Jad N. **Khoury**

Software Engineer · Computer Graphics

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Education

M.Sc. in Computer Science

Sept. 2016 - March 2018

EPFL (Ecole Polytechnique Fédérale de Lausanne) — *Lausanne, Switzerland*

- EPFL university is ranked 10/300 worlwide by Times Higher Education
- Relevant Courses: Machine Learning, 3D Geometry Processing (Mark Pauly), Adv. Computer Graphics (implementations of integrators and BRDFs for the offline raytracer Nori, with Wenzel Jakob)

B.S. in Computer Science

Sept. 2012 - July 2016

EPFL (Ecole Polytechnique Fédérale de Lausanne) — *Lausanne, Switzerland*

- Relevant Courses: Linear Optimization, Theoretical Computer Science, Programming Principles (in SCALA with Martin Odersky), Intro to Computer Vision, Intro to Computer Graphics (real-time OpenGL development with Mark Pauly)

Experience

Graphic Research Scientist - Unity Technologies™

Sep. 2017 - March 2018

Tessellation in Compute Shaders - under the supevision of Jonathan Dupuy — *Grenoble, France*

- Research and implement an efficient triangle and quad tessellation scheme, expected to out-perform existing hardware implementations and taking advantage of Jonathan Dupuy's *Quadtree on GPU* technology.

Graduate Researcher - EPFL Graphics Lab for Rayform™

Sept. 2016 - July 2017

Web Gallery for Goal-Based Caustics - under the supervision of N. Thanikachalam and M. Pauly — *Lausanne, Switzerland*

- Created an interactive Web Gallery for Rayform, showcasing how their caustic products react under user-defined lighting situations
- Owned the design and development of the project from backend to frontend including all network architecture
- Succesfully synchronized the RayTracer I developed for real-time discrete caustics (OpenGL), running on a headless AWS GPU instance, with the ThreeJS browser application, through two NodeJS servers and Socket.io clients (both JS and C++)

Undergraduate Researcher - EPFL Immersive Interaction Group

Feb. 2015 - June 2015

Human Perception of Guided Interaction (VR) - under the supervision of Henrique G. Debarba — *Lausanne, Switzerland*

- Developed and implemented an ISO 92141-9 multidirectional reaching task experiment in a virtual environment, using Unity3D Game Engine (C# scripting), Phascespace motion capture equipment and server, and the Oculus Rift DK2
- Co-authored *Perception of Redirected Pointing Precision in Immersive Virtual Reality*, under review for publication in IEEE VR 2018

Projects and Awards

Advanced Computer Graphics Project - EPFL

April 2017 - June 2017

Photon Mapping Implentations for the Nori RayTracer - with Wenzel Jakob — *Lausanne, Switzerland*

- Received A+ (6/6) grade for implementing photon mapping algorithms allowing to render an underwater scene with no direct lighting.
- Recognized for deciding to use advanced algorithms: Probabilistic Progressive Photon Mapping [Knaus and Zwicker 2011], RGB Anisotropic Volumetric Photon Tracing (using Henyey-Greenstein phase function), Beam Radiance Estimate [Jarosz et al. 2008]

Introduction to Computer Graphics Project - EPFL

March 2016 - June 2016

Procedural Planet Rendering in OpenGL- with Mark Pauly — *Lausanne, Switzerland*

- *Won 1st prize Best Course Project 2016*
- Implemented an infinite terrain rendering program freaturing: on-the-fly complex heightmap [Musgrave, 2015] optimised with ping-pong texture buffers, water reflection & refraction, participating media (ray-marching), adaptive texturing, dynamic tessellation

Skills

Programming	C++, SCALA, Java, LaTeX, Matlab, C# scripting
Graphics & Shading	OpenGL (up to 4.5), Nori Ratracer, ThreeJS, Unity Game Engine

References

Wenzel Jakob	Developer of both Mitsuba and Nori RayTracers, co-author of PBRT v3, author of many offline rendering papers
Jonathan Dupuy	Graphics Researcher at Unity Technologies, author of the *LEADR mapping* and *Quadtrees on GPU*
Mark Pauly	Professor at EPFL LGG Lab, (co)author of over X SIGGRAPH papers
Henrique G. Debarba	Senior researcher at Artanim Foundation, specialized in Embodied Interactions (VR)