



## education

### phd | computer science

graz university of technology | 2018 - present

- research: real-time rendering for virtual reality
- advisor: Markus Steinberger

### msc | information and computer engineering

graz university of technology | 2018

- thesis: data augmentation in deep learning using generative adversarial networks 🐼
- gpa: 3.82
- major: signal processing
- minor: computer graphics & vision
- graduated with high distinction
- 2016 scholarship for academic excellence

### bsc | information and computer engineering

graz university of technology | 2015

- thesis: bugtracer: a buffer overflow and memory access logging tool
- gpa: 3.62
- graduated with high distinction
- 2013 scholarship for academic excellence
- 2015 scholarship for academic excellence

## coursework

### computer graphics & vision

machine learning  
computer vision  
computer graphics  
real-time graphics  
virtual reality  
augmented reality  
deep learning  
medical image analysis

### signal processing

adaptive filters  
digital audio engineering  
signal processors  
cognitive neuroscience  
brain-computer interfaces  
signal analysis  
speech communication

## work

### graz university of technology | university assistant

2019 - present

- investigating and improving methods for real-time rendering in computer graphics using alternative shading spaces (texture space, neural) to improve performance and quality for streaming and virtual reality

### graz university of technology | research assistant

2018 - 2019

- investigating and improving methods for real-time rendering in computer graphics using alternative shading spaces (texture space, neural) to improve performance and quality for streaming and virtual reality

### facebook reality labs | internship offer

2020

- canceled due to the COVID-19 pandemic

### graz university of technology | medical image analysis & deep learning

summer 2016 - spring 2018

- explored generative adversarial networks and their use for data augmentation in master's thesis
- several publications using deep learning methods for medical image analysis, using caffe and tensorflow
- research internship in summer 2016

### graz university of technology | study assistant

fall 2013 - spring 2018

- study assistant responsible for reference solutions of exercises, grading of exercises and holding tutorials for various bs- and ms-level courses, with 20-100 students
- introduction to programming, software development practicals, signal processors lab, medical image analysis

## teaching

### graz university of technology | university assistant

2019 - present

- computer graphics 1 (600+ students), computer graphics 2 (200+ students), virtual reality (20+ students), real-time graphics (20+ students), introduction to scientific work (15+ students)
- management of practicals, supervising study assistants, submission system, reference solutions, exams, grading

### graz university of technology | research assistant

fall 2018 - spring 2019

- introduction to scientific work, 6 students
- grading seminar papers and presentation for topics in machine learning in graphics

### graz university of technology | study assistant

fall 2013 - 2018

- introduction to programming, software development practicals (80+ students)
- reference solutions, assignment creation, grading and tutorial lectures

### graz university of technology | study assistant

2017

- medical image analysis (15+ students)
- reference solutions, assignment creation, tutorial sessions

### graz university of technology | study assistant

2017

- signal processors lab (15+ students)
- lab sessions, grading

## reviewing

SIGGRAPH Asia 2021

## invited talks

Huawei Cloud InnovWave Conference 2021 | DOnERF: Towards Real-Time Rendering of Compact Neural Radiance Fields using Depth Oracle Networks

## skills

### programming

experienced

c++ • c • c# •

proficient

python

familiar

cuda • objective-c • lua • java

• matlab

### computer graphics

apis

vulkan • opengl

engines

unity • unreal engine 4

### machine learning

frameworks

pytorch • tensorflow • caffe

methods

neural representations • cnns

• generative models •

segmentation

### general

languages

german • english • japanese

(basics)

software

LaTeX • photoshop

os

windows • linux

ides

visual studio • intellij

## projects (non-research)

greeney's run (pebble timeline challenge 2015 winner) </>

vision-based real-time load detection tools for "Crash Bandicoot: N. Sane Trilogy", "Crash Team Racing: Nitro Fueled" and "Crash Bandicoot 4: It's About Time" </> </> </>

reverse engineering of "Megaman Battle Network 3" and modifying the game into a roguelite experience </>

reverse engineering of "Dragon Ball Z: Legendary Super Warriors" and modifying the game to randomize certain aspects </>

reverse engineering of "Yu-Gi-Oh: Legacy of the Duelist" to implement custom card sets for the game's draft mode </>

development of several smaller games in unity/c#/objective-c </>

## publications

- 2021 Mueller, Joerg H., **Neff, Thomas**, Philip Voglreiter, Markus Steinberger, and Dieter Schmalstieg. "Temporally Adaptive Shading Reuse for Real-Time Rendering and Virtual Reality". In: *ACM Trans. Graph.* 40.2. issn: 0730-0301. doi: 10.1145/3446790. url: <https://doi.org/10.1145/3446790>.
- Neff, Thomas**, Pascal Stadlbauer, Mathias Parger, Andreas Kurz, Joerg H. Mueller, Chakravarty R. Alla Chaitanya, Anton S. Kaplanyan, and Markus Steinberger. "DOnERF: Towards Real-Time Rendering of Compact Neural Radiance Fields using Depth Oracle Networks". In: *Computer Graphics Forum* 40.4. issn: 1467-8659. doi: 10.1111/cgf.14340. url: <https://doi.org/10.1111/cgf.14340>.
- 2019 Mueller, Joerg H., **Neff, Thomas**, Philip Voglreiter, Mina Makar, Markus Steinberger, and Dieter Schmalstieg. "Shading Atlas Streaming Demonstration". In: *ACM SIGGRAPH 2019 Emerging Technologies*. SIGGRAPH '19. Los Angeles, California: ACM, 22:1–22:2. isbn: 978-1-4503-6308-2. doi: 10.1145/3305367.3327981. url: <http://doi.acm.org/10.1145/3305367.3327981>.
- 2018 Mueller, Joerg H., Philip Voglreiter, Mark Dokter, **Neff, Thomas**, Mina Makar, Markus Steinberger, and Dieter Schmalstieg. "Shading Atlas Streaming". In: *ACM Transactions on Graphics* 37.6. doi: 10.1145/3272127.3275087.
- Mueller, Joerg H., Philip Voglreiter, Mark Dokter, **Neff, Thomas**, Mina Makar, Markus Steinberger, and Dieter Schmalstieg. "Shading Atlas Streaming Demonstration". In: *Adjunct Proceedings of the IEEE International Symposium for Mixed and Augmented Reality 2018*.
- Payer, Christian, Darko Štern, **Neff, Thomas**, Horst Bischof, and Martin Urschler. "Instance segmentation and tracking with cosine embeddings and recurrent hourglass networks". In: *Medical Image Computing and Computer Assisted Intervention – MICCAI 2018 - 21st International Conference, 2018, Proceedings*. Lecture Notes in Computer Science. Springer Verlag Heidelberg, pp. 3–11. isbn: 9783030009335. doi: 10.1007/978-3-030-00934-2\_1.
- Neff, Thomas**, Christian Payer, Darko Stern, and Martin Urschler. "Generative Adversarial Networks to Synthetically Augment Data for Deep Learning based Image Segmentation". In: *Proceedings of the OAGM Workshop 2018*. Ed. by Martin Welk, Peter M. Roth, and Martin Urschler. Verlag der Technischen Universität Graz, pp. 22–29. doi: 10.3217/978-3-85125-603-1-07. url: <https://diglib.tugraz.at/download.php?id=5b3619809d758&location=browse>.
- 2017 Payer, Christian, **Neff, Thomas**, Horst Bischof, Martin Urschler, and Darko Stern. "Simultaneous Multi-Person Detection and Single-Person Pose Estimation With a Single Heatmap Regression Network". In: *ICCV 2017 PoseTrack Challenge: Human Pose Estimation and Tracking in the Wild*. Venice, Italy. url: <https://posetrack.net/workshops/iccv2017/pdfs/ICG.pdf>.
- \* **Neff, Thomas**, Christian Payer, Darko Stern, and Martin Urschler. "Generative Adversarial Network based Synthesis for Supervised Medical Image Segmentation". In: *Proceedings of the OAGM&ARW Joint Workshop*, pp. 140–145. doi: 10.3217/978-3-85125-524-9-30. url: [http://castor.tugraz.at/doku/OAGM-ARWorkshop2017/oagm-arw-17\\_paper\\_30.pdf](http://castor.tugraz.at/doku/OAGM-ARWorkshop2017/oagm-arw-17_paper_30.pdf).

\* Best Paper Award

## awards

- SIGGRAPH emerging technologies best in show nominee 2019
- oagm best paper award 2017
- pebble timeline challenge winner 2015
- 3rd place invent a chip challenge 2011