

Thomas Auzinger

Heinrich-Mitteis-Gasse 3 Haus 3 – 1210 Vienna – Austria

☎ +43 676 7131578 • ✉ thomas@auzinger.name

🌐 www.auzinger.name • 📞 +43 676 7131578

in thomasauzinger • 🆔 0000-0002-1546-3265

📧 thomasa_ • 🐙 ThomasAUZINGER

👤 ThomasAuzinger



Profile

Experienced researcher and project manager at the interface of world-class basic and applied research in computer science. Expert in computational design and fabrication with extensive track record of top-tier publications in leading journals. Software engineering experience both in professional and entrepreneurial environments. Effective technical communicator in international professional and public settings. Highly self-motivated and able to work effectively both in teams and independently.

Experience

Institute of Science and Technology Austria (ISTA)

Klosterneuburg, Austria

TWIST Fellow

2022.04–ongoing

- Managing participation of ISTA in the FFG research project ‘DiProK’.
- Developing novel computational tools for mold design.
- Integrating with digital process chain of academic and industrial collaborators.

AutoMold

Vienna, Austria

Head

2021.08–ongoing

- Leading entrepreneurial efforts in bringing automated design of molding tools to the market.
- Supervising day-to-day operations of core team.
- Assisting technological development.
- Managing use case studies with industrial stakeholders.
- Conducting market research and funding acquisition.

Parental Leave

2021.02–07

Institute of Science and Technology Austria (ISTA)

Klosterneuburg, Austria

TWIST Fellow

2021.01

- Evaluated entrepreneurial potential of the automated design of molding tools.
- Conducted market research with stakeholders along the value chain of mold-based production.
- Evaluated CAD kernel products.

Institute of Science and Technology Austria (ISTA)

Klosterneuburg, Austria

Postdoctoral Researcher

2015–2021

- Performed basic research in computational fabrication (e.g., computational design, physical simulation, additive manufacturing, ...) including project ideation, execution, academic publication, and public dissemination.
- Co-supervised doctoral students.
- Published several articles in the world-leading journal on computer graphics (ACM ToG).
- Evaluated patentability of basic research results and assisted in patenting.
- Acquired EU funding for industrial proof-of-concept development (ERC PoC, TWIST Fellowship).
- Developed industrial proof-of-concept for the automated design of molding tools.

- TU Wien** **Vienna, Austria**
Doctoral Researcher *2010–2015*
- Performed basic research in computer graphics (e.g., rendering, antialiasing, visualization, ...) including conception of research topics, mathematical investigation, prototype development, and presentation both in articles and at conferences.
 - Proposed and managed research project including funding acquisition, team supervision, and reporting.
 - Co-supervised bachelor and master students.
 - Taught bachelor- and master-level courses.

- Austrian Institute of Technology (AIT)** **Seibersdorf, Austria**
Software Engineer *2001–2009*
- Developed custom software solutions for the *Health Physics Group* including data analysis tools of optical measurement, measurement data management systems, and measurement hardware control systems.
 - Created documentation and provided training for team members.
 - Assisted in the requirement analysis for measurement and certification projects.

Education

- TU Wien** **Vienna, Austria**
Dr. techn. (PhD) in Computer Science, Distinction *2015*
 Thesis: Sampled and prefiltered anti-aliasing on parallel hardware
 Advisor: Michael Wimmer

- University of Vienna** **Vienna, Austria**
MSc in Physics, Highest Distinction *2010*
 Thesis: Rotating Bose-Einstein condensates in partially anisotropic traps
 Advisor: Jakob Yngvason

- University of Vienna** **Vienna, Austria**
BSc in Physics, Highest Distinction *2009*
-

- Ludwig Boltzmann Society (LBG)** **Vienna, Austria**
Innovator's Road Program *2019–2020*
 Support program for academic founders

- I.E.C.T. – Hermann Hauser** **Wattens, Austria**
Summer School on Entrepreneurship *2019*

- KAUST** **Thuwal, Saudi Arabia**
Several Research Visits *2016–2018*
 Computational Imaging Group, Prof. Wolfgang Heidrich

- The University of Tokyo** **Tokyo, Japan**
Research Visit *2015*
 User Interface Research Group, Prof. Takeo Igarashi

- Barcelona Supercomputing Center** **Barcelona, Spain**
Course on GPGPU *2013*
 PUMPS Summer School

- i²c innovation incubation center, TU Wien** **Vienna, Austria**
Diploma Supplement on Innovation *2013*
 Multi-semester curriculum on innovation and entrepreneurship

Skills

Concepts.....

- Project Management
- Basic and Applied Research
- Physical Simulation (EM, mechanical, ...)
- Computational Geometry
- CAD
- Parallel Computing and GPGPU
- Additive Manufacturing
- Computer Science
- Entrepreneurship
- Mathematical Optimization
- Computational Design
- Rendering and Anti-aliasing
- Mold Design and Mold-based Manufacturing
- Neurosurgical Planning

Technologies and Tools.....

Frameworks (selection): CUDA, OpenCV, OpenGL/DirectX, Open Cascade, Parasolid, MEEP, Gurobi, VTK/ITK, Qt, NodeJS, Docker, ...

Languages (selection): C/C++, C#/VB.NET, Python, Javascript, MATLAB, Mathematica, SQL, PHP, Lua, ...

Programs (selection): MS Office, Adobe Creative Suite, Mathematica, MATLAB, CAD, Git/SVN, GitLab/Github, L^AT_EX, ...

Awards

Frontier Partnership

Siemens Digital Industries Software 2021
Partnership program for early-stage startups. Program start with the future foundation of company.

Innovation Prize (1st place)

Lower Austrian Economic Chambers 2020
Innovation prize for companies and research institutions (category: Research)

rizup GENIUS (1st place)

rizup – Lower Austria’s Agency for Founders 2020
Ideas and start-up award (category: R&D)

Innovator’s Road Scholarship

Ludwig Boltzmann Society (LBG) 2019
Fully paid participation in the Innovator’s Road program

I.E.C.T. Scholarship

Ludwig Boltzmann Society (LBG) 2019
Fully paid participation at the I.E.C.T. Summer School

Science and Business Award – Finalist

Rudolf Sallinger Fonds 2019
Award for research-based commercialization ideas

Funding

DiProK

Austrian Research Promotion Agency (FFG), Host: ISTA 90k€ 2021
Applied research project on digital process chains in plastic manufacturing. Co-application with Business Upper Austria. Approved: 2021.09.

TWIST Fellowship

TWIST - Technology Transfer, Host: ISTA 75k€ 2020
Funding for the initial spin-out efforts for AutoMold. Approved: 2020.11

Proof of Concept (ERC PoC) **150k€**
European Research Council, Host: ISTA *2019*
 Funding for the development of an industrial prototype for automated mold design. Co-application with Bernd Bickel (Principal Investigator of the required ERC Starting Grant). Approved: 2018.12

Industrial Collaborations

Haidlmair GmbH **Nußbach, Austria**
Research and development collaboration *2021–*
 With Thomas Lichtenwöhrer and Harald Kaller (Haidlmair) and Ruslan Guseinov (IST Austria)

Robert Hofmann GmbH **Lichtenfels, Germany**
Research and development collaboration *2020–*
 With Frank Bischoff (Hofmann) and Ruslan Guseinov (IST Austria)

Microsoft Corporation **Beijing, China**
Research collaboration *2018–2019*
 With Yang Liu, Yizhong Zhang (Microsoft Research Asia) and Bernd Bickel, Ran Zhang (IST Austria)

HARATECH GmbH **Linz, Austria**
Research and development collaboration *2017–*
 With Manfred Haiberger (HARATECH) and Bernd Bickel (IST Austria)

Adobe Inc. **Seattle, USA**
Research collaboration *2015–2017*
 With Wilmot Li, Duygu Ceylan (Adobe Research) and Bernd Bickel, Ran Zhang (IST Austria)

DePuy Synthes Companies **Oberdorf, Switzerland**
Research collaboration *2015–2017*
 With Robert Schoutens (DePuy Synthes) and Philippe Dodier (Medical University Vienna)

Teaching

Lecturer.....

Introduction to Data Science and Scientific Computing, *IST Austria* *2017–2020*
 Lecture unit on scientific and information visualization

Computational Fabrication of Structural Color, *42nd MNE Conference* *2016*
 Short course

Rendering, *TU Wien* *2015*
 Core course on rendering together with Karoly Zsolnai

General Purpose Programming on GPUs, *University of Informatic Sciences, Cuba* *2014*
 Summer school lecture

Seminar on Computer Graphics, *TU Wien* *2010–2014*
 Seminar for bachelor and master students

Mentored Students.....

Aleksandar Vucenovic, *Bachelor Student, TU Wien* *2021–2022*
 Advisor: Eduard Gröller

Philipp Hochhauser, *Bachelor Student, TU Wien* *2020*
 Advisor: Eduard Gröller

Joachim Klein, *PhD Student, KAUST* *2019*
 Advisor: Wolfgang Heidrich

Hannes Kohlmann, *Master Student, TU Wien* *2018–2019*
 Advisor: Wolfgang Schulz (OVE-ALDIS)

Philippe Dodier, *PhD Student, Medical University of Vienna* *2018–2021*
 Advisor: Gerhard Bavinski

Kazutaka Nakashima, <i>PhD Student, University of Tokyo</i> Advisor: Takeo Igarashi	2017–2019
Ran Zhang, <i>PhD Student, IST Austria</i> Advisor: Bernd Bickel	2015–2020
Hiroyuki Sakai, <i>PhD Student, TU Wien</i> Advisor: Michael Wimmer	2015–2019
Matthias Gusenbauer, <i>Bachelor Student, TU Wien</i> Advisor: Michael Wimmer	2015
Bernhard Langer, <i>Bachelor Student, TU Wien</i> Advisor: Michael Wimmer	2013–2014
Alex Druml, <i>Master Student, TU Wien</i> Advisor: Michael Wimmer	2012–2013
Clemens Rögner, <i>Bachelor Student, TU Wien</i> Advisor: Michael Wimmer	2012

Invited Talks

Business Upper Austria <i>Automated mold design in digital process chains, Invited Symposium Talk</i>	virtual 2022.04
ecoplus Plastics Cluster <i>Automated mold design for additive tooling, Invited Symposium Talk</i>	virtual 2020.08
ecoplus Plastics Cluster <i>Automated mold design for small-series production, Invited Board Meeting Talk</i>	Traiskirchen, Austria 2020.08
University College London <i>Exact anti-aliasing and approximate shape optimization, Invited Talk</i>	London, United Kingdom 2015.11
The University of Tokyo <i>A physicist embracing computer graphics, Invited Talk</i>	Tokyo, Japan 2015.07
IST Austria <i>Prefiltered anti-aliasing on parallel hardware, Invited Talk</i>	Klosterneuburg, Austria 2015.04
University of Jaén <i>GPGPU in graphics and visualization, Invited Talk</i>	Jaén, Spain 2014.10
Czech Technical University in Prague <i>Analytic Rasterization, Invited Talk</i>	Pargue, Czech Republic 2014.04

Activities

Organizer

- Co-organizer, Symposium on Computational Fabrication, 2016
- Organizer, Russian-Austrian Bilateral Scientific Seminar on Visual Computing, 2011

Programm Committee

- Eurographics – Short Papers 2020
- ACM/Eurographics Symposium on Computer Animation (SCA) 2019
- NICOGRAPH 2019
- Pacific Graphics 2016
- ACM SIGGRAPH Asia – Technical Briefs and Posters 2015, 2016

Reviewer

Journals: ACM Transactions on Graphics, IEEE Transactions on Visualization and Computer Graphics, Computer Graphics Forum, The Visual Computer Journal (TV CJ), IEEE Transactions on Circuits and Systems II

Conferences: ACM SIGGRAPH, ACM SIGGRAPH Asia, Eurographics, Symposium on Computer Animation (SCA), Pacific Graphics, High Performance Graphics (HPG), Computer Graphics International (CGI), Graphics Interface (GI), Computer Graphics Theory and Applications (GRAPP), Eurographics Symposium on Parallel Graphics and Visualization (EGPGV), International Conference on System Theory, Control and Computing (ICSTCC), Brazilian Symposium on Computer Graphics and Image Processing (SIBGRAPI), Afrigraph

Miscellaneous

Theses Template

Creator and Maintainer, gitlab.com/ThomasAUZINGER/istaustriathesis

The `istaustriathesis` document class is a LaTeX2e-based template for theses written at IST Austria.

IST Austria

2020–

Expert Counsel

IP Implications of the Development of 3D Printing (DOI 10.2873/85090)

Published by the European Commission, Lead: Dinusha Mendis

Brussels, Belgium

2018–2019

Theses Template

Creator and Maintainer, gitlab.com/ThomasAUZINGER/vutinfth

The `vutinfth` document class is a LaTeX2e-based template for all theses written at the Faculty of Informatics at the Vienna University of Technology.

TU Wien

2014–

Languages

German: Native

English: C2

Spanish: B2

Publications

Journals

- [1] Ran Zhang, Thomas Auzinger, and Bernd Bickel. Computational design of planar multistable compliant structures. *ACM Transactions on Graphics*, 2021. (Presented at Siggraph Asia 2021).
- [2] Philippe Dodier, Thomas Auzinger, Gabriel Mistelbauer, Wei-Te Wang, Heber Ferraz-Leite, Andreas Gruber, Wolfgang Marik, Fabian Winter, Gerrit Fischer, Josa M. Frischer, and Gerhard Bavinzski. Novel software-derived workflow in extracranial-intracranial bypass surgery validated by transdural indocyanine green videoangiography. *World Neurosurgery*, 134:e892–e902, feb 2020.
- [3] Philippe Dodier, Fabian Winter, Thomas Auzinger, Gabriel Mistelbauer, Josa M. Frischer, Wei-Te Wang, Ammar Mallouhi, Wolfgang Marik, Stefan Wolfsberger, Lukas Reissig, Firas Hammadi, Christian Matula, Arnulf Baumann, and Gerhard Bavinzski. Single-stage bone resection and cranioplastic reconstruction: comparison of a novel software-derived PEEK workflow with the standard reconstructive method. *International Journal of Oral and Maxillofacial Surgery*, dec 2019.
- [4] Christian Hafner, Christian Schumacher, Espen Knoop, Thomas Auzinger, Bernd Bickel, and Moritz Bächer. X-CAD: Optimizing cad models with extended finite elements. *ACM Transactions on Graphics*, 38(6):157:1–157:15, nov 2019. (Presented at Siggraph Asia 2019).
- [5] Thomas Auzinger, Wolfgang Heidrich, and Bernd Bickel. Computational design of nanostructural color for additive manufacturing. *ACM Transactions on Graphics*, 37(4):159:1–159:16, 7 2018. (Presented at Siggraph 2018).
- [6] Philippe Dodier, Josa M. Frischer, Wei-Te Wang, Thomas Auzinger, Ammar Mallouhi, Wolfgang Serles, Andreas Gruber, Engelbert Knosp, and Gerhard Bavinzski. Immediate flow disruption as a prognostic factor after flow diverter treatment: Long-term experience with the pipeline embolization device. *World Neurosurgery*, 113:e568–e578, 5 2018.
- [7] Kazutaka Nakashima, Thomas Auzinger, Emmanuel Iarussi, Ran Zhang, Takeo Igarashi, and Bernd Bickel. Corecavity: Interactive shell decomposition for fabrication with two-piece rigid molds. *ACM Transactions on Graphics*, 37(4):135:1–135:13, 7 2018. (Presented at Siggraph 2018).
- [8] Ran Zhang, Thomas Auzinger, Duygu Ceylan, Wilmot Li, and Bernd Bickel. Functionality-aware retargeting of mechanisms to 3d shapes. *ACM Transactions on Graphics*, 36(4):81:1–81:13, 7 2017. (Presented at Siggraph 2017).
- [9] María del Carmen Calatrava Moreno, Thomas Auzinger, and Hannes Werthner. On the uncertainty of interdisciplinarity measurements due to incomplete bibliographic data. *Scientometrics*, 107(1):213–232, feb 2016.
- [10] Martin Ilčík, Przemyslaw Musialski, Thomas Auzinger, and Michael Wimmer. Layer-based procedural design of façades. *Computer Graphics Forum*, 34(2):205–216, 5 2015. (Presented at Eurographics 2015).
- [11] Jorge Jimenez, Károly Zsolnai, Adrian Jarabo, Christian Freude, Thomas Auzinger, Xian-Chun Wu, Javier von der Pahlen, Michael Wimmer, and Diego Gutierrez. Separable subsurface scattering. *Computer Graphics Forum*, 34(6):188–197, 2 2015. (Presented at EGSR 2015).
- [12] Alexey Karimov, Gabriel Mistelbauer, Thomas Auzinger, and Stefan Bruckner. Guided volume editing based on histogram dissimilarity. *Computer Graphics Forum*, 34(3):91–100, 6 2015. (Presented at Eurovis 2015).
- [13] Przemyslaw Musialski, Thomas Auzinger, Michael Birsak, Michael Wimmer, and Leif Kobbelt. Reduced-order shape optimization using offset surfaces. *ACM Transactions on Graphics*, 34(4):102:1–102:9, 7 2015. (Presented at Siggraph 2015).

- [14] Paul Guerrero, Thomas Auzinger, Michael Wimmer, and Stefan Jeschke. Partial shape matching using transformation parameter similarity. *Computer Graphics Forum*, 34(1):239–252, 11 2014.
- [15] Thomas Auzinger, Gabriel Mistelbauer, Ivan Baclija, Rudiger Schernthaner, Arnold Kochl, Michael Wimmer, M. Eduard Groller, and Stefan Bruckner. Vessel visualization using curved surface reformation. *IEEE Transactions on Visualization and Computer Graphics*, 19(12):2858–2867, 12 2013. (Presented at Scivis 2013).
- [16] Thomas Auzinger, Michael Wimmer, and Stefan Jeschke. Analytic visibility on the GPU. *Computer Graphics Forum*, 32(2pt4):409–418, 5 2013. (Presented at Eurographics 2013).
- [17] Thomas Auzinger, Michael Guthe, and Stefan Jeschke. Analytic anti-aliasing of linear functions on polytopes. *Computer Graphics Forum*, 31(2pt1):335–344, 5 2012. (Presented at Eurographics 2012).

Peer-reviewed Conferences.....

- [18] Johanna Schmidt, Reinhold Preiner, Thomas Auzinger, Michael Wimmer, M. Eduard Groller, and Stefan Bruckner. YMCA – your mesh comparison application. In *2014 IEEE Conference on Visual Analytics Science and Technology*, pages 153–162. IEEE, 10 2014.
- [19] Thomas Auzinger, Przemyslaw Musialski, Reinhold Preiner, and Michael Wimmer. Non-sampled anti-aliasing. In *18th International Workshop on Vision, Modeling and Visualization*, pages 169–176. The Eurographics Association, 9 2013.
- [20] Maria del Carmen Calatrava Moreno and Thomas Auzinger. General-purpose graphics processing units in service-oriented architectures. In *2013 IEEE 6th International Conference on Service-Oriented Computing and Applications*, pages 260–267. IEEE, 12 2013.

Peer-reviewed Posters.....

- [21] Christian Hafner, Przemyslaw Musialski, Thomas Auzinger, Michael Wimmer, and Leif Kobbelt. Optimization of natural frequencies for fabrication-aware shape modeling. In *ACM SIGGRAPH 2015 Posters*, number 82. ACM Press, 8 2015.
- [22] Thomas Auzinger. Analytic rasterization on GPGPUs. In *PUMPS Summer School Posters*, 2013. (Best poster award).
- [23] Thomas Auzinger and Michael Wimmer. Sampled and analytic rasterization. In *18th International Workshop on Vision, Modeling and Visualization*, pages 223–224. The Eurographics Association, 2013.
- [24] Thomas Auzinger, Ralf Habel, Andreas Musilek, Dieter Hainz, and Michael Wimmer. GeigerCam. In *ACM SIGGRAPH 2012 Posters*, number 40. ACM Press, 8 2012.

Patents.....

- [25] Thomas Auzinger and Philippe Dodier. Method of designing a skull prosthesis, and navigation system, 9 2018. WO/2020/064133, EP/3857562.
- [26] Kazutaka Nakashima, Thomas Auzinger, Emmanuel Iarussi, Ran Zhang, Takeo Igarashi, and Bernd Bickel. Method for computationally designing a re-usable two-piece mold, 7 2018. WO/2019/241818, EP/3810389, US/2021/0187791.

Theses.....

- [27] Thomas Auzinger. Sampled and prefiltered anti-aliasing on parallel hardware, 2015.
- [28] Thomas Auzinger. Rotating bose-einstein condensates in partially anisotropic traps, 2010.

Technical Reports.....

- [29] Alexey Karimov, Gabriel Mistelbauer, Thomas Auzinger, and Eduard Gröller. Statistics-driven localization of dissimilarities in data. techreport TR-186-2-16-1, TU Wien, 2016.