Elias Eulig

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Personal Data

Date of birth	September 30, 1995
Place of birth	Hanover, Germany
Citizenship	German

Work

2019 **Visiting Student Researcher** *Stanford University, Stanford, USA*
in the Department of Radiology under supervision of Dr. Adam Wang working on deep learning-based CT reconstruction for 4D interventional guidance.

2018 – present **Student Researcher** *German Cancer Research Center (DKFZ), Heidelberg, Germany*
in the X-Ray Imaging and Computed Tomography group under supervision of Prof. Dr. Marc Kachelrieß with main focus on the development of deep learning-based methods for CT and x-ray imaging applications.

2017 – 2018 **Student Researcher** *Max Planck Institute for Brain Research, Frankfurt, Germany*
in the Department of Connectomics under supervision of Prof. Dr. Moritz Helmstaedter, working on several deep learning-based methods for connectomics.

2016 **Teaching Assistant** *Ruprecht Karl University, Heidelberg, Germany*
for physics for medical students at the Heidelberg University School of Medicine.

2013 – 2014 **Voluntary Scientific Year** *Laser-Zentrum-Hanover (LZH), Hanover, Germany*
in the Laser Development Department working on the *MOMA (Mars Organic Molecule Analyser)* project under supervision of Dr. Christian Kolleck and Dr. Jörg Neumann.

Education

2019 – present **Master's Thesis** *DKFZ, Heidelberg, Germany & Stanford University, Stanford, USA*
on *Deep Learning-Aided CBCT Image Reconstruction for 4D Interventional Guidance* in a joint project between the Kachelrieß group at the German Cancer Research Center and the Wang group at Stanford University.

2017 – present **M.Sc. in Physics** *Ruprecht Karl University, Heidelberg, Germany*

2017 **Bachelor's Thesis** *Max Planck Institute for Brain Research, Frankfurt, Germany*
on *Matching of Axonal Fragments using Their Morphological and Synaptological Properties* written in the Department of Connectomics under supervision of Prof. Dr. Moritz Helmstaedter and Prof. Dr. Jürgen Hesser.

2014 – 2017 **B.Sc. in Physics** *Ruprecht Karl University, Heidelberg, Germany*

2013 **Abitur (A-levels)** *Wilhelm-Raabe-Schule, Hanover, Germany*

2005 – 2013 **Secondary School** *Wilhelm-Raabe-Schule, Hanover, Germany*

Scholarships & Awards

2020	**SPIE Student Travel Grant** to present the publication [2] at the SPIE Medical Imaging 2020 in Houston, TX.
2019	**Travel Scholarship** *(PROMOS)* of the *German Academic Exchange Service (DAAD)* for my period of research at Stanford University.
2019	**Travel Scholarship** of the *Society of High Performance Computational Imaging (SHPCI e.V.)* for my period of research at Stanford University.
2019	**Best Scientific Paper Presentation Award.** The conference contribution [5] received the *Best Scientific Paper Presentation Award within the topic Artificial Intelligence and Machine Learning* of the ECR 2019.
2013	**Best Abitur in Physics Award** by the *Deutsche Physikalische Gesellschaft (DPG)*.

Languages

German	Native proficiency
English	Full professional proficiency (C1 level)
French	Elementary proficiency (A2 level)

Computer Skills

Proficient with *Python*, *TensorFlow*, *PyTorch*, *Matlab*, *git*, and *R*.

Familiar with *C++*, *Mathematica*, *LabVIEW*, *TortoiseSVN*, and *SolidWorks*.

Experience running *Python* and *Matlab* applications on high-performance computing clusters together with the workload manager *Slurm*.

Extracurricular Activities

Active member of the German Social Democratic Party (SPD) and this party's student group.

Various activities as delegate and official in sessions organised by the European Youth Parliament (EYP).

Heidelberg, March 6, 2020

Elias Eulig

Publications

[1] **Elias Eulig**, J. Maier, N. R. Bennett, M. Knaup, K. Hörndler, A. Wang, and M. Kachelrieß, „Towards 4D Interventional Guidance: Reconstructing Interventional Tools from Four X-Ray Projections using a Deep Neural Network“, in *Program of the 26th European Congress of Radiology (ECR)*, Mar. 2020.

[2] **Elias Eulig**, J. Maier, N. R. Bennett, M. Knaup, K. Hörndler, A. Wang, and M. Kachelrieß, „Deep Learning-Aided CBCT Image Reconstruction of Interventional Material from Four X-Ray Projections“, in *Proceedings of the SPIE Medical Imaging Conference.*, Feb. 2020.

[3] **Elias Eulig**, J. Maier, M. Knaup, T. Koenig, K. Hörndler, and M. Kachelrieß, „Learned Digital Subtraction Angiography (Deep DSA): Method and Application to Lower Extremities“, in *Proceedings of the 15th International Meeting on Fully Three-Dimensional Image Reconstruction in Radiology and Nuclear Medicine*, volume 11072, Jun. 2019, pages 360–363.

[4] **Elias Eulig**, J. Maier, M. Knaup, T. Koenig, K. Hörndler, and M. Kachelrieß, „Deep DSA: Learning Mask-Free Digital Subtraction Angiography for Static and Dynamic Acquisition Protocols using a Deep Convolutional Neural Network“, in *Program of the 25th European Congress of Radiology (ECR)*, volume 10, Feb. 2019, page 379.

[5] J. Maier, **Elias Eulig**, S. Dorn, S. Sawall, and M. Kachelrieß, „Real-Time Patient-Specific CT Dose Estimation for Single- and Dual-Source CT using a Deep Convolutional Neural Network“, in *Program of the 25th European Congress of Radiology (ECR)*, volume 10, Feb. 2019, page 189.

[6] **Elias Eulig**, J. Maier, A. Hahn, and M. Kachelrieß, „Deep Inpainting for Photon-Counting Cone-Beam CT“, in *Program of the 105th Scientific Assembly and Annual Meeting of the RSNA*, Nov. 2018.

[7] J. Maier, **Elias Eulig**, S. Dorn, S. Sawall, and M. Kachelrieß, „Real-Time Patient-Specific CT Dose Estimation using a Deep Convolutional Neural Network“, in *Proceedings of the IEEE Nuclear Science Symposium and Medical Imaging Conference*, Nov. 2018, pages 1–3.

[8] J. Maier, **Elias Eulig**, S. Sawall, and M. Kachelrieß, „Deep Scatter Estimation (DSE) for Truncated Cone-Beam CT (CBCT)“, in *Program of the 105th Scientific Assembly and Annual Meeting of the RSNA*, Nov. 2018.

[9] J. Maier, **Elias Eulig**, T. Vöth, M. Knaup, S. Sawall, and M. Kachelrieß, „Real-Time Scatter Estimation for Medical CT using the Deep Scatter Estimation: Method and Robustness Analysis with Respect to Different Anatomies, Dose Levels, Tube Voltages, and Data Truncation“, *Medical Physics*, volume 46, number 1, pages 238–249, 2018.