CURRICULUM VITAE

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Date of birth 1979-07-06
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Employment

2013 - now	**Assistant Professor** at the Technical University of Munich.
2010 - 2013	**Research & development lead** at ScanlineVFX. Research and development of novel simulation algorithms for special effects.
2007 - 2010	**Post-doctoral researcher at ETH Zurich,** Computer Graphics Laboratory of Prof. M. Gross. Research on novel control and detail preservation algorithms for fluid simulation.
2006 - 2007	**Post-doctoral researcher at AGEIA / ETH Zurich.** Work on real-time fluid simulations and liquid effects for computer games with M. Mueller and the AGEIA research group.
2003	**Visiting researcher.** Lawrence-Livermore National Laboratory, work on optimizing compilers for high-level C++ with Dr. D. Quinlan.
1999 - 2001	**Co-founder and lead developer** of online marketplace Wirescout.com.

Education

2003 - 2007	**Ph.D. in computer science (with honors),** University of Erlangen, Germany. Thesis on "Physically based Animation of Free Surface Flows with the Lattice Boltzmann Method".
1998 - 2003	**Study of computer science (Diplom ≈ M.Sc.),** University of Erlangen, Germany.
1985 - 1998	**Secondary school,** German International School the Hague, Netherlands.

Professional Activities

2007-8, 2013-15	**Symposium on Computer Animation** program committee member
2009, 2015	**Eurographics** program committee member
2013-14	**Pacific Graphics** program committee member
2013	**CGI** program committee member
2011-12	**SIGGRAPH** technical papers committee member
Journal reviews	ACM Transactions on Graphics, The Visual Computer, Trans. Vis. and Comp. Graphics, Computer Graphics Forum, Computers & Graphics, Computer Animation and Virtual Worlds, Computers and Fluids, Computers and Mathematics with Applications, SIAM J. Scientific Computing, NSERC Canada
Conference reviews	SIGGRAPH, Eurographics, IEEE Visualization, Symposium on Computer Animation, Pacific Graphics, Computer Graphics International, Vision Modeling and Visualization

Teaching & Tutorials

2015	**Game Development Laboratory**, practical lab-course at TU Muenchen
2014, 2015	**Simulation and Animation**, course at TU Muenchen
2013, 2014	**Game Physics**, Bachelor-level course at TU Muenchen
2012, 2013	**Turbulent Fluids**, tutorial at SIGGRAPH '12, Eurographics '13
2012	**Fluid simulation training,** lectures for artists at ScanlineVFX
2009, 2010	**Physically-based animation,** course at ETH Zurich
2008, 2009	**Advanced topics in computer graphics,** seminar at ETH Zurich
2007 - 2009	**Game programming laboratory**, course at ETH Zurich
2008	**Real-time physics**, tutorial at SIGGRAPH conference
2008	**LBM fluid simulations**, tutorial at IEEE VIS conference
2004 - 2006	**Numerical simulation of fluids**, exercise at University of Erlangen

Funding

ERC Starting Grant *realFlow*
Grant by the Research Council of the European Union. Funding: 1,465,625€, Duration: May 2015 - May 2020

High-speed Graphics: Modeling and Simulation
Samsung Global Research Outreach; funds acquired 100,000$. Duration Oct. 2014 - Oct. 2015

Mesh-based fluid control
Research internship at ScanlineVFX; total funds acquired 14,200$. Duration: May - July 2011

Data driven fluids
ETH research grant, funding of two PhD students for 3 years; total funds 256,300$. Duration: 2007 - 2010

Real-time fluid simulation for computer games
Research project with AGEIA, funding of a post-doc position; total funds 56,600$. Duration: 2006 - 2007

Patents

Real-time breaking waves for shallow water simulations, US patent 8204725 , 2012
N. Thuerey, M. Mueller-Fischer, S. Schirm, M. Gross

Two-way rigid body coupling in shallow water simulations, US patent 8041550 , 2011
N. Thuerey, M. Mueller-Fischer, S. Schirm, M. Gross

Visibility transition planning for dynamic camera control, US patent application 12/843827, 2010
R. Sumner, M. Gross, N. Thuerey, T. Oskam

Honors & Awards

- **Academy Award** (tech-Oscar) 2012 for development of the Wavelet Turbulence algorithm
- **Cover image** of the SIGGRAPH 2010 Technical Papers Proceedings.
- **Staedtler Graduation Award** for Phd-thesis 2008 (highest remunerated award of Uni. Erlangen).
- **Animation "Magic Fluid Control"** shown at SIGGRAPH CAF and international festivals.
- **Google Summer of Code** fellowship for "Integration of Fluid Simulations into Blender" in 2006.
- **Computer game** "N@T-Bomber" developed and commercialized in 1999.

Refereed Full Papers

[1] Ryoichi Ando, Nils Thuerey, and Chris Wojtan. A Stream Function Solver for Liquid Simulations. *ACM Transactions on Graphics (SIGGRAPH)*, 34 (4):8, Aug 2015.

[2] Ryoichi Ando, Nils Thuerey, and Chris Wojtan. A Dimension-reduced Pressure Solver for Liquid Simulations. *Computer Graphics Forum (Eurographics)*, 34 (2):10, May 2015.

[3] James Gregson, Nils Thuerey, Ivo Ihrke, and Wolfgang Heidrich. From Capture to Simulation - Connecting Forward and Inverse Problems in Fluids. *ACM Transactions on Graphics (SIGGRAPH)*, 33 (4):10, August 2014.

[4] Karthik Raveendran, Nils Thuerey, Chris Wojtan, and Greg Turk. Blending Liquids. *ACM Transactions on Graphics (SIGGRAPH)*, 33 (4):10, August 2014.

[5] Theodore Kim, Jerry Tessendorf, and Nils Thuerey. Closest-Point Turbulence for Liquid Surfaces. *ACM Transactions on Graphics*, 32 (2):10, April 2013.

[6] Tobias Pfaff, Nils Thuerey, and Markus Gross. Lagrangian Vortex Sheets for Animating Fluids. *ACM Transactions on Graphics (SIGGRAPH)*, 31 (4):8, August 2012.

[7] Ryoichi Ando, Nils Thuerey, and Reiji Tsuruno. Preserving Fluid Sheets with Adaptively Sampled Anisotropic Particles. *IEEE Transactions on Visualization and Computer Graphics*, 18 (8):1202–1214, November 2011.

[8] Tobias Pfaff, Nils Thuerey, Jonathan Cohen, Sarah Tariq, and Markus Gross. Scalable Fluid Simulation using Anisotropic Turbulence Particles. *ACM Transactions on Graphics (SIGGRAPH Asia)*, 29 (5):8, December 2010.

[9] Nils Thuerey, Chris Wojtan, Markus Gross, and Greg Turk. A Multiscale Approach to Mesh-based Surface Tension Flows. *ACM Transactions on Graphics (SIGGRAPH)*, 29 (4):10, July 2010.

[10] Chris Wojtan, Nils Thuerey, Markus Gross, and Greg Turk. Physics-Inspired Topology Changes for Thin Fluid Features. *ACM Transactions on Graphics (SIGGRAPH)*, 29 (4):8, July 2010.

[11] Tobias Pfaff, Nils Thuerey, Andrew Selle, and Markus Gross. Synthetic Turbulence using Artificial Boundary Layers. *ACM Transactions on Graphics (SIGGRAPH Asia)*, 28 (5):10, December 2009.

[12] Chris Wojtan, Nils Thuerey, Markus Gross, and Greg Turk. Deforming Meshes that Split and Merge. *ACM Transactions on Graphics (SIGGRAPH)*, 28 (3):9, August 2009.

[13] Nils Thuerey, Richard Keiser, Ulrich Ruede, and Mark Pauly. Detail-Preserving Fluid Control. *Graphical Models*, 71,6:221–228, November 2009.

[14] Theodore Kim, Nils Thuerey, Doug James, and Markus Gross. Wavelet Turbulence for Fluid Simulation. *ACM Transactions on Graphics (SIGGRAPH)*, 27 (3):6, August 2008.

[15] Roland Angst, Nils Thuerey, Mario Botsch, and Markus Gross. Robust and Efficient Wave Simulations on Deforming Meshes. *Computer Graphics Forum*, 27 (7):1895–1900, October 2008.

[16] Nils Thuerey and Ulrich Ruede. Stable free surface flows with the lattice Boltzmann method on adaptively coarsened grids. *Computing and Visualization in Science*, 12 (5), 2009.

[17] Klaus Iglberger, Nils Thuerey, and Ulrich Ruede. Simulation of moving particles in 3D with the Lattice Boltzmann method. *Computers and Mathematics with Applications, Mesoscopic Methods in Engineering and Science*, 55 (7):1461–1468, April 2008.

[18] Christian Binder, Christian Feichtinger, Hans-Joachim Schmid, Nils Thuerey, Wolfgang Peukert, and Ulrich Ruede. Simulation of the Hydrodynamic Drag of Aggregated Particles. *Journal of Colloid and Interface Science*, 301:155–167, 2006.

[19] Nils Thuerey, Thomas Pohl, Ulrich Ruede, Markus Oechsner, and Carolin Koerner. Optimization and Stabilization of LBM Free Surface Flow Simulations using Adaptive Parameterization. *Computers and Fluids*, 35 [8-9]:934–939, November 2006.

[20] Carolin Koerner, Michael Thies, Thomas Hofmann, Nils Thuerey, and Ulrich Ruede. Lattice Boltzmann Model for Free Surface Flow for Modeling Foaming. *Journal of Statistical Physics*, 121 [1-2]:179–196, 2005.

Refereed Conference Publications

[21] Karthik Raveendran, Nils Thuerey, Chris Wojtan, and Greg Turk. Controlling Fluids using Meshes. *SCA '12: Proceedings of the 2012 ACM SIGGRAPH/Eurographics Symposium on Computer Animation*, pages 1–8, July 2012.

[22] Thomas Oskam, Robert W. Sumner, Nils Thuerey, and Markus Gross. Visibility Transition Planning for Real-Time Camera Control. *SCA '09: Proceedings of the 2009 ACM SIGGRAPH/Eurographics Symposium on Computer Animation*, pages 55–65, August 2009.

[23] Robert Sumner, Nils Thuerey, and Markus Gross. The ETH Game Programming Laboratory: A Capstone for Computer Science and Visual Computing. *Game Development in Computer Science Education (GDCSE)*, 2008.

[24] Nils Thuerey, Thomas Pohl, and Ulrich Ruede. Hybrid Parallelization Techniques for Lattice Boltzmann Free Surface Flows. *Proceedings of Parallel CFD 2007*, pages 1–8, 2007.

[25] Nils Thuerey, Matthias Mueller-Fischer, Simon Schirm, and Markus Gross. Real-time Breaking Waves for Shallow Water Simulations. *Proceedings of the Pacific Conference on Computer Graphics and Applications 2007*, pages 39–46, October 2007.

[26] Nils Thuerey, Filip Sadlo, Simon Schirm, Matthias Mueller-Fischer, and Markus Gross. Real-time simulations of bubbles and foam within a shallow water framework. *SCA '07: Proceedings of the 2007 ACM SIGGRAPH/Eurographics Symposium on Computer Animation*, pages 191–198, July 2007.

[27] Nils Thuerey, Richard Keiser, Ulrich Ruede, and Mark Pauly. Detail-Preserving Fluid Control. *SCA '06: Proceedings of the 2006 ACM SIGGRAPH/Eurographics Symposium on Computer Animation*, pages 7–12, Jun 2006.

[28] Nils Thuerey, U. Ruede, and M. Stamminger. Animation of Open water Phenomena with coupled Shallow Water and Free Surface Simulation. *SCA '06: Proceedings of the 2006 ACM SIGGRAPH/Eurographics Symposium on Computer Animation*, pages 157–166, Jun 2006.

[29] Nils Thuerey, K. Iglberger, and U. Ruede. Free Surface Flows with Moving and Deforming Objects for LBM. *Proceedings of Vision, Modeling and Visualization 2006*, pages 193–200, Nov 2006.

[30] Yuan Zheng, Harald Koestler, Nils Thuerey, and Ulrich Ruede. Enhanced Motion Blur Calculation with Optical Flow. *Proceedings of Vision, Modeling and Visualization 2006*, pages 253–260, Nov 2006.

[31] Nils Thuerey and U. Ruede. Free Surface Lattice-Boltzmann fluid simulations with and without level sets. *Proc. of Vision, Modelling, and Visualization VMV*, pages 199–207, 2004.

[32] Thomas Pohl, Frank Deserno, Nils Thuerey, Ulrich Ruede, Peter Lammers, Gerhard Wellein, and Thomas Zeiser. Performance Evaluation of Parallel Large-Scale Lattice Boltzmann Applications on Three Supercomputing Architectures. *SC '04: Proceedings of the 2004 ACM/IEEE conference on Supercomputing*, page 21, 2004.

[33] Markus Kowarschik, Ulrich Ruede, Nils Thuerey, and Christian Weiss. Performance Optimization of 3D Multigrid on Hierarchical Memory Architectures. *Proceedings of PARA'02*, pages 307–318, 2002.

Books & Book Chapters

[34] Markus Gross, Robert Sumner, and Nils Thuerey. The Design and Development of Computer Games. *The Design of Material, Organism, and Minds (Editors: S. Lang, M. Hampe)*, ISBN 978-3-549-68995-9:14, February 2011.

[35] N. Thuerey. Physically based Animation of Free Surface Flows with the Lattice Boltzmann Method. *PhD thesis*, ISBN 978-3-89963-519-5, Mar 2007.

[36] Carolin Koerner, Thomas Pohl, Ulrich Ruede, Nils Thuerey, and Thomas Zeiser. Parallel Lattice Boltzmann Methods for CFD Applications. *Numerical Solution of Partial Differential Equations on Parallel Computers*, ISBN 3-540-29076-1:439–465, 2006.

Other

[37] Thomas Oskam, Robert Sumner, Nils Thuerey, and Markus Gross. Visibility transition planning for dynamic camera control. In *Motion in Games, Lecture Notes in Computer Science*, volume 6459, pages 325–335, 2010.

[38] Nils Thürey. Fluid Simulation with Blender. *Dr. Dobbs Journal*, January 2006.

[39] Klaus Iglberger, Nils Thürey, Ulrich Rüde, H.J. Schmid, and Wolfgang Peukert. Simulation of moving Nano-Particles with the Lattice Boltzmann method in 3D. In *18th Symposium ASIM 2005 Proceedings*, volume 15, pages 39–44. ASIM, SCS Publishing House, Sep 2005.

[40] Christian Feichtinger, Nils Thürey, Ulrich Rüde, C. Binder, H.J. Schmid, and Wolfgang Peukert. Drag Force Simulations of Particle Agglomerates with the Lattice Boltzmann Method. In *18th Symposium ASIM 2005 Proceedings*, volume 15, pages 45–50. ASIM, SCS Publishing House, Sep 2005.

[41] Nils Thürey, Ulrich Rüde, and Carolin Körner. Interactive Free Surface Fluids with the Lattice Boltzmann Method. Technical Report 05-4, Department of Computer Science 10, System Simulation, University of Erlangen-Nuremberg, 2005.

[42] Nils Thürey and Ulrich Rüde. Turbulent Free Surface Flows with the Lattice Boltzmann Method on Adaptively coarsened Grids. Technical Report 05-7, Department of Computer Science 10, System Simulation, University of Erlangen-Nuremberg, Dec 2005.

[43] Thomas Pohl, Nils Thürey, Frank Deserno, Ulrich Rüde, and Peter Lammers. Parallel Performance of Large-Scale Lattice Boltzmann Applications. Technical Report 04-2, Department of Computer Science 10, System Simulation, University of Erlangen-Nuremberg, May 2004.

[44] Nils Thürey, Thomas Pohl, Carolin Körner, and Ulrich Rüde. Simulation von Metallschaum mittels der Lattice-Boltzmann Methode. *Konwihr Quartl*, 35(2):4–8, 2003.

[45] Nils Thürey. A Lattice Boltzmann method for single-phase free surface flows in 3D. Masters thesis, Dept. of Computer Science 10 System-Simulation, University of Erlangen-Nuremberg, 2003.

[46] Nils Thürey. Cache Optimizations for Multigrid in 3D. Study Thesis, Institute for System Simulation, University of Erlangen-Nuremberg, Jun 2002.

Service

- Seminar *Recent Highlights in Graphics, Special Effects and Visualization*, 2014, 2015.
- Organisation of the booth for the computer graphics lab for the *TUM Open Door* event 2014
- *Struktur-Kommission der Informatik Fakultät* (Preparation of a structural plan for the CS faculty of TUM.)
- *Guest-professor selection committee* (Selection of candidates to be funded by a new program of the excellence initiative.)

Talks (Selection)

- 2015-04-10: Bavarian Graduate School Computational Engineering (*invited talk*), Starnberg, Germany
- 2015-04-02: UCL, London, UK
- 2015-03-30: INRIA Institut d'Optique, Bordeaux, France
- 2014-09-25: Graduiertenkolleg GRK 1773 (*invited talk*), Kloster Banz, Germany
- 2014-05-21: Werk1 (*invited talk*), Munich, Germany
- 2014-02-13: Samsung SRUK, London, UK
- 2013-09-27: UC Berkeley, Berkeley, USA
- 2013-09-20: Dreamworks, Los Angeles, USA
- 2013-08-27: University of Southern California, Los Angeles, USA
- 2013-07-25: XSEDE Conference (*plenary speaker*), San Diego, USA
- 2012-04-20: University College London, London, UK
- 2011-11-24: ETH Zurich, Zurich, Switzerland
- 2011-07-18: IST Austria, Vienna, Austria
- 2010-08-25: Caltech, Pasadena, USA
- 2009-12-16: Zurich Minds, Zurich, Switzerland
- 2009-08-11: Rhythm and Hues Studios, Los Angeles, USA
- 2009-04-01/08: Microsoft Tech-Days, Geneva & Bern, Switzerland
- 2005-10-27: Applied Geometry Group, ETH Zurich, Switzerland
- 2004-06-01: CAB, University of Braunschweig, Germany

Movie Contributions (Selection)

- Rise of an Empire (2014, Z. Snyder)
- Iron Man 3 (2013, S. Black)
- Super Man: Man of Steel (2013, Z. Snyder)
- Marvel's Avengers (2012, J. Whedon)
- Immortals (2011, T. Singh)
- Super 8 (2011, J. J. Abrams)
- Hereafter (2010, C. Eastwood).

Supervised Theses

[1] Dominik Baumeister. Efficient Multigrid Solves for Optical Flow. Bachelor Thesis, Games Engineering Lab, TU Muenchen. Mar. 2015.

[2] Katharina Brand. Stochastic Tomography for Flow Data. Bachelor Thesis, Games Engineering Lab, TU Muenchen. Mar. 2015.

[3] Dominik Hoffendahl. A Low-Cost Capturing Setup for Fluid Flows. Bachelor Thesis, Games Engineering Lab, TU Muenchen. Mar. 2015.

[4] Anselm Eickhoff. Interactive Shallow-Water Simulations with WebGL. Bachelor Thesis, Games Engineering Lab, TU Muenchen. Feb. 2015.

[5] Ben Jones. Animating Physical Phenmoena with Embedded Surface Meshes. Phd Thesis, SEA Lab, Utah ; co-supervision with G. Turk, Dec. 2010.

[6] Benjamin Grzimek. Shallow Water Simulations with Lagrangian Methods. Bachelor Thesis, Games Engineering Lab, TU Muenchen; Nov. 2014.

[7] Marie-Lena Eckert. Flexible Boundary Conditions for Fluid Solvers based on ADMM. Master Thesis, Games Engineering Lab, TU Muenchen; Nov. 2014.

[8] Roman Pogrbinyi. Design and Implementation of Fluid-Solvers into 3D Authoring Applications. Bachelor Thesis, Games Engineering Lab, TU Muenchen; co-supervision with Blender Foundation; Nov. 2014.

[9] Phillip Krueger. Fur Rendering and Dynamics for Mobile Devices. Bachelor Thesis, Games Engineering Lab, TU Muenchen; co-supervision with NEUE SUPER. Aug. 2014.

[10] Phillip Mueller. Dynamic Fracture with on-the-fly Convex Decomposition. Bachelor Thesis, Games Engineering Lab, TU Muenchen; Aug. 2014.

[11] Stefan Wenninger. Open-water Simulations with Dynamic Objects in Real-time. Master Thesis, Games Engineering Lab, TU Muenchen; co-supervision with Reality Twist.

[12] Karthik Raveendran. Mesh-based Simulations of Liquid Phenomena. Phd Thesis, Computer Graphics Lab, Georgia Institute of Technology; co-supervision with G. Turk and C. Wojtan, July 2014.

[13] Tobias Pfaff. Detail Enhancement for Fluid Simulations using Turbulence Modeling. Phd Thesis, Computer Graphics Laboratory, ETH Zurich; co-supervised with M. Gross and J. O'Brien, 2009-2012.

[14] Chris Wojtan. Animating Physical Phenmoena with Embedded Surface Meshes. Phd Thesis, Computer Graphics Lab, Georgia Institute of Technology; co-supervision with G. Turk, Dec. 2010.

[15] Andri Buehler. Extended Boundary Conditions for Model Reduced Fluids. Master Thesis, Computer Graphics Laboratory, ETH Zurich; co-supervised with M. Gross and M. Wicke, September 2008.

[16] Basil Fierz. Real-time Fluid Simulations with Wavelet Turbulence. Master Thesis, Computer Graphics Laboratory, ETH Zurich; co-supervised with M. Gross, August 2008.

[17] Rostislav Khlebnikov. Modelling and Rendering of Snowfall for Real-time Applications. Master Thesis, St. Petersburg State Technical University, Russia; co-supervised with B. Grigoriev, June 2008.

[18] Roni Oeschger. Hybrid Meshless and Mesh-Based Discretizations. Master Thesis, Computer Graphics Laboratory, ETH Zurich; co-supervised with M. Gross and M. Otaduy, Sept 2007.

[19] Roland Angst. Control Algorithms for Interactively Animated Fluid Characters. Master Thesis, Computer Graphics Laboratory, ETH Zurich; co-supervised with M. Gross, Sept 2007.

[20] Peter Hess. Extended Boundary Conditions for Shallow Water Simulations. Master Thesis, Computer Graphics Laboratory, ETH Zurich; co-supervised with M. Gross, Sept 2007.

[21] Christian Feichtinger. Simulation of Moving Charged Colloids with the Lattice Boltzmann Method. Master Thesis, Institute for System Simulation, University of Erlangen-Nuremberg; co-supervised with U. Ruede, Jun 2006.

[22] Zheng Yuanhang. Enhanced Motion Blur Calculation with Optical Flow. Master Thesis, Institute for System Simulation, University of Erlangen-Nuremberg; co-supervised with U. Ruede and H. Koestler, May 2006.

[23] Fabian Wein. Improved curvature calculation and surface reconstruction for free-surface fluid simulations. Master Thesis, Institute for System Simulation, University of Erlangen-Nuremberg; co-supervised with U. Ruede and M. Stamminger, May 2006.

[24] Dominik Geuss. Momentum calculation for particle agglomerate connections. Bachelor Thesis, Institute for System Simulation, University of Erlangen-Nuremberg; co-supervised with U. Ruede, Feb 2006.

[25] Klaus Iglberger. Lattice-Boltzmann Simulation of Flow around moving Particles. Master Thesis, Institute for System Simulation, University of Erlangen-Nuremberg; co-supervised with U. Ruede, Jun 2005.

[26] Christian Feichtinger. Drag Force Simulations of Particle Agglomerates with the Lattice-Boltzmann Method. Study Thesis, Institute for System Simulation, University of Erlangen-Nuremberg; co-supervised with U. Ruede, Jun 2005.