

# Curriculum Vitae Matthias Moulin

## Personalia

---

City:	Humbeek (Belgium)	Nationality:	Belgian
Birthdate:	██████ 1992	Birthplace:	Vilvoorde (Belgium)
Mobile:	████████████████	Email:	matthias[dot]moulin[at]gmail[dot]com
Driving license:	Car (B)	Hobbies:	Running, saxophone, guitar, game and rendering engine design, programming, gaming



LinkedIn <https://be.linkedin.com/in/matthias-moulin>  
Github <https://github.com/matt77hias> - <https://matt77hias.github.io>

## Education

---

2015 - KU Leuven, Leuven (Belgium)  
Doctor of Philosophy in Engineering (Computer Science)  
• **Research topics:** Acceleration data structures and heuristics for ray tracing queries  
Real-time rendering  
(Global illumination) light transport and rendering algorithms  
Adaptive sampling and reconstruction techniques  
**Supervisor:** prof. dr. ir. Philip Dutré  
• **Funding:** Research Foundation - Flanders (FWO) Oct 2016 - Sep 2020  
Computer Graphics Research Group (KU Leuven) Oct 2015 - Sep 2016

2015 - 2016 Gemeentelijke Academie Wemmel, Wemmel (Belgium)  
Part-Time Arts Education - Music  
• **Major:** Electrical Guitar (Pop/Jazz)

2013 - 2015 KU Leuven, Leuven (Belgium)  
Master of Science in Engineering (Computer Science) — **Magna cum laude** (84.46%)  
• **Major:** Human Computer Interaction (Computer Graphics)  
• **Thesis:** Hybrid Kd-trees for Photon Mapping and Accelerating Ray Tracing (18.5/20)  
**Supervisor:** prof. dr. ir. Philip Dutré

2010 - 2013 KU Leuven, Leuven (Belgium)  
Bachelor of Science in Engineering — **Magna cum laude** (76.83%)  
• **Major:** Computer Science  
• **Minors:** Electrical Engineering and Business Management

2004 - 2010 Sint-Theresiacollege, Kapelle-op-den-Bos (Belgium)  
Algemeen Secundair Onderwijs (ASO) — **Magna cum laude** (84.1%)  
• **Major:** Science-Mathematics

2000 - 2010 Gemeentelijke Academie Grimbergen, Grimbergen (Belgium)  
Part-Time Arts Education - Music — **Magna cum laude** (81.6%)  
• **Major:** Alto Saxophone (Classical Music)

## Experience

---

Oct 2016 - Department of Computer Science, KU Leuven, Leuven (Belgium)  
PhD Researcher funded by the [Research Foundation - Flanders](#) (FWO)

Oct 2015 - Sep 2016 Department of Computer Science, KU Leuven, Leuven (Belgium)  
PhD Researcher funded by the [Computer Graphics Research Group](#) (KU Leuven)

## Publications *(in reverse chronological order)*

---

**MOULIN M.**, DUTRÉ P.: [On the use of Local Ray Termination for Efficiently Constructing Qualitative BSPs, BIHs and \(S\)BVHs](#), To appear in *The Visual Computer*, July 2018.

**MOULIN M.**: [Hybrid Kd-trees for Photon Mapping and Accelerating Ray Tracing](#), Master's thesis, Department of Computer Science, KU Leuven, Belgium, June 2015.

**MOULIN M.**, BILLEN N., DUTRÉ P.: [Efficient Visibility Heuristics for Kd-Trees Using the RTSAH](#), In *Eurographics Symposium on Rendering - Experimental Ideas & Implementations* (June 2015), Lehtinen J., Nowrouzezahrai D., (Eds.), The Eurographics Association, pp. 31–39.

## Skills

---

Programming languages	C++ (98/03, 11/14, 17), C#, C (89/90, 99, 11), Python 2/3, CUDA C/C++, Java, J#, Erlang, Prolog, Racket, Haskell, Elm, JavaScript/TypeScript, Matlab/Octave, Maple, MIPS
Shading languages	HLSL
Modelling languages	UML, OCL
Markup languages	TeX/LaTeX, Markdown, Markdeep, HTML/CSS
Frameworks	D3D11, OpenMP, OpenCV
Tools	Git, SVN, Mercurial, Microsoft Windows family, Microsoft Office family, Visual Studio IDE, Eclipse IDE, RenderDoc, NVIDIA Nsight, Unity3D

## Languages

---

Dutch	Mother tongue
English	Fluent speaker and writer
French	Moderate speaker and writer

## Past projects

---

2048	Fault-resistant, concurrent version of the popular game 2048 ( <i>Erlang</i> )
Fingerprint compression	Fingerprint Compression using wavelet packets ( <i>Python, Matlab</i> )
FrigoShare	Android app with Google App Engine backend for sharing food leftovers ( <i>Java, GAE</i> )
Hybrid Survivor	Hybrid game using Unity3D and the Oculus Rift DK1 ( <i>JavaScript and C#</i> )
Incisor segmentation	Model-based procedure capable of segmenting the incisors in panoramic dental radiographs using an Active Shape Model ( <i>Python and OpenCV</i> )
JUnit Test Deamon	Automatic test deamon extension of the JUnit Framework ( <i>Java</i> )
LRE	Ray tracing engine for rendering .obj scenes with several effects (reflection, refraction, etc.) by using a variety of acceleration data structures ( <i>Java</i> )
MAGE	Game and rendering engine featuring both forward and deferred PBR pipelines with optional Voxel Cone Tracing indirect illumination ( <i>C++17, D3D11, HLSL</i> )
MazeStormer	A physical and emulated autonomous robot powered by LEGO NXT ( <i>Java, leJOS, RabbitMQ</i> )

## Teaching assistantship

---

2016 - 2018	Computer Graphics: Project	<a href="#">[B-KUL-H07Z5A]</a>
2016 - 2017	Capita Selecta Computer Science: Man Machine Interface	<a href="#">[B-KUL-H05N2A]</a>
2016 - 2017	Problem Solving and Engineering Design, Part 3	<a href="#">[B-KUL-H01D4B]</a>
2015 - 2016	Problem Solving and Engineering Design: Computer Science	<a href="#">[B-KUL-H01Q3C]</a>

## Thesis students

---

2017 - 2018	Mathijs Delabie	Genetic Operators for Metropolis Light Transport
2016 - 2017	Menno Keustermans	Estimating Ray Distributions from a Markov Transfer Process
2016 - 2017	Maarten Tegelaers	Forward and Deferred Hashed Shading for Real-time Rendering of Many Lights
2015 - 2016	Jeroen Sanders	Accelerating Ray Tracing using Cone/Cylinder Shafts