

# Fredrik K. Gustafsson

PHD STUDENT · UPPSALA UNIVERSITY

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## Education

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### Uppsala University

*Doctor of Philosophy (PhD), Electrical Engineering*

2018 - 2023 (expected)

### Linköping University

*Master of Science (MSc), Electrical Engineering*

2016 - 2018

### Stanford University

*Graduate Exchange Student, Electrical Engineering*

2016 - 2017

### Linköping University

*Bachelor of Science (BSc), Applied Physics and Electrical Engineering*

2013 - 2016

## Professional Experience

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### PhD Student

*Uppsala University, Department of Information Technology*

• Supervisors: Thomas Schön & Martin Danelljan.

*Uppsala, Sweden*

*Oct. 2018 - present*

### Contingent Worker

*Facebook Reality Labs, FRL Research Pittsburgh*

• Part-time internship extension.

*Remote*

*Sep. 2021 - Dec 2021*

### Research Intern

*Facebook Reality Labs, FRL Research Pittsburgh*

• 3D human pose estimation, working with Weipeng Xu (remote due to COVID-19).

*Remote*

*Jun. 2021 - Sep. 2021*

### Software Engineer

*BMW Group*

• Feature development for autonomous driving and advanced driver assistance systems.

*Munich, Germany*

*Aug. 2018*

### Master's Thesis Student

*Zenuity*

• 3D detection of vehicles in LiDAR and/or image data, using deep learning.

*Gothenburg, Sweden*

*Jan. 2018 - Jun. 2018*

### Summer Intern

*Zenuity*

• Developed a deep learning demo/test platform based on a standard 1/10 scale RC car.

*Gothenburg, Sweden*

*Jun. 2017 - Aug. 2017*

### Summer Intern

*T Engineering*

• Developed a web tool for visualization of car engine sensor data for a fleet of test vehicles.

*Trollhättan, Sweden*

*Jun. 2016 - Aug. 2016*

### Teaching Assistant

*Linköping University, Department of Mathematics*

*Linköping, Sweden*

*Aug. 2014 - Dec. 2015*

## Publications

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### **Refusion: Enabling Large-Size Realistic Image Restoration with Latent-Space Diffusion Models**

Ziwei Luo, [Fredrik K. Gustafsson](#), Zheng Zhao, Jens Sjölund, Thomas B. Schön

The IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPR Workshops), 2023

### **How Reliable is Your Regression Model's Uncertainty Under Real-World Distribution Shifts?**

[Fredrik K. Gustafsson](#), Martin Danelljan, Thomas B. Schön

Preprint, 2023

### **Image Restoration with Mean-Reverting Stochastic Differential Equations**

Ziwei Luo, [Fredrik K. Gustafsson](#), Zheng Zhao, Jens Sjölund, Thomas B. Schön

The International Conference on Machine Learning (ICML), 2023

### **ECG-Based Electrolyte Prediction: Evaluating Regression and Probabilistic Methods**

Philipp Von Bachmann, Daniel Gedon, [Fredrik K. Gustafsson](#), Antônio H. Ribeiro, Erik Lampa, Stefan Gustafsson, Johan Sundström, Thomas B. Schön

Preprint, 2022

### **Learning Proposals for Practical Energy-Based Regression**

[Fredrik K. Gustafsson](#), Martin Danelljan, Thomas B. Schön

The International Conference on Artificial Intelligence and Statistics (AISTATS), 2022

### **Uncertainty-Aware Body Composition Analysis with Deep Regression Ensembles on UK Biobank MRI**

Taro Langner, [Fredrik K. Gustafsson](#), Benny Avelin, Robin Strand, Håkan Ahlström, Joel Kullberg

Computerized Medical Imaging and Graphics, 2021

### **Deep Energy-Based NARX Models**

Johannes Hendriks, [Fredrik K. Gustafsson](#), Antônio Ribeiro, Adrian Wills, Thomas B. Schön

The 19th IFAC Symposium on System Identification (SYSID), 2021

### **Accurate 3D Object Detection using Energy-Based Models**

[Fredrik K. Gustafsson](#), Martin Danelljan, Thomas B. Schön

The IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPR Workshops), 2021

### **How to Train Your Energy-Based Model for Regression**

[Fredrik K. Gustafsson](#), Martin Danelljan, Radu Timofte, Thomas B. Schön

The British Machine Vision Conference (BMVC), 2020

### **Energy-Based Models for Deep Probabilistic Regression**

[Fredrik K. Gustafsson](#), Martin Danelljan, Goutam Bhat, Thomas B. Schön

The European Conference on Computer Vision (ECCV), 2020

### **Evaluating Scalable Bayesian Deep Learning Methods for Robust Computer Vision**

[Fredrik K. Gustafsson](#), Martin Danelljan, Thomas B. Schön

The IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPR Workshops), 2020

### **Automotive 3D Object Detection Without Target Domain Annotations**

[Fredrik K. Gustafsson](#), Erik Linder-Norén

Master of Science Thesis in Electrical Engineering, Linköping University, 2018

## Teaching Experience

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### UPPSALA UNIVERSITY

- Spr. 2023 **1RT495 Automatic Control II (MSc)**, Teaching Assistant (*problem-solving sessions, grading*)
- Aut. 2022 **1RT700 Statistical Machine Learning (MSc)**, Teaching Assistant (*problem-solving sessions, grading*)
- Aut. 2022 **1RT890 Empirical Modelling (MSc)**, Teaching Assistant (*problem-solving sessions, labs, grading*)
- Spr. 2022 **1RT700 Statistical Machine Learning (MSc)**, Teaching Assistant (*problem-solving sessions, grading*)
- Aut. 2021 **1RT890 Empirical Modelling (MSc)**, Teaching Assistant (*problem-solving sessions, grading*)
- Spr. 2021 **1RT495 Automatic Control II (MSc)**, Teaching Assistant (*computer labs, labs*)
- Spr. 2021 **1RT490 Automatic Control I (BSc)**, Teaching Assistant (*problem-solving sessions, grading*)

- Aut. 2020 **1RT890 Empirical Modelling (MSc)**, Teaching Assistant (*problem-solving sessions, grading*)  
Spr. 2020 **1RT700 Statistical Machine Learning (MSc)**, Lab Assistant  
Spr. 2020 **1RT490 Automatic Control I (BSc)**, Teaching Assistant (*problem-solving sessions, grading*)  
Aut. 2019 **1RT490 Automatic Control I (BSc)**, Teaching Assistant (*problem-solving sessions, grading*)  
Spr. 2019 **Deep Learning (PhD)**, Teaching Assistant (*help desks, grading*)  
Spr. 2019 **1RT700 Statistical Machine Learning (MSc)**, Lab Assistant  
Spr. 2019 **1RT490 Automatic Control I (BSc)**, Teaching Assistant (*problem-solving sessions, grading*)

## LINKÖPING UNIVERSITY

- Aut. 2015 **TATA24 Linear Algebra (BSc)**, Teaching Assistant (*mentor sessions*)  
Aut. 2015 **TATM79 Found. Course in Mathematics (BSc)**, Teaching Assistant (*supervisor sessions, grading*)  
Aut. 2014 **TATA24 Linear Algebra (BSc)**, Teaching Assistant (*mentor sessions*)  
Aut. 2014 **TAIU10 Calculus One Variable, Prep. Course (BSc)**, Teaching Assistant (*problem-solving sessions*)

## Academic Service

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### REVIEWING

- NeurIPS 2023**, Upcoming  
**BMVC 2023**, Upcoming  
**ICCV 2023**, Upcoming  
**AISTATS 2023**, 3 Papers  
**AAAI 2023**, 3 + 4 Papers  
**BMVC 2022**, 6 Papers  
**ECCV 2022**, 8 Papers  
**CVPR 2022**, 2 Papers  
**AISTATS 2022**, 3 Papers  
**AAAI 2022**, 4 + 2 Papers  
**BMVC 2021**, 6 Papers  
**EBM Workshop at ICLR 2021**, 3 Papers  
**ICRA 2021**, 1 Paper  
**BMVC 2020**, 1 Paper  
**IFAC World Congress 2020**, 2 Papers

## Invited Talks

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- Accurate 3D Object Detection using Energy-Based Models***, Zenseact, Gothenburg, Sweden (*Online*), 2021.  
***Evaluating Scalable Bayesian Deep Learning Methods for Robust Computer Vision***, Zenuity, Gothenburg, Sweden, 2019.

## Awards

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The Tryggve Holm medal for “*outstanding student achievements*” at Linköping University, 2018.

## Languages

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Swedish (native), English (fluent).