Richard Droste

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Education

University of Oxford, PhD in Engineering Science — 10/2017 - present

- **Research:** Computer Vision, Medical Image Analysis, Robotics (see Experience section for details)
- **Funding:** Selected for full scholarship by University of Oxford.
- **Summer School:** Medical Imaging Summer School (MISS) 2018

ETH Zurich, MSc in Mechanical Engineering — 9/2014 – 6/2017

- **GPA:** 5.89/6, Distinction
- **Specialization:** Computer Vision, Biomedical Engineering, Robotics
- **Abroad:** Selected for Exchange Student Scholarship at the National University of Singapore (Fall 2015).
- **Summer School:** EXCITE Summer School on Biomedical Imaging Zurich 2016

ETH Zurich, Bsc in Mechanical Engineering — 9/2011 – 9/2014

- **GPA:** 5.21/6, Ranked top 7%
- **Research:** Designed a bioreactor for spaceflight and tested it in zero-g via computer vision within the final year.

Experience

University of Oxford, PhD Research — 10/2017 - present

- **Research:** First-authored seven papers at leading international conferences (ECCV, MICCAI, etc.) and journals.
- **Collaboration:** Published four additional papers and six clinical abstracts as co-author.
- **Deep Learning:** Developed novel and state-of-the-art multimodal deep learning models in PyTorch.
- **Engineering:** Built a parallelized vision-based Python program to automatically annotate 50TB of video data. Created a Python toolkit to access and process the dataset for a 15-person team.
- **Open-source:** Contributed to VGG VIA (JavaScript) and open-sourced own state-of-the-art visual saliency model.

ETH Zurich, Research Assistant and Master Thesis — 9/2016 – 9/2017

- Accelerated patient scan time 2-fold for "4D Flow" cardiac MRI.
- Devised, implemented and tested a novel image reconstruction algorithm in MatLab, Python and Julia.

McKinsey & Company, Fellow Intern — 4/2016 – 6/2016

- Implemented a $1bn growth strategy for a leader in energy and automation. Created a sales projection model.

Siemens Healthcare, R&D Intern — 2/2015 – 7/2015

- Improved robustness of stroke diagnosis by advancing a novel MRI algorithm.
- Scanned volunteers to test the algorithm in MatLab. Integrated the algorithm into the C++ production code.

ETH Zurich, Teaching Assistant — 9/2012 – 12/2014

- Taught Stochastics (Probability and Statistics), Innovation Project and Computer Aided Design.

Awards & Honors

- MICCAI 2020 Student Travel Award (awarded to the highest scoring first author students) — 2020
- Best Paper Award Runner Up at the IEEE Int. Symp. on Biomedical Imaging (ISBI) — 2020
- Best Paper Award at the 23rd Conference on Medical Image Understanding and Analysis (MIUA) — 2019
- Full scholarship for PhD by the University of Oxford (tuition fees and living costs) — 2017
- Distinction awarded by ETH Zurich for outstanding academic performance — 2017
- Won 2nd place out of over 140 teams at HackZurich (Europe's largest Hackathon) — 2017
- Won 2nd place out of over 50 teams at the LauzHack Major League Hackathon — 2016
- Exchange Student Scholarship for the National University of Singapore (tuition fees and travel stipend) — 2015

Skills

★★★ Proficient ★★ Intermediate ★ Learning

Programming:	Python ★★★	C++ ★★	MatLab ★★★	Julia ★	Bash ★★	JS/HTML/CSS ★
Libraries:	PyTorch ★★★	OpenCV ★★★	Scikit-Learn ★★★	Pandas ★★	Numpy/Scipy ★★★	
Tools:	Git ★★★	GNU/Linux ★★★	LaTeX ★★★	CAD (Siemens NX) ★★	MS Office, etc. ★★★	

Coursera: Algorithms: Design & Analysis (I&II); Structuring Machine Learning Projects.
Languages: Proficient: English (118/120 TOEFL), German (native), Beginner: Russian, Italian

Leadership & Extracurricular Activities

Reviewer, IEEE RA-L, UOG, MICCAI ASMUS (2020) 2019 - 2020

Captain, Oxford University Underwater Hockey Club 2019 - 2020

Student council member, Department of Mech. and Proc. Eng., ETH Zurich 2011 - 2015

Lead organizer of exam preparation courses, Department of Mech. and Proc. Eng., ETH Zurich 2011 - 2014

- Organized over eighty non-profit exam preparation courses for roughly six hundred students.

Semester Spokesperson, Department of Mech. and Proc. Eng., ETH Zurich 2011 - 2014

- Elected annually; communicated student feedback to professors; evaluated and improved teaching.

Publications

First author and co-first author papers

- Unified Image and Video Saliency Modeling.
  Richard Droste*, Jianbo Jiao*, J. Alison Noble. *Equal contribution.
  European Conference on Computer Vision (ECCV) 2020. – Spotlight presentation (top 5%).
- Automatic Probe Movement Guidance for Freehand Obstetric Ultrasound.
  Richard Droste, Lior Drukker, Aris T. Papageorghiou, J. Alison Noble.
  Medical Image Computing and Computer Assisted Intervention (MICCAI) 2020. – Early-accepted. Oral presentation.
- Salient Anatomical Landmarks by Predicting Human Gaze.
  Richard Droste, Pierre Chatelain, Lior Drukker, Harshita Sharma, Aris T. Papageorghiou, J. Alison Noble.
  IEEE International Symposium on Biomedical Imaging (ISBI) 2020. – Oral presentation. Best Paper Award Runner Up.
- Safety Indices of Ultrasound: Adherence to Recommendations and Awareness During Routine Obstetric Ultrasound Scanning.
  Lior Drukker*, Richard Droste*, Pierre Chatelain, J. Alison Noble, Aris T. Papageorghiou. *Equal contribution.
  European Journal of Ultrasound 41(02): 138–145, 2020. – Editor's Choice.
- Expected-Value Bias in Routine Third-Trimester Growth Scans.
  Lior Drukker*, Richard Droste*, Pierre Chatelain, J. Alison Noble, Aris T. Papageorghiou. *Equal contribution.
  Ultrasound in Obstetrics & Gynecology 55: 375–382, 2020.
- Ultrasound Image Representation Learning by Modeling Sonographer Visual Attention.
  Richard Droste, Yifan Cai, Harshita Sharma, Pierre Chatelain, Lior Drukker, Aris T. Papageorghiou, J. Alison Noble.
  Information Processing in Medical Imaging (IPMI), 2019.
- Towards Capturing Sonographic Experience: Cognition-Inspired Ultrasound Video Saliency Prediction.
  Richard Droste, Yifan Cai, Harshita Sharma, Pierre Chatelain, Aris T. Papageorghiou, J. Alison Noble.
  Medical Image Understanding and Analysis (MIUA), 2019. – Oral presentation, Best Paper Award.

Co-authored papers

- Differentiating Operator Skill during Routine Fetal Ultrasound Scanning using Probe Motion Tracking.
  Yipei Wang, Richard Droste, Jianbo Jiao, Harshita Sharma, Lior Drukker, Aris T. Papageorghiou, J. Alison Noble.
  Advances in Simplifying Medical UltraSound (ASMUS, MICCAI Workshop), 2020.
- Self-supervised Representation Learning for Ultrasound Video.
  Jianbo Jiao, Richard Droste, Lior Drukker, Aris T. Papageorghiou, J. Alison Noble.
  IEEE International Symposium on Biomedical Imaging (ISBI), 2020.
- Spatio-Temporal Visual Attention Modelling of Standard Biometry Plane-Finding Navigation.
  Yifan Cai, Richard Droste, Harshita Sharma, Pierre Chatelain, Lior Drukker, Aris T. Papageorghiou, J. Alison Noble.
  Medical Image Analysis, 65: 101762, 2020.
- Spatio-Temporal Partitioning and Description of Full-length Routine Fetal Anomaly Ultrasound Scans.
  Harshita Sharma, Richard Droste, Pierre Chatelain, Lior Drukker, Aris T. Papageorghiou, J. Alison Noble.
  IEEE International Symposium on Biomedical Imaging (ISBI), 2019.– Oral presentation.

For a full list of publications please see my Google Scholar page or my personal homepage.