmin (third price)

19 April 2018 **Presentation**, *Eurographics*, Delft, Netherlands
Procedural Cloudscapes

9 Nov. 2017 **Poster**, *Journée des Thèses (JdT)*, LIRIS
Génération procédurale d'effets atmosphériques

Responsibilities

4 Apr. 2019 **Member of the procedural rendering workgroup**, *Journée thématique du GdR IG-RV - Modélisation Procédurale*, LIRIS

2017–2018 **Elected representative of the PhD students at the Laboratory Council**, *LIRIS*
- Organized five scientific junior seminars
- Sat at the PhD Committee
- Organized the *Journée des Thèses (JdT)*
- Animated and managed the official website of the PhD students

2017 **Student Volonteer**, *Eurographics*, Lyon, France

2016 **Reviewer**, *Journée des Thèses (JdT)*, LIRIS

Skills

Languages French (native speaker), English (fluent)
Programming C/C++, Python, OpenGL/Vulkan, GLSL/HLSL, LaTeX
Systems Linux, Windows