

# Curriculum Vitae

## Personal Information

Name: Oliver Mattausch  
Academic Degree: Dr. Dipl.-Inf.  
Address: Ledererg. 5/3, 2700 Wr. Neustadt  
Email: [oliver.mattausch@vision.ee.ethz.ch](mailto:oliver.mattausch@vision.ee.ethz.ch)  
Date of birth: Dec. 2., 1976  
Nationality: Austria  
Marital status: Single, no children  
Languages: German, English, Japanese  
Current Employer: ETH Zurich



## Education

Sep. 1983 – June 1987 Elementary School (Grundschule) in Wiener Neustadt  
Sep. 1987 – June 1995 Secondary School (Gymnasium) in Wiener Neustadt  
June 1995 Graduation (Matura)  
Oct. 1995 – June 2000 Japanology and History major at University of Vienna, Austria  
Oct. 1996 – Sep. 2000 Computer Science major at Vienna University of Technology  
Oct. 2001 – Jan. 2004 (technical computer science track)  
Oct. 2000 – Sep. 2001 Japanese studies at Tokyo Gakugei University  
(mit Monbusho Scholarship)  
Jan. 2004 Graduation as “Diplom-Ingenieur der Informatik” from Vienna University of Technology  
Jan. 2005 – Apr. 2010 Doctoral Program at Vienna University of Technology  
Apr. 2010 Received Ph.D. in Computer Science from Vienna University of Technology  
Okt. 2014 CUDA Course at HLRS Stuttgart

## Professional

Apr. 2004 – Dec. 2004 Software engineer at the VRVis Research Center, Vienna  
Jan. 2005 – Sep. 2011 Project assistant at the Institute of Computer Graphics, Vienna University of Technology

Sep. 2011 – Dec. 2011 JSPS visiting researcher at The Tokyo University/ERATO (supervised by Prof. Takeo Igarashi)  
Feb. 2012 – Sep. 2014 Postdoctoral researcher at the University of Zurich (VMML Lab)  
Okt. 2014 – Nov. 2016 Postdoctoral researcher in Computer Vision Group at ETH

## Project Participation

Apr. 2004 – Dec. 2004 **Real Reflect**, EU project (as software engineer)  
Dec.2004 – June 2007 **GameTools**, EU project  
Juli 2007 – Aug. 2008 **CrossMod**, EU project  
Juli 2007 – Aug. 2011 **General Purpose Visibility**, FWF project  
Feb. 2012 – Feb. 2013 **DIVA**, Marie-Curie Initial Training Network  
Okt. 2014 – Nov. 2016 **UltraVR**, CTI project in collaboration with company Virtamed

## Scholarships/Awards/Project Proposals

2000 Monbusho Scholarship for Japanese language students  
2008 FWF Austrian Science Fund Accepted Project Proposal  
2010 **Best Paper Award** ISMAR 2010 (as co-author)  
2011 Japan Society for the Promotion of Science (JSPS) Postdoctoral Fellowship  
2012 Marie Curie Fellowship (as part of DIVA EU project)  
2016 Nvidia Hardware Grant (GPU donation)  
2016 **Best Paper Award** EG VCBM 2016  
2016 **Best Student Paper Award** Pacific Graphics 2016 (as co-author)

## Patents

1. Orcun Goksel, Oliver Mattausch  
Method and Apparatus for Generating an Ultrasound Scatterer Representation (pending), June 2015
2. Oliver Mattausch, Orcun Goksel  
Ray-tracing Methods for Realistic Interactive Ultrasound Simulation (pending), Sep. 2016

## Programming

Trained in C, C++ Java, OpenGL/OpenGL ES/GL shader language, GPU programming (CUDA), Matlab, PHP, XML/HTML, Delphi  
Operating Systems/environments: Windows/Linux/Cygwin, Visual Studio, Emacs  
Versioning: GitHub/SVN

## Professional Skills

3D modeling (Autodesk Maya, Blender), Adobe Premiere, Adobe Photoshop, Adobe Illustrator, Powerpoint, Excel, Confluence, mesh and point-cloud processing (Meshlab, PCL Point Cloud Library), graphics engine programming (Ogre3D, Nvidia Optix), convex optimization software (CVX, Yall1), FieldII (ultrasound image simulation software)

## Teaching/Supervision

2005 – 2016	Supervision of diploma theses and student projects
Juli 2011	"Real-Time Rendering" Course at the Summer School of UCI (Universidad de las Ciencias Informáticas) in Havana, Cuba
Spring 2012/2013	Organized Computer Graphics Seminar at University of Zurich
Autumn 2012	Organized Computer Graphics Lab at University of Zurich
Autumn 2013	Lecturer for Computer Graphics Course at University of Zurich

## Organization

Apr. 2008 – Apr. 2010	Central European Seminar on Computer Graphics
Jun. 2012	DIVA Summer School at the University of Zurich

## International Program Committees

Eurographics 2012 Posters, Pacific Graphics 2012, VISIGRAPP 2014, 2015, Siggrad 2014, Web3D 2014, Eurographics 2015, Eurographics 2015 STARS

## Referee

Reviewer for Siggraph, Eurographics, EGSR, Pacific Graphics, I3D, Transactions on Graphics, Computer Graphics Forum, IEEE Visualization, Computers & Graphics, etc.

# Publications

## Full conference papers

1. Oliver Mattausch, Thomas Theußl, Helwig Hauser, Meister Eduard Gröller  
Strategies for Interactive Exploration of 3D Flow Using Evenly-Spaced Illuminated Streamlines  
In Proc. of Spring Conference on Computer Graphics, Apr. 2003, Budmerice, Slovakia
2. Oliver Mattausch, Jiří Bittner, Michael Wimmer  
Adaptive Visibility-Driven View Cell Construction  
In Proc. of Eurographics Symposium on Rendering, June 2006, Nicosia, Cyprus
3. Oliver Mattausch, Jiří Bittner, Peter Wonka, Michael Wimmer  
Optimized Subdivisions for Preprocessed Visibility  
In Proc. of Graphics Interface, May 2007, Montreal, Canada
4. Daniel Scherzer, Michael Schwärzler, Oliver Mattausch, Michael Wimmer  
Real-Time Soft Shadows Using Temporal Coherence  
In Advances in Visual Computing, Dec. 2009, Las Vegas, USA
5. Daniel Scherzer, Lei Yang, Oliver Mattausch  
Exploiting Temporal Coherence in Real-Time Rendering  
In Siggraph Asia Courses, Dec. 2010, Seoul, South Korea
6. Martin Knecht, Christoph Traxler, Oliver Mattausch, Werner Purgathofer, Michael Wimmer  
Differential Instant Radiosity for Mixed Reality  
In Proc. of IEEE International Symposium on Mixed and Augmented Reality, Oct. 2010, Seoul, South Korea
7. Jiří Bittner, Oliver Mattausch, Ari Silvennoinen, Michael Wimmer  
Shadow Caster Culling for Efficient Shadow Mapping  
In Proc. of ACM Symposium on Interactive 3D Graphics and Games, Feb. 2011, San Francisco, USA
8. Daniel Scherzer, Lei Yang, Oliver Mattausch, Diego Nehab, Pedro V. Sander, Michael Wimmer, Elmar Eisemann  
A Survey on Temporal Coherence Methods in Real-Time Rendering  
In Eurographics State of the Art Reports, Apr. 2011, Llanduno, Wales
9. Michael Schwärzler, Oliver Mattausch, Daniel Scherzer, Michael Wimmer  
Fast Accurate Soft Shadows with Adaptive Light Source Sampling  
In Proc. of Vision, Modeling, and Visualization, Nov. 2012, Magdeburg, Germany

10. Claudio Mura, Oliver Mattausch, Alberto Jaspe Villanueva, Enrico Gobbetti, Renato Pajarola  
Robust Reconstruction of Interior Building Structures with Multiple Rooms under Clutter and Occlusions  
In Proc. of IEEE Conference on Computer Aided Design and Computer Graphics, Nov. 2013, Hong Kong, China
11. Oliver Mattausch and Orcun Goksel  
Scatterer Reconstruction and Parametrization of Homogeneous Tissue for Ultrasound Image Simulation  
In Proc. of Engineering in Medicine and Biology Conference (EMBC), Aug. 2015, Milano, Italy
12. Christine Tanner, Barbara Flach, Celine Eggenberger, Oliver Mattausch, Michael Bajka, Orcun Goksel  
4D Reconstruction of Fetal Heart Ultrasound Images in Presence of Fetal Motion  
In Proc. of Conference on Medical Imaging Computing & Computer-Assisted Intervention (MICCAI), Oct. 2016, Athens, Greece
13. Oliver Mattausch, Orcun Goksel  
Image-based PSF Estimation for Ultrasound Training Simulation  
In Workshop on Simulation and Synthesis in Medical Imaging (SASHIMI), Oct 2016, Athens, Greece
14. Oliver Mattausch, Orcun Goksel  
Monte-Carlo Ray Tracing for Realistic Ultrasound Training Simulation  
In Workshop on Simulation and Synthesis in Medical Imaging (VMBC), Sep. 2016, Bergen, Norway (**won Best Paper Award**)
15. Oliver Mattausch, Kenneth Vanhoey, Orcun Goksel  
Comparison of Texture Synthesis Methods for Content Generation in Ultrasound Training Simulation  
SPIE Medical Imaging, Feb. 2017, Orlando, US

## Journal Publications

1. Oliver Mattausch, Daniel Scherzer, Michael Wimmer  
High-Quality Screen-Space Ambient Occlusion using Temporal Coherence  
In Computer Graphics Forum, Dec. 2010 (**presented at Eurographics 2011**)
2. Daniel Scherzer, Lei Yang, Oliver Mattausch, Diego Nehab, Pedro V. Sander, Michael Wimmer, Elmar Eisemann  
Temporal Coherence Methods in Real-Time Rendering  
In Computer Graphics Forum, Dec. 2012 (**presented at Eurographics 2013**)
3. Martin Knecht, Christoph Traxler, Oliver Mattausch, Michael Wimmer  
Reciprocal Shading for Mixed Reality  
In Computers & Graphics, Nov. 2012

4. Michael Hecher, Matthias Bernhard, Oliver Mattausch, Daniel Scherzer, Michael Wimmer  
A Comparative Perceptual Study of Soft Shadow Algorithms  
In ACM Transactions on Applied Perception, 2014
5. Claudio Mura, Oliver Mattausch, Alberto Jaspe Villanueva, Enrico Gobbetti, Renato Pajarola  
Automatic Room Detection and Reconstruction in Cluttered Indoor Environments with Complex Room Layouts  
In Computers & Graphics, 2016
6. Oliver Mattausch, Maxim Makhinya, Orcun Goksel  
Realistic Ultrasound Simulation of Complex Surface Models Using Interactive Monte-Carlo Path Tracing  
In Computer Graphics Forum, 2017
7. Christine Tanner, Barbara Flach, Celine Eggenberger, Oliver Mattausch, Michael Bajka, Orcun Goksel  
Consistent reconstruction of 4D fetal heart ultrasound images to cope with fetal motion  
International Journal of Computer Assisted Radiology, 2017

## Conference with Journal Publications

1. Oliver Mattausch, Jiří Bittner, Michael Wimmer  
CHC++: Coherent Hierarchical Culling Revisited  
In Computer Graphics Forum (**Eurographics 2008**), Apr. 2008, Crete
2. Jiří Bittner, Oliver Mattausch, Peter Wonka, Vlastimil Havran, Michael Wimmer  
Adaptive Global Visibility Sampling  
In ACM Transactions of Graphics (**Siggraph 2009**), July 2009, New Orleans, USA
3. Oliver Mattausch, Daniel Scherzer, Michael Wimmer, Takeo Igarashi  
Tessellation-Independent Smooth Shadow Boundaries  
In Computer Graphics Forum (**Eurographics Symposium on Rendering 2012**), June 2012, Paris, France
4. Oliver Mattausch, Takeo Igarashi, Michael Wimmer  
Freeform Shadow Boundary Editing  
In Computer Graphics Forum (**Eurographics 2013**), May 2013, Girona, Spain
5. Oliver Mattausch, Daniele Panozzo, Claudio Mura, Olga Sorkine, Renato Pajarola  
Object Detection and Classification from Large-Scale Cluttered Indoor Scans  
Computer Graphics Forum (**Eurographics 2014**), Apr. 2014, Strasbourg, France
6. Reinhold Preiner, Oliver Mattausch, Murat Arıkan, Renato Pajarola, Michael Wimmer  
Continuous Projection for Fast L1 Reconstruction  
In ACM Transactions on Graphics (**Siggraph 2014**), Aug. 2014, Vancouver, USA

7. Oliver Mattausch, Jiří Bittner, Alberto Jaspe Villanueva, Enrico Gobbetti, Michael Wimmer, Renato Pajarola  
CHC+RT: Coherent Hierarchical Culling for Ray Tracing  
Computer Graphics Forum (**Eurographics 2015**), Apr. 2014, Zurich, Switzerland
8. Claudio Mura, Oliver Mattausch, Renato Pajarola  
Piecewise-planar Reconstruction of Multi-room Interiors with Arbitrary Wall Arrangements  
Computer Graphics Forum (**Pacific Graphics 2016**), Oct. 2016, Okinawa, Japan  
**(won Best Student Paper Award)**
9. Ece Ozkan, Christine Tanner, Matej Kastelic, Oliver Mattausch, Maxim Makhinya, Orcun Goksel  
Robust Motion Tracking in Liver from 2D Ultrasound Images Using Supporters  
International Journal of Computer Assisted Radiology and Surgery (**IPCAI 2017**), June 2017, Barcelona, Spain (**won Best Paper Runner-up**)

## Other Publications

1. Thomas Theußl, Oliver Mattausch, Torsten Möller, Eduard Gröller  
Reconstruction Schemes for High Quality Raycasting of the Body-Centered Cubic Grid  
Technical Report (TR-186-2-02-11), Dec. 2002, Vienna, Austria
2. Oliver Mattausch  
Practical reconstruction and hardware-accelerated direct volume rendering on body-centered cubic grids  
In Proc. of Central European Seminar on Computer Graphics, Apr. 2004, Budmerice, Slovakia
3. Claudio Mura, Alberto Jaspe Villanueva, Oliver Mattausch, Enrico Gobbetti and Renato Pajarola  
Reconstructing Complex Indoor Environments with Arbitrary Walls Orientations  
In Proc. of Eurographics Posters, Apr. 2014, Strasbourg, France
4. Claudio Mura, Oliver Mattausch, Alberto Jaspe Villanueva, Enrico Gobbetti and Renato Pajarola  
Automatic Room Detection and Reconstruction in Cluttered Indoor Environments with Complex Room Layouts  
Invited CaC Talk at SCCG, Apr. 2015, Budmerice, Slovakia

## Theses

1. Practical Reconstruction Schemes and Hardware-Accelerated Direct Volume Rendering on Body-Centered Cubic Grids  
M.Sc. Thesis, Institute of Computer Graphics and Algorithms, Vienna University of Technology, Dec. 2003

2. Visibility Computations for Real-Time Rendering in General 3D Environments  
PhD-Thesis, Institute of Computer Graphics and Algorithms, Vienna University of Technology, Apr. 2010

## Articles in Books

1. Jiří Bittner, Oliver Mattausch, Michael Wimmer  
Game-Engine-Friendly Occlusion Culling  
In SHADERX7: Advanced Rendering Techniques, 2009
2. Oliver Mattausch, Daniel Scherzer, Michael Wimmer,  
Temporal Screen-Space Ambient Occlusion  
In GPU Pro 2 , 2011
3. Daniel Scherzer, Michael Schwärzler, Oliver Mattausch  
Fast Soft Shadows with Temporal Coherence  
In GPU Pro 2, 2011
4. Oliver Mattausch, Jiří Bittner, Ari Silvennoinen, Daniel Scherzer, Michael Wimmer  
Efficient Online Visibility for Shadow Maps  
In GPU Pro 3, 2012
5. Daniel Scherzer, Florian Bagar, Oliver Mattausch  
Volumetric Real-Time Water and Foam Rendering  
In GPU Pro 3, 2012
6. Rene Fürst, Oliver Mattausch, Daniel Scherzer  
Real-time Deep Shadow Maps  
In GPU Pro 4, 2013

## Books

1. Oliver Mattausch  
Visibility Algorithms for Real-Time Rendering  
Suedwestdeutscher Verlag fuer Hochschulschriften, Oct. 2010

## Talks at Conferences

1. Strategies for Interactive Exploration of 3D Flow Using Evenly-Spaced Illuminated Streamlines, SCCG, Apr. 2003, Budmerice, Slovakia
2. Practical reconstruction and hardware-accelerated direct volume rendering on body-centered cubic grids, CESCg, Apr. 2004, Budmerice, Slovakia
3. Adaptive Visibility-Driven View Cell Construction.  
Eurographics Workshop on Rendering, June 2006, Nicosia, Cyprus
4. Optimized Subdivisions for Preprocessed Visibility.  
Graphics Interface, May 2007, Montreal, Canada



5. CHC++: Coherent Hierarchical Culling Revisited, Eurographics, Apr. 2008, Crete
6. Adaptive Global Visibility Sampling, Siggraph, July 2009, New Orleans, USA
7. High-Quality Screen-Space Ambient Occlusion Using Temporal Coherence, Eurographics, Apr. 2011, Wales, Llandudno
8. A Survey on Temporal Coherence Methods in Real-Time Rendering, Eurographics, Apr. 2011, Wales, Llandudno
9. Tessellation-Independent Smooth Shadow Boundaries, Symposium on Rendering, Jun. 2012, Paris, France
10. Freeform Shadow Boundary Editing, Eurographics, Mai 2013, Girona, Spain
11. Object Detection and Classification from Large-Scale Cluttered Indoor Scans Eurographics, Apr. 2014, Strasbourg, France
12. CHC+RT: Coherent Hierarchical Culling for Ray Tracing Eurographics, Apr. 2015, Zurich, Switzerland
13. Monte-Carlo Ray-Tracing for Realistic Interactive Ultrasound Simulation, VMBC, Sep. 2016, Bergen, Norway
14. Image-based PSF Estimation for Ultrasound Training Simulation, SASHIMI, Oct. 2016, Athens, Greece

## Invited Talks

1. Adaptive Visibility-Driven View Cell Construction. Prague University of Technology, Prague, Dec. 2007
2. Visibility Computations in Real-Time Rendering, Disney Research (ETH), Zürich, June 2011
3. Freeform Shadow Boundary Editing University of Tokyo (Nishita Group), Tokyo, Nov. 2011
4. Freeform Shadow Boundary Editing OML, Tokyo, Dec. 2011
5. Object Detection and Classification from Large-Scale Cluttered Indoor Scans ETH (Interactive Geometry Lab), Zurich, March 2013
6. New Methods for Indoor Scan Processing and Online Reconstruction EPFL (Applied Geometry Group), Lausanne, March 2014
7. Robust Reconstruction for Online Scanning ETH (Vision Group), Zurich, July 2014

## Courses

1. Exploiting Temporal Coherence in Real-Time Rendering Siggraph Asia Courses, Dec. 2010, Seoul, South Korea

2. Industry course: Parallel and GPU programming  
Noser AG Course at University of Zurich, Jan. 2013, Zurich, Switzerland
3. Presentation at EXCITE Summer School in Biomedical Imaging 2015

*Oliver Mattausch, Feb. 2017, Vienna*