
Education

PhD in Engineering Science, University of Oxford, **Since 10.2017**

- *Topic:* Machine learning & deep learning for fetal ultrasound video analysis.
- *Funding:* Full scholarship by the University of Oxford.
- *Summer School:* 2018 Medical Imaging Summer School.

MSc Mechanical Engineering, ETH Zurich, **9.2014-6.2017**

- *Graduated with Distinction*; Swiss GPA*: 5.89.
- *Specialization:* Biomedical Engineering, Computer Vision, Robotics, Micro- and Nanotechnology.
- *Master Thesis:* “Motion State Binning for the Reconstruction of 4D Flow Magnetic Resonance Imaging”
- *Summer School:* 10th Zurich Summer School on Multiscale Biomedical Imaging.
- *Exchange Semester:* National University of Singapore; received Exchange Student Scholarship.

BSc Mechanical Engineering, ETH Zurich, **9.2011-9.2014**

- *Ranked top 7%*; Swiss GPA*: 5.23
- *Final Year Project:* “Design and Fluid Mechanical Evaluation of Photobioreactors for a Life Support System in Space”
 - Selected for the 24th parabolic flight experiment campaign of the German Aerospace Center.

Employment

Research Assistant, Cardiovascular Magnetic Resonance Group, ETH Zurich, **4.2017-8.2017**

- Accelerated cardiac blood flow imaging (5D Flow MRI).
- Developed, implemented and evaluated an efficient ADMM-based low-rank + sparse image reconstruction algorithm.

Fellow Intern, McKinsey & Company, Düsseldorf, Germany, **4.2016-6.2016**

- Developed and implemented a growth strategy for a leading global specialist in energy management and automation.

R&D Intern, Siemens Healthcare MR, Erlangen, Germany, **2.2015-7.2015**

- Implemented and advanced a novel method for label-free MR neuro perfusion imaging (multi-TI 3D pCASL).

Teaching Assistant, ETH Zurich, **9.2012-12.2014**

- *Stochastics (Probability and Statistics)* for the Department of Mathematics (Fall 2014).
- *Innovation Project* for the Chair in Product Development & Engineering Design (Spring 2013).
- *Technical Drawing and Computer Aided Design* for the Inst. for Robotics & Intelligent Systems. (Fall 2012)

Publications

Conference Papers

- **Richard Droste**, Yifan Cai, Harshita Sharma, Pierre Chatelain, Lior Drukker, Aris T. Papageorghiou, J. Alison Noble. Ultrasound Image Representation Learning by Modeling Sonographer Visual Attention. In: *Information Processing in Medical Imaging (IPMI)*, 2019.
- **Richard Droste**, Yifan Cai, Harshita Sharma, Pierre Chatelain, Aris T. Papageorghiou, J. Alison Noble. Towards Capturing Sonographic Experience: Cognition-Inspired Ultrasound Video Saliency Prediction. In: *Medical Image Understanding and Analysis (MIUA)*, 2019. – *Oral presentation, best paper award.*
- Harshita Sharma, **Richard Droste**, Pierre Chatelain, Lior Drukker, Aris T. Papageorghiou, J. Alison Noble. Spatio-Temporal Partitioning and Description of Full-length Routine Fetal Anomaly Ultrasound Scans. In: *IEEE International Symposium on Biomedical Imaging (ISBI)*, 2019. – *Oral presentation.*

Journal Papers

- Lior Drukker[†], **Richard Droste**[†], Pierre Chatelain, J. Alison Noble, Aris T. Papageorghiou. Safety indices of ultrasound: adherence to recommendations and awareness during routine obstetric ultrasound scanning. *European Journal of Ultrasound*, *in press*.
- Lior Drukker[†], **Richard Droste**[†], Pierre Chatelain, J. Alison Noble, Aris T. Papageorghiou. Routine third-trimester growth scans: how common is expected value bias? *Ultrasound in Obstetrics & Gynecology*, <https://doi.org/10.1002/uog.21929>, *in press*.

Clinical Abstracts

- Lior Drukker[†], **Richard Droste**[†], J. Alison Noble, Aris T. Papageorgiou. Which landmarks do sonographers look at while acquiring second- and third-trimester standard biometry planes? In *Annual Integrative Ultrasound Meeting (AIUM)*, 2020. – *Oral presentation*.
- Lior Drukker[†], **Richard Droste**[†], Pierre Chatelain, J. Alison Noble, Aris T. Papageorgiou. OC10.02: Bioeffects safety indices of ultrasound: quantifying adherence to recommendations on routine obstetric scan *Ultrasound Obstet. Gynecol.*, 54: 24-24, 2019. – *Oral presentation*.
- Lior Drukker[†], **Richard Droste**[†], Pierre Chatelain, J. Alison Noble, Aris T. Papageorgiou. OC19.02: A novel eye tracking study: how common is expected value bias in fetal growth scan assessment? *Ultrasound Obstet. Gynecol.*, 54: 47-48, 2019. – *Oral presentation*.
- Lior Drukker, **Richard Droste**, Pierre Chatelain, Harshita Sharma, Yifan Cai, Jaan Toots, Mohammed Alsharid, J. Alison Noble, Aris T. Papageorgiou. Monitoring Sonographer Performance: The Perception Ultrasound by Learning Sonographer Experience (PULSE) Study. In *AIUM*, 2019. – *Oral presentation*.
- Jonas Walheim, Hannes Dillinger, **Richard Droste**, Sebastian Kozerke. 5D Flow MRI - Respiratory-Motion Resolved Quantification of Flow and Turbulent Kinetic Energy with Compressed Sensing and Bayesian Multipoint Velocity Unfolding. In *Proceedings from the 22nd Annual SCMR Scientific Sessions*, 2019. – *Oral presentation*.

Extracurricular Activities

- Captain**, Oxford University Underwater Hockey Club, **Since 2019**
- Student council member**, Department of Mech. and Proc. Eng., ETH Zurich, **2011-2015**
- Contributed to department politics. Presented at the European Mechanical Engineering Student Council Congress.
- 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 at the department.
- Elected semester spokesperson**, Department of Mech. and Proc. Eng., ETH Zurich, **2011-2014**
- Elected annually; communicated student concerns to professors; evaluated and improved teaching quality.

Awards and Scholarships

- 2019 Best paper award at the 23rd Conference on Medical Image Understanding and Analysis (MIUA).
- 2017 Full scholarship for PhD by the University of Oxford (tuition fees and living costs).
- 2017 Awarded distinction by ETH Zurich for outstanding academic performance.
- 2017 Won 2nd place out of over 140 teams at HackZurich (Europe's largest Hackathon) 2017.
- 2016 Won 2nd place out of over 50 teams at the LauzHack Major League Hackathon 2016.
- 2015 Exchange student scholarship for an exchange semester at the National University of Singapore (tuition fees and travel stipend), awarded by ETH Zurich based on academical merit.

Skills

- Programming Python, C++, MatLab, Julia, Bash.
- Frameworks PyTorch, TensorFlow, Keras, Scikit-Learn, Pandas, Scipy, Numpy.
- Software Git, GNU/Linux, L^AT_EX, MS Office, Siemens NX (CAD), ANSYS CFX (CFD), Mathematica.
- Languages *Proficient*: English (118/120 TOEFL); *Native*: German; *Beginner*: Russian, Italian.

*The Swiss grading scale ranges from 1.0 (very poor) to 6.0 (excellent); Distinction granted in the Master for a GPA above 5.75

[†]Equal contribution. I was the engineering lead for these studies.