Thomas Neff

thomas.neff@icg.tugraz.at
thomasneff
thomasneff.github.io

education

phd | computer science
graz university of technology | 2018 - 2023
- thesis: alternative shading spaces for streaming and real-time rendering
- 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 - 2023
- 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

meta reality labs | research scientist intern
june 2022 - september 2022
- researching novel real-time computer graphics algorithms in the graphics team

facebook reality labs | internship offer
2020
- canceled due to the COVID-19 pandemic

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

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 (800+ students), virtual reality (20+ students), real-time graphics (100+ 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, 2022
SIGGRAPH • 2022
Transactions on Graphics • 2022
Computer Graphics Forum • 2022

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# • python
proficient
lua
familiar
cuda • objective-c • java • matlab

computer graphics
apis
vulkan • opengl • dx12
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

2022 †Kurz, Andreas, **Neff, Thomas**, Zhaoyang Lv, Michael Zollhöfer, and Markus Steinberger (2022). "AdaNeRF: Adaptive Sampling for Real-time Rendering of Neural Radiance Fields". In: *Computer Vision – ECCV 2022*. Cham: Springer Nature Switzerland, pp. 254–270. isbn: 978-3-031-19790-1. url: https://www.ecva.net/papers/eccv_2022/papers_ECCV/html/6513_ECCV_2022_paper.php.

Neff, Thomas, Joerg H. Mueller, Markus Steinberger, and Dieter Schmalstieg (2022). "Meshlets and How to Shade Them: A Study on Texture-Space Shading". In: *Computer Graphics Forum* 41.2, pp. 277–287. doi: https://doi.org/10.1111/cgf.14474. eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1111/cgf.14474. url: https://onlinelibrary.wiley.com/doi/abs/10.1111/cgf.14474.

2021 Mueller, Joerg H., **Neff, Thomas**, Philip Voglreiter, Markus Steinberger, and Dieter Schmalstieg (Apr. 2021). "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 (2021). "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 (2019). "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 (Nov. 2018a). "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 (2018b). "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 (Sept. 2018). "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 (May 2018). "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 (Oct. 2017). "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 (May 2017). "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-ARWWorkshop2017/oagm-arw-17_paper_30.pdf.

* Best Paper Award
†First two authors contributed equally.

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