

Christina Schwarz-Gsaxner - Curriculum Vitae

6th August 2023

Status: PhD Student, Project Assistant

Expertise: Augmented Reality, Computer Vision, Computer-aided Medicine, Deep Learning

Languages: German: native, English: fluent

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On the verge of successfully completing my doctoral degree in computer graphics/computer vision, with a focus on medical applications of augmented reality. During my research work, I have specifically focused on the development and application of computer vision technologies for medical augmented reality scenarios. This has provided me with a strong background in computer vision, computer graphics, (medical) image processing, and deep learning. I am highly motivated to contribute my acquired expertise to research and development projects both within and beyond the medical field.

Work Experience

07/2023 – 09/2023	Visiting Researcher <i>RWTH Aachen</i> Clinic for Oral and Maxillofacial Surgery	📍 <i>Aachen, Germany</i>
10/2018 – today	Project Assistant <i>Graz University of Technology</i> Institute of Computer Graphics and Vision	📍 <i>Graz, Austria</i>
10/2018 – heute	Project Assistant <i>Medical University of Graz</i> Department for Oral and Maxillofacial Surgery	📍 <i>Graz, Austria</i>
01/2018 – 07/2018	Research Intern <i>Siemens Healthineers</i> Computer Vision Intern for Vision Technologies and Solutions	📍 <i>Princeton, USA</i>
02/2017 – 07/2017	Teaching Assistant <i>Graz University of Technology</i> Teaching Assistant for Computer Vision 1 und 2, Institute of Computer Graphics and Vision	📍 <i>Graz, Austria</i>

Education

10/2018 – 10/2023 (expected)	PhD <i>Graz University of Technology</i> Institute of Computer Graphics and Vision Doctoral Thesis: Towards Clinical Translation of Augmented Reality: A Framework for Surgical Navigation in Head and Neck Procedures. Supervisors: Univ.-Prof. Dr. Dieter Schmalstieg, Prof. Dr. Dr. Jan Egger	📍 <i>Graz, Austria</i>
03/2016 – 12/2017	MSc. <i>Graz University of Technology</i> Master Programme Biomedical Engineering Diplomarbeit: Automatic urinary bladder segmentation in CT images using deep learning. Supervisor: Prof. Dr. Dr. Jan Egger	📍 <i>Graz, Austria</i>

09/2011 – 02/2016

BSc.

Graz University of Technology

Bachelor Programme Biomedical Engineering

Bachelor Thesis: The influence of noise and noise reduction measures on the histomorphometric evaluation of high-resolution MR data. (in German)

Supervisor: Univ.-Prof. Dr. Rudolph Stollberger

📍 *Graz, Austria*

Awards and Honors

06/2023	Advanced Research Opportunities Program (AROP) scholarship , RWTH Aachen, for a three month Research Stay
02/2023	Cum Laude Poster Award , SPIE Medical Imaging Conference
08/2021, 08/2022	Outstanding Reviewer Award Honorable Mention , International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)
10/2020	Best Paper Award , MICCAI Clinical Image-based Procedures (MICCAI-CLIP) Workshop
10/2019	Finalist für Best Paper Award , MICCAI
08/2019	Graduate Student Travel Award , MICCAI Society, Travel Grant
12/2018	Best Paper Award , Biomedical Engineering International Conference (BMEiCON)

IT Skills

Programming Languages

Very experienced: Python, C++, C#.
Experienced: Matlab, HLSL.

Frameworks, Libraries and Platforms

Very experienced: PyTorch, OpenCV, Numpy, Universal Windows Platform, Unity 3D, OpenXR, Git, Visual Studio.
Basics: TensorFlow, CUDA, Unreal Engine, Amazon Web Services (AWS).

Scientific Activities

03/2023	Workshop participation <i>Wintergraph Workshop</i>	📍 <i>St. Johann im Pongau, Austria</i>
12/2022	Invited talk <i>Virtual Reality in Medicine Symposium</i>	📍 <i>Witten, Germany</i>
03/2022	Workshop participation <i>Wintergraph Workshop</i>	📍 <i>Kaprun, Austria</i>
12/2021	Conference talk <i>Virtual Reality Software and Technology (VRST) Symposium</i>	📍 <i>online</i>
10/2021	Program committee <i>Medical Imaging meets NeurIPS</i>	
08/2021	Mentor <i>Medical Augmented Reality Summer School</i>	📍 <i>online</i>

10/2020	Workshop talk MICCAI-CLIP Workshop	📍 online
10/2021	Organizational team MICCAI AutoImplant Challenge	
10/2019	Conference Talk, poster presentation MICCAI	📍 Shenzhen, China
08/2019	Participant Medical Augmented Reality Summer School	📍 Zurich, Switzerland
05/2019	Conference talk Österreichische Arbeitsgemeinschaft für Mustererkennung Workshop	📍 Steyr, Austria
2019-2023	Reviewer IEEE VR, IEEE TMI, MICCAI, ISMAR, MICCAI-CLIP, MICCAI-AECAI, IJCARS, IPCAI, CMPB, etc.	

Selected Publications

A full list of my publications can be found on Google Scholar:
<https://scholar.google.at/citations?user=1bnb71gAAAAJ&hl=de>

- [1] C. Gsaxner, S. Mori, J. Egger, W. Bailer, G. Paar, D. Kalkofen. DeepDR: Deep Structure-Aware RGB-D Inpainting for Diminished Reality. *Under review at 3DV* **2023**.
- [2] B. Scharinger, A. Pepe, Y. Jin, C. Gsaxner, J. Li, J. Egger, *Multicenter aortic vessel tree extraction using deep learning in Proceedings of SPIE Medical Imaging, Vol. 12468, 2023*, pp. 341–347, **[Best poster award]**.
- [3] C. Gsaxner, J. Li, A. Pepe, Y. Jin, J. Kleesiek, D. Schmalstieg, J. Egger. The HoloLens in medicine: A systematic review and taxonomy. *Medical Image Analysis* **2023**, 102757.
- [4] C. Gsaxner, J. Li, A. Pepe, D. Schmalstieg, J. Egger, *Inside-Out Instrument Tracking for Surgical Navigation in Augmented Reality in Proceedings of the ACM Symposium on Virtual Reality Software and Technology (VRST), 2021*, pp. 1–11, **[Oral]**.
- [5] C. Gsaxner, U. Eck, D. Schmalstieg, N. Navab, J. Egger, *Augmented reality in oral and maxillofacial surgery in Computer-Aided Oral and Maxillofacial Surgery, Elsevier, 2021*, pp. 107–139.
- [6] C. Gsaxner, A. Pepe, J. Li, U. Ibrahimasic, J. Wallner, D. Schmalstieg, J. Egger. Augmented Reality for Head and Neck Carcinoma Imaging: Description and Feasibility of an Instant Calibration, Markerless Approach. *Computer Methods and Programs in Biomedicine* **2020**, 105854.
- [7] F. Karner, C. Gsaxner, A. Pepe, J. Li, P. Fleck, C. Arth, J. Wallner, J. Egger, *Single-Shot Deep Volumetric Regression for Mobile Medical Augmented Reality in Proceedings of the MICCAI-CLIP Workshop, Springer, 2020*, pp. 64–74, **[Oral, best paper award]**.
- [8] C. Gsaxner, J. Wallner, X. Chen, W. Zemmann, J. Egger. Facial model collection for medical augmented reality in oncologic cranio-maxillofacial surgery. *Scientific Data* **2019**, 6.
- [9] C. Gsaxner, A. Pepe, J. Wallner, D. Schmalstieg, J. Egger, *Markerless Image-to-Face Registration for Untethered Augmented Reality in Head and Neck Surgery in Proceedings of the International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2019, [Oral, finalist for best paper award]*.
- [10] C. Gsaxner, P. M. Roth, J. Wallner, J. Egger, *Learning from the Truth: Fully Automatic Ground Truth Generation for Training of Medical Deep Learning Networks in Proceedings of the Joint ARW & OAGM Workshop, 2019, [Oral]*.
- [11] C. Gsaxner, B. Pfarrkirchner, L. Lindner, A. Pepe, P. M. Roth, J. Egger, J. Wallner, *PET-Train: Automatic Ground Truth Generation from PET Acquisitions for Urinary Bladder Segmentation in CT Images using Deep Learning in Proceedings of the IEEE Biomedical Engineering International Conference (BMEiCON), 2018*.
- [12] A. Pepe, G. F. Trotta, C. Gsaxner, J. Wallner, J. Egger, D. Schmalstieg, V. Bevilacqua, *Pattern Recognition and Mixed Reality for Computer-Aided Maxillofacial Surgery and Oncological Assessment in Proceedings of the IEEE Biomedical Engineering International Conference (BMEiCON), 2018, [Best paper award]*.