



# Julian Bitterwolf

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## Education

- since 2018 **PhD Student**, with *Prof. Matthias Hein, University of Tübingen*  
Research topics: robust machine learning; out-of-distribution detection; empirical and provable adversarial robustness; non-identically distributed inputs.
- 2013-2014 **MSc Mathematics**, *École Polytechnique & Université Paris Sud 11*, Final grade: 15.3/20  
Program: "Mathematics: Analysis, Arithmetics and Geometry". Thesis: "The Eilenberg-MacLane Theorem for Simplicial Sheaves" with Prof. Fabien Morel.
- 2012-2013 **Erasmus Year**, *École Polytechnique*  
3rd year mathematics program. Final presentations on representation theory and quantum groups.
- 2011-2017 **BSc Mathematics**, *Karlsruhe Institute of Technology (KIT)*, Final grade: 1.1  
Thesis: "Models for Synthetic Differential Geometry" with Prof. Frank Herrlich and Dr. Felix Wellen.
- 2010-2015 **BSc Physics**, *KIT*, Final grade: 1.3  
with minor in Business Administration. Thesis "Path Integration via Infinitesimal Complex Time Phases" on instantons with supervisors Prof. Jörg Schmalian and Dipl.-Phys. Pia Gagel.
- 2001-2009 **Abitur**, *Lessing-Gymnasium Karlsruhe*, Final grade: 1.4

## Professional Experience and Teaching

- 2022 **ICML Workshop Organizer**, "Shift happens: Crowdsourcing metrics and test datasets beyond ImageNet", see <https://shift-happens-benchmark.github.io>
- since 2018 **Teaching responsibilities as part of the PhD position**, organizing exercises for "Mathematics 1" and "Convex and Non-Convex Optimization", conducting student programming projects on "Auditing DNNs", supervising a master thesis on AI planning "Neural network heuristic functions: Taking confidence into account"
- 2017-2018 **Research Assistant**, *Research Center for Information Technology (FZI) Karlsruhe*  
Research on the influence of environmental effects on deep learning models for image recognition in autonomous driving.
- 2015, '16, '17 **Lecturer: Preparatory course in physics**, *Karlsruhe University of Applied Sciences*
- 2017 **Lecturer: Preparatory course in mathematics for economics**, *Karlsruhe University of Applied Sciences*
- 2011-2012 **IT System Administrator**, *Institute of Algebra and Geometry, KIT*
- 2011-2015 **Secretary and Board Member of Hector-Seminar-Alumni e.V.**
- 2010-2011 **Tutor**, accompanying the lecture "Linear Algebra and Analytic Geometry I" by Prof. Daniel Hug and Prof. Wilderich Tuschmann
- 2009-2010 **Military service**, as a combat signaller in the German armed forces.

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## Prizes, honours and extracurricular education

- 2022 Selected as "**Highlighted Reviewer of ICLR 2022**".
- since 2019 **Reviewer** at NeurIPS, ICML, ICLR, JMLR.
- 2018 **School of AI at Pi School** in Rome, working on a project commissioned by the Agency for Digital Italy on identifying cultural heritage items given a photo and contextual information.
- 2017 Participant at the **EUTypes Summer School** in Ohrid, MK
- 2012 – 2013 Holder of a **Deutschlandstipendium**, the German federal scholarship for highly talented students.
- 2002 – 2009 Participant of the **Hector-Seminar**, a weekly STEM seminar class.

## Computer skills

Programming	Python, C++, Lean	Graphics	Inkscape, GIMP, OpenCV
Office	LaTeX, LibreOffice	Calculation	PyTorch, TensorFlow, Numpy, MATLAB

## Publications

- [1] D. Heller, P. Ferber, J. Bitterwolf, M. Hein, and J. Hoffmann, "Neural network heuristic functions: Taking confidence into account," accepted at SoCS 2022.
- [2] J. Bitterwolf, A. Meinke, M. Augustin, and M. Hein, "Revisiting out-of-distribution detection: A simple baseline is surprisingly effective," *Currently under review*, presented at the ICML UDL workshop 2021.
- [3] A. Meinke, J. Bitterwolf, and M. Hein, "Provably robust detection of out-of-distribution data (almost) for free," *Currently under review*, presented at the ICML UDL workshop 2021.
- [4] J. Bitterwolf, A. Meinke, and M. Hein, "Certifiably adversarially robust detection of out-of-distribution data," NeurIPS 2020.
- [5] E. Rusak, L. Schott, R. S. Zimmermann, J. Bitterwolf, O. Bringmann, M. Bethge, and W. Brendel, "A simple way to make neural networks robust against diverse image corruptions," Oral presentation at ECCV 2020.
- [6] M. Hein, M. Andriushchenko, and J. Bitterwolf, "Why relu networks yield high-confidence predictions far away from the training data and how to mitigate the problem," Oral presentation at CVPR 2019.