



## Dr. Robin Chan

Born in January, 1993  
in Wesel, Germany

Currently living in  
Berlin, Germany

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## Research Interests

- Safe Artificial Intelligence
- Computer Vision
- Deep Learning
- Generative Models

## Education

at the UNIVERSITY OF WUPPERTAL

**2022. Doctor of Natural Sciences**  
Mathematics (*“summa cum laude”*)

**2018. Master of Science**  
Mathematics

**2017. Bachelor of Science**  
Mathematical Economics

## Coding Skills

Python ●●●● PyTorch ●●●●  
Pyro ●●○○ R ●●○○

## Work Experience

**Aug. 2022 – Present. Postdoctoral Researcher**  
BIELEFELD UNIVERSITY – Bielefeld, Germany  
Faculty of Technology – Machine Learning Group

**Nov. 2019 – Jun. 2022. Research Assistant**  
UNIVERSITY OF WUPPERTAL – Wuppertal, Germany  
IZMD, Stochastics Group

**Nov. 2018– Oct. 2019. Research Assistant**  
UNIVERSITY OF WUPPERTAL – Wuppertal, Germany  
Applied Computer Science Group

**Sep. 2017– Sep. 2018. Intern**  
VOLKSWAGEN GROUP RESEARCH – Wolfsburg, Germany  
Automated Driving – Architecture and AI Technologies

**Apr. 2016– Oct. 2016. Intern**  
SIEMENS AG ENERGY SECTOR – Berlin, Germany  
Large Gas Turbines – Probabilistic Design

## Own Research Projects

**Jul. 2022 – Jun. 2024. Out-of-Distribution Detection via  
Generative Modeling of Deep Latent Representations**  
funded by the Ministry of Culture and Science of the German  
State of North Rhine-Westphalia – EUR 164,750.62

## Industry Projects

**Jun. 2019 – Jun. 2022. Methods for Safe AI for Automated  
Driving: Training Meta Classifiers**  
funded by the German Federal Ministry for Economic Affairs  
and Climate Action within the project “KI Absicherung”

**Jun. 2019 – Nov. 2019. Evaluation of Cost-based Decision  
Rules and Uncertainty-based Meta Segmentation**  
funded by VOLKSWAGEN GROUP RESEARCH

**Nov. 2018 – Jun. 2019. Application of the Maximum  
Likelihood Rule in Semantic Segmentation**  
funded by VOLKSWAGEN GROUP RESEARCH

Last updated: March, 2023.

## Publications (Selection)

- Robin Chan, Radin Dardashti, Meike Osinski, Matthias Rottmann, Dominik Brüggemann, Cilia Rücker, Peter Schlicht, Fabian Hüger, Nikol Rummel, and Hanno Gottschalk. *“What Should AI See? Using the Public’s Opinion to Determine the Perception of an AI”*. AI and Ethics 2023
- Kira Maag, Robin Chan, Svenja Uhlemeyer, Kamil Kowol, Hanno Gottschalk. *“Two Video Data Sets for Tracking and Retrieval of Out of Distribution Objects”*. Asian Conference on Computer Vision (ACCV) 2022
- Robin Chan, Krzysztof Lis, Svenja Uhlemeyer, Hermann Blum, Sina Honari, Roland Siegwart, Pascal Fua, Mathieu Salzmann, and Matthias Rottmann. *“SegmentMeIfYouCan - A Benchmark for Anomaly Segmentation”*. 35th Conference on Neural Information Processing Systems (NeurIPS) Datasets and Benchmarks Track 2021
- Robin Chan, Matthias Rottmann, and Hanno Gottschalk. *“Entropy Maximization and Meta Classification for Out-of-Distribution Detection in Semantic Segmentation”*. The IEEE/CVF International Conference on Computer Vision (ICCV) 2021
- Dominik Brüggemann, Robin Chan, Hanno Gottschalk, and Stefan Bracke. *“Software Architecture for Human-centered Reliability Assessment for Neural Networks in Autonomous Driving”*. 11th IMA International Conference on Modelling in Industrial Maintenance and Reliability (MIMAR) 2021
- Robin Chan, Matthias Rottmann, Fabian Hüger, Peter Schlicht, and Hanno Gottschalk. *“MetaFusion: Controlled False-Negative Reduction of Minority Classes in Semantic Segmentation”*. The IEEE International Joint Conference on Neural Networks (IJCNN) 2020
- Matthias Rottmann, Pascal Colling, Thomas-Paul Hack, Robin Chan, Fabian Hüger, Peter Schlicht, and Hanno Gottschalk. *“Prediction Error Meta Classification in Semantic Segmentation: Detection via Aggregated Dispersion Measures of Softmax Probabilities”*. The IEEE International Joint Conference on Neural Networks (IJCNN) 2020
- Dominik Brüggemann, Robin Chan, Matthias Rottmann, Hanno Gottschalk, and Stefan Bracke. *“Detecting Out Of Distribution Objects in Semantic Segmentation of Street Scenes”*. The 30th European Safety and Reliability Conference (ESREL) 2020
- Robin Chan, Matthias Rottmann, Fabian Hüger, Peter Schlicht, and Hanno Gottschalk. *“Application of Maximum Likelihood Decision Rules for Handling Class Imbalance in Semantic Segmentation”*. The 30th European Safety and Reliability Conference (ESREL) 2020
- Matthias Rottmann, Kira Maag, Robin Chan, Fabian Hüger, Peter Schlicht, and Hanno Gottschalk. *“Detection of False Positive and False Negative Samples in Semantic Segmentation”*. Design, Automation and Test in Europe (DATE) Conference 2020
- Robin Chan, Matthias Rottmann, Radin Dardashti, Fabian Hüger, Peter Schlicht, and Hanno Gottschalk. *“The Ethical Dilemma when (not) Setting up Cost-based Decision Rules in Semantic Segmentation”*. The IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, Safe Artificial Intelligence for Automated Driving (SAIAD) 2019

## Dissertation and Theses

Feb. 2022. **Detecting Anything Overlooked in Semantic Segmentation** (for the degree of Dr. rer. nat.)

**Abstract:** Deep learning models are all driven by data and as such they are ill-equipped to handle data samples from categories that they rarely or even never have previously encountered. The focus of this dissertation lies on detecting objects in images, where the objects initially have been overlooked due to the described data related reason and the use of out-of-the-box deep learning algorithms. In this dissertation, several approaches to extend deep learning models are presented in order to improve the detection and localization of rare as well as unknown objects in the safety critical task of semantic segmentation of street scenes.

**Doctoral advisor:** Prof. Dr. Hanno Gottschalk

**Grade:** “*summa cum laude*”

Sep. 2018. **Application of Decision Rules for Uncertainty Quantification in Semantic Segmentation** (in cooperation with VOLKSWAGEN GROUP RESEARCH for the degree of M.Sc.)

**Abstract:** One difficulty that occurs while training neural networks for semantic segmentation is class imbalance of the training data. Various decision rules other than the standard maximum a-posteriori principle but with different sensitivity towards predicting rare classes are evaluated in this thesis. Differences in the obtained prediction masks then indicate the model uncertainty of finding rare class objects.

**Supervisors:** Prof. Dr. Hanno Gottschalk and Dr. Matthias Rottmann

**Grade:** 1.0

Jan. 2017. **Stochastische Performance Tests der Dakota Optimierungstoolsuite** (Stochastically Evaluating the Performance of Optimization Algorithms from the Dakota Software Toolkit for the degree of B.Sc.)

**Abstract:** In practice, there are often multiple algorithms with different parameters for the same kind of optimization problems. In order to choose the right model for a new kind of problem, in this thesis optimization algorithms are evaluated on random fields. From the resulting distribution of solutions and by means of robustness measures the performance of optimization algorithms is stochastically evaluated.

**Supervisors:** Prof. Dr. Hanno Gottschalk and Prof. Dr. Kathrin Klamroth

**Grade:** 1.0

## Awards

Verein der Freunde und Alumni der Bergischen Universität e.V. (FABU) (Association Friends and Alumni of the University of Wuppertal) – 1st prize for dissertation in university wide competition in 2022

Verein zur Förderung von Mathematik & Naturwissenschaften e.V. (Association for Promotion of Mathematics and Natural Sciences at the University of Wuppertal) – prize for outstanding achievements during doctoral studies