



Morteza Mostajab

Researcher and Fan of Computer Graphics and Visualization

Education

- 2012–2016 **Master of Computer Science**, *Technische Universität München*, Munich.
Specialization: Computer graphics and visualization
Thesis Title: Real-time Streamsurface Computation
Supervisor: Prof.Dr. Westermann
Advisors: Dr. Andreas Dietrich, Dr. Frank Michel
- 2006–2011 **Bachelor of Computer Engineering**, *Hamedan University of Technology*, Hamedan, Iran.
Specialization: Computer hardware engineering
Thesis Title: Incorporating affective state of players in video games
Supervisor: Dr. Muharram Mansoorizadeh
- 2002–2006 **Pre-University and High School**, *National Organization for Development of Exceptional Talents' Shahid Beheshti School*, Borujerd, Iran.
Major: Mathematics and physics

Research Interests

Rendering techniques (ray tracing and rasterization)
Virtual reality
SciVis techniques
Computer graphics and visualization
Object oriented programming

Publications

CSG Ray Tracing Revisited-Visualizing Massive Models

by Morteza Mostajab, Andreas Dietrich, Thomas Gierlinger, Frank Michel, Andre Stork (The second draft is ready. It is being prepared for submission).

Real-Time Stream Surface Computation and Rendering Utilizing Heterogeneous Computing

by Morteza Mostajab, Andreas Dietrich, Thomas Gierlinger, Frank Michel, Andre Stork (The first draft is ready. It is being prepared for submission).

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Work Experiences

- 2016–Present **Researcher and developer**, *Fraunhofer IGD*, Darmstadt.
Research Area: Rendering Techniques, and Query-Based Visualization
Project:
 - VELaSSco (Visualization For Extremely Large-Scale Scientific Computing) EC project (VELaSSco.eu).

University Projects and Research

- 2014–2016 **Student researcher and developer**, *Fraunhofer IGD*, Darmstadt.
Related to computer graphics research and developments.
 - Involving into VELaSSco EC project development.
 - Higher-order primitive ray tracer implemented in Intel Embree and NVIDIA OptiX.
 - Virtual reality development with LEAP Motion and Oculus SDK.
 - Scientific visualization related: cross section of a simulation mesh, and streamline computation.
 - Rendering related: software polygon rasterizer, very large OpenGL screenshot capturing component.
- 2014–2014 **Student researcher and developer**, *TUM's TUM's Foerdertechnik Materialfluss Logistik (FML) group*, Garching bei München.
 - Working on 3D visualization of electromagnetic field strength distribution.
- 2013–2014 **Guided Research**, *TUM's Prof. Westermann's chair (Computer Graphics and Visualization)*, Garching bei München.
Topic: Measuring and Evaluating Impact of Ray Sorting Algorithms on Coherency of SIMDs in Voxel-Based Path Tracers.
Content:
 - Implementing a single-threaded voxel-based path-tracer.
 - Instrumentalize path tracer with a SIMD simulator to analyze instruction and data coherency on different processors.
- 2013–2014 **Student researcher and developer**, *TUM's Prof. Navab's chair (Computer Aided and Medical Procedures & Augmented Reality)*, Garching bei München.
 - Working on OpenGL debugging tools.
 - Implementing advanced ray caster for volume rendering of medical data.
- 2013–2013 **Practical Course**, *TUM's Prof. Cremers's chair (Computer Vision)*, Garching bei München.
Topic: GPU Programming in Computer Vision. Implementing optical flow and super resolution algorithms on GPU using CUDA.
- 2012–2013 **Student researcher and developer**, *Metaio GmbH*, München.
 - Developing different Metaio's Junaio browser channels using HTML5, JavaScript, PHP, and Metaio creator.
 - Developing a hair-coloring C++ module using Metaio SDK.
 - Participating into development of a game using Unity.
 - 3D content creation and adjustments for mobile AR scenarios using 3D Studio Max.
- 2012–2013 **Practical Course**, *TUM's Prof. Westermann's chair (computer graphics and visualization)*, Garching bei München.
Topic: Interactive Visual Data Analysis using Direct3D 11 and C++.
Content:
 - Implementing rendering techniques to extract iso-surface, do direct volume rendering, GPU particle tracing and rendering, GPU streamline computation and rendering, and etc.

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- 2012–2012 **Student researcher and developer**, *Fortiss GmbH*, München.
- o Implementing an interface using windows message passing API to update the automotive system visualization in Ciro studio.

Teaching

- 2016 **Seminar Course Supervision**, *Technische Universität Darmstadt*, Germany.
- Topics:
- o Apex Point Map for Constant-Time Bounding Plane Approximation by Laine, Samuli. Karras, Tero.
 - o SIMD Parallel Ray Tracing of Homogeneous Polyhedral Grids by Rathke, Brad; Wald, Ingo; Chiu, Kenneth; Brownlee, Carson.
- 2008–2010 **Teacher Assistant**, *Hamedan University of Technology*, Hamedan, Iran.
- o Teaching assistant, Introduction to Programming, Spring 2008.
 - o Teaching assistant, Advanced Programming, Autumn 2008.
 - o Teaching assistant, Introduction to Assembly 80x86 Programming, Spring 2009.
 - o Teaching assistant, Data Structures, Autumn 2009.
 - o Teaching assistant, Operating Systems, Spring 2010.
 - o Teaching assistant, Computer Graphics, Autumn 2010.

Honors, Awards, Fellowships

- o Winning TUM's Scholarship for International Students in Summer 2013, Winter 2013-14, and Summer 2015.
- o 1st Place (2009 and 2010), 2nd Place (2007) in Local Hamedan, Iran ACM Programming Contests

Languages

English	Professional working proficiency
German	Elementary
Persian	Native

Computer skills

Programming Languages	C/C++, and Python.
Frameworks and Libraries	OpenGL, OpenCL, GLSL shader programming, Qt, Ray tracing libraries (NVIDIA Optix, Intel Embree), Vulkan, Direct3D 11 and HLSL shader programming, and CUDA programming
Operating Systems	Windows, and Linux.
Version Control	Git, SVN, and Perforce.
Documentation	Latex, and MarkDeep.
3D Software Package	3D Studio Max.

References

- **Prof. Dr. Ruediger Westermann**

Homepage: <http://wwwcg.in.tum.de/group/persons/westermann.html>

E-mail: westermann@tum.de

- **Dr. Andreas Dietrich**

E-mail: andi.dietrich@gmail.com

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