Thomas Neff

I have had my results for a long time: but I do not yet know how I am to arrive at them - Carl Friedrich Gauss

Education

2018–2021 **PhD**, *Graz University of Technology*, Graz.
Computer Science

2015–2018 **Master of Science**, *Graz University of Technology*, Graz, *(with distinction)*.
Information and Computer Engineering
Major: Signal Processing and Speech Communication
Minor: Computer Vision and Graphics
- Scholarship for academic excellence 2015/2016

2012–2015 **Bachelor of Science**, *Graz University of Technology*, Graz, *with distinction*.
Information and Computer Engineering (Telematik)

- Scholarship for academic excellence 2012/2013
- Scholarship for academic excellence 2014/2015

2007–2012 **Higher School Certificate (Matura)**, *HTBL u. VA BULME*, Graz, *with distinction*.
Hardware - Software - Co-Design with focus on Software Development. Diploma thesis on the topic of digital signal processing for audio synthesis on ARM microcontrollers.

Master's thesis

title *Data Augmentation using Generative Adversarial Networks*
supervisor Univ.-Prof. Dipl.-Ing. Dr.techn. Horst Bischof
advisor Dipl.-Ing. Dr.techn. Martin Urschler
description Comparison of conventional deep learning data augmentation methods to Generative Adversarial Network based data augmentation, in the context of image segmentation.

Bachelor's thesis

title *BugTracer: A Buffer Overflow and Memory Access Logging Tool*
supervisors Dipl.-Ing. Johannes Winter

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description Buffer Overflow detection and visualization for C programs using LLVM compile passes, a run-time C library and a Python GDB script.

Experience

Vocational

06/2018– **PhD Student, Project Staff**, *Graz University of Technology, Institute of Computer Graphics and Vision*, Graz.
Research on rendering methods for virtual reality, based on our split-rendering "Shading Atlas Streaming" pipeline.

03/2018–06/2018 **Project Staff**, *Graz University of Technology, Institute of Computer Graphics and Vision*, Graz.
Assisting with software development of a virtual reality streaming project called "Shading Atlas Streaming". I was mainly responsible for the Vulkan-based Android client, running on a Snapdragon 835-based HMD.

10/2017–03/2018 **Student Employee**, *Graz University of Technology, Institute of Computer Graphics and Vision*, Graz.
I was employed for 8 hours a week to work on my master's thesis, which focused on the topic of Generative Adversarial Networks in the context of data augmentation in deep learning.

2017 **Study Assistant**, *Graz University of Technology, Institute of Computer Graphics and Vision*, Graz.
Tutorials, assignment solutions, mentoring during exercises.

- Medical Image Analysis, Practicals

2017 **Study Assistant**, *Graz University of Technology, Institute of Technical Informatics*, Graz.
Tutorials and mentoring the DSP lab assignments for small groups.

- Signal Processors, Laboratory

2013–2017 **Study Assistant**, *Graz University of Technology, Institute for Interactive Systems and Data Science* , Graz.
Tutorials, assignment creation and correction for introductory courses in C and C++ programming for groups between 40 and 80 students. I was also partly responsible for the planning, revision and organisation of the contents of the tutorials in cooperation with the other study assistants.

- Einführung in die (strukturierte) Programmierung
  (Introduction to (structured) programming)
- Softwareentwicklung Praktikum
  (Software development practicals)

2016 **Summer Intern**, *Graz University of Technology, Institute of Computer Graphics and Vision*, Graz.
Internship in the domain of medical image analysis using modern machine learning methods. Contribution to a tool which is used for online data-augmentation of medical image data using Caffe and the ITK image processing framework. Exploration of Generative Adversarial Networks and their application in the medical imaging domain.

2010, 2009 **Summer Intern**, *AVL List GmbH*, Graz.
Implementation of a C# script for mass license creation from an SAP MS Excel sheet using .Net COM-Interop to improve the work-flow of the department.

Student Projects

2017 **Game Design And Development**, *Graz University of Technology*, Graz.
Project lead, lead programmer, composer of "CoreWars", a 2D action game for PC/Mac/Linux/Mobile using the Unity game engine. My main responsibility was to create the concept as well as most of the game programming and the music. CoreWars was voted 'Best Game' of the course by the audience at the final presentation.

itch.io: https://thomasneff.itch.io/corewars

2013 **Mobile Applications**, *Graz University of Technology*, Graz.
Project lead of the development of an iOS educational platforming game called Super1x1 in cooperation with 2 colleagues. My main responsibility was to create the concept as well as the main game engine and the music. Super1x1 was voted to be the best app created during the course by all students attending.

App Store: https://itunes.apple.com/us/app/super-1x1/id664651808

Awards

2017 **OAGM Best Paper Award**, Vienna.
Our paper "Generative Adversarial Network based Synthesis for Supervised Medical Image Segmentation" was awarded the Best Paper Award at the OAGM & ARW Joint Workshop 2017.

2015 **Pebble Timeline Challenge Winner with "Greeney's Run"**, *Pebble*, Palo Alto, California.
Implementation of a procedurally generated endless platforming game in C using the Pebble SDK for the Pebble Smartwatch. "Greeney's Run" was selected to be one of 12 international winners of the Pebble Timeline Challenge, for which I received a prize as well as an invitation to the Pebble Developer Retreat 2015 in San Francisco. Greeney's Run has been installed more than 4000 times so far.

Pebble App Store: https://apps.getpebble.com/en_US/application/554f9adb4e604b9ed3000071
Pebble Blog: http://developer.getpebble.com/blog/2015/06/18/timeline-challenge-week-seven/
GitHub: https://github.com/thomasneff/GreeneysRun

2011 **Invent a Chip - 3rd Place**, *University of Technology Vienna*, Vienna.
Implementation of a chip used to measure and control power usage inside a household.

Languages

German Native
English Fluent (speaking, reading, writing)

Skills

Soft Skills Conflict Management, Group Dynamics

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Programming and Scripting	C, C++, C#, Python, Lua, Vulkan, OpenGL, Objective C (iOS), MatLAB, CUDA, Java
Deep Learning	TensorFlow, Caffe
Engineering	Computer Vision, Deep Learning, Computer Graphics, Signal Processing, Electrical Engineering, Electronics
Design	Adobe Photoshop
Game Development	Unity
Miscellaneous	LaTeX, Audio Engineering

Interests

Challenge	I love being challenged, and it's what drives me forward and helps me grow!
Music	As a guitarist, both listening to and writing music helps me relax and recover from everyday work.
Gaming	Gaming is a passion for me, as there are so many different concepts to explore and to learn from. I also love to deeply analyze and develop games myself.

Publications

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*.

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.

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.

2017 *** 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-ARWWorkshop2017/oagm-arw-17_paper_30.pdf.**

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.

*** Best Paper Award**