

# STEPHAN RABANSER

☎ +49 (0)157 31765174 — ✉ stephan@rabanser.dev — 🌐 rabanser.dev  
Einsteinstr. 3 — Garching bei München, Bavaria 85748 — Germany

## EDUCATION

---

<b>PhD in Computer Science (w/ Prof. Nicolas Papernot)</b> <i>University of Toronto &amp; Vector Institute</i>	September 2020 – Present <i>Toronto, Canada</i>
<b>M.Sc. in Computer Science (w/ Prof. Stephan Günnemann)</b> <i>Technical University of Munich (TUM)</i>	October 2015 – July 2019 <i>Munich, Germany</i>
<b>Visiting Research Scholar (w/ Prof. Zachary C. Lipton)</b> <i>Carnegie Mellon University (CMU)</i>	August 2018 – January 2019 <i>Pittsburgh, PA</i>
<b>Honours Degree in Technology Management</b> <i>Center for Digital Technology and Management (CDTM)</i> <i>Technical University of Munich (TUM)</i> <i>Ludwig Maximilian University of Munich (LMU)</i>	August 2015 – June 2017 <i>Munich, Germany</i>
<b>Visiting Research Student (w/ Prof. Thomas W. Malone)</b> <i>Massachusetts Institute of Technology (MIT)</i> <i>Center for Collective Intelligence (CCI)</i>	February 2016 – June 2016 <i>Cambridge, MA</i>
<b>B.Sc. in Computer Science, Minor in Economic Sciences</b> <i>Technical University of Munich (TUM)</i>	October 2012 – October 2015 <i>Munich, Germany</i>

## WORK EXPERIENCE

---

<b>Intern Applied Scientist (Machine Learning)</b> <i>Amazon AI Labs</i>	September 2019 – July 2020 <i>Munich, Germany</i>
<ul style="list-style-type: none"><li>• Systematically assessed the impact of I/O representations for deep-learning-based time-series forecasting.</li></ul>	
<b>Intern Applied Scientist (Machine Learning)</b> <i>Amazon AI Labs</i>	May 2018 – August 2018 <i>Munich, Germany</i>
<ul style="list-style-type: none"><li>• Evaluated existing and developed new ML-based algorithms for large-scale lossless data compression.</li><li>• Implemented autoencoder-based probability distribution estimation for arithmetic coding on tabular data.</li></ul>	
<b>Intern Software Development Engineer</b> <i>Amazon – Core Machine Learning</i>	August 2017 – October 2017 <i>Berlin, Germany</i>
<ul style="list-style-type: none"><li>• Received an overview of standard time series analysis / forecasting techniques.</li><li>• Implemented Bayes by Backprop (weight uncertainty quantification) for plain MLPs and RNNs in MXNet.</li></ul>	
<b>Intern Software Development Engineer</b> <i>Amazon Web Services (AWS) – OpsWorks</i>	July 2016 – October 2016 <i>Berlin, Germany</i>
<ul style="list-style-type: none"><li>• Developed internal business intelligence tool (business metrics reporting and automated dashboard generation) for new OpsWorks service offering (OpsWorks for Chef Automate).</li></ul>	

## PUBLICATIONS

---

- Stephan Rabanser, Tim Januschowski, Valentin Flunkert, David Salinas, Jan Gasthaus. **The Effectiveness of Discretization in Forecasting: An Empirical Study on Neural Time Series Models.** Workshop on Mining and Learning from Time Series at KDD 2020. Oral presentation.
- Stephan Rabanser, Stephan Günnemann, Zachary C. Lipton. **Failing Loudly: An Empirical Study of Methods for Detecting Dataset Shift.** *Accepted to Neural Information Processing Systems (NeurIPS) 2019.* Previously presented at the DebugML Workshop at ICLR 2019.
- Stephan Rabanser, Oleksandr Shchur, Stephan Günnemann. **Introduction to Tensor Decompositions and Their Applications in Machine Learning.** *ArXiv e-prints (November 2017).* arXiv:stat.ML/1711.10781.
- CDTM Class of Fall 2015. **Entrepreneurship in Bavaria.** *Center for Digital Technology and Management (CDTM).* ISBN: 978-3-9815538-9-5. 2015.

## TECHNICAL STRENGTHS

---

**Programming Languages**  
**ML Frameworks**  
**Tools**

Python, Java, Swift, Ruby, C, HTML5/CSS3/JS  
Keras, TensorFlow, MXNet, sklearn  
Git, IDEA Suite, Jupyter, Xcode, Sketch

## AWARDS & HONORS

---

**ICLR 2019 Student Volunteer** May 2019  
**NeurIPS 2018 Student Volunteer** December 2018  
**Member of the Elite Network of Bavaria** Since April 2016  
**Apple Worldwide Developers Conference (WWDC)** June 2013  
*Student Scholarship Recipient* San Francisco, CA

- Developed résumé iOS app to highlight academic and professional experience as well as hobbies.
- Got awarded a free WWDC ticket.

## SELECTED COURSEWORK & PRIOR RESEARCH EXPERIENCE

---

**Data Shifts and Distribution Change Point Detection** August 2018 – July 2019  
*Master's Thesis Project – CMU & TUM* Pittsburgh, PA & Munich, Germany

- Conducted research on dataset shift detection, characterization, and malignancy quantification between training and testing environments.
- Set up a large-scale empirical study to evaluate shift detection potential using statistical two-sample testing on various latent representations.
- Accepted to Neural Information Processing Systems (NeurIPS) 2019.

**Denosing Spectral Clustering Through Latent Data Decomposition** October 2017 – March 2018  
*Guided Research – Professorship of Data Mining and Analytics, TUM* Munich, Germany

- Developed two new methods to make spectral clustering more robust (reduced sensitivity to noise).
- Modeled problem as latent data decomposition instead of similarity graph decomposition.
- Initial results outperform similar techniques on many datasets, but extensive hyper-parameter tuning is needed.

**Data Science in Astrophysics and Industry** March 2017 – July 2017  
*Interdisciplinary Project – Max Planck Institute for Astrophysics (MPA)* Munich, Germany

- Transformed an existing Gaussian mixture model (GMM) into Google TensorFlow.
- Optimized the algorithmic implementation of the model (e.g. number of mixture components, hyper-parameters).
- Explored different training methods (stochastic vs. deterministic and expectation maximization (EM) vs. gradient descent vs. Newton).
- Determined parallelizable operations and to which extend sync points are needed.
- Researched, implemented, and improved online learning techniques for GMMs and compared them to standard EM and tensor decomposition approaches.

**Teaching Assistant** August 2014 – November 2014  
*Swift Introduction Course – Chair for Applied Software Engineering, TUM* Munich, Germany

- Held a 2h talk and prepared the corresponding tutorial about RESTful interaction with web services within iOS and OS X apps.
- Developed a course-matching sample API by using Java technologies (Maven, Glassfish, Jersey, JPA).
- Supported course administration by writing and reviewing course assignments.
- Highlighted by Apple as one of the first Swift courses at major universities.

## LANGUAGES

---

**German** Native  
**English** Fluent, TOEFL iBT 112 (November 2018)  
**Italian** Proficient