

STEPHAN RABANSER

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EDUCATION

M.Sc. in Computer Science, Focus on Machine Learning <i>Technical University of Munich (TUM)</i>	October 2015 – July 2019 <i>Munich, Germany</i>
Visiting Research Scholar <i>Carnegie Mellon University (CMU)</i>	August 2018 – January 2019 <i>Pittsburgh, PA</i>
Honours Degree in Technology Management <i>Center for Digital Technology and Management (CDTM)</i>	August 2015 – July 2019 <i>Munich, Germany</i>
Visiting Research Student <i>Massachusetts Institute of Technology (MIT)</i>	February 2016 – June 2016 <i>Cambridge, MA</i>
B.Sc. in Computer Science, Minor in Economic Sciences <i>Technical University of Munich (TUM)</i>	October 2012 – October 2015 <i>Munich, Germany</i>
Higher Education Entrance Qualification (A-levels) <i>Technologische Fachoberschule “Max Valier”</i>	September 2007 – July 2012 <i>Bolzano, Italy</i>

WORK EXPERIENCE

Intern Applied Scientist (Machine Learning) <i>Amazon AI Labs</i>	May 2018 – August 2018 <i>Munich, Germany</i>
<ul style="list-style-type: none">• Evaluated existing and developed new ML-based algorithms for large-scale lossless data compression.• Implemented autoencoder-based probability distribution estimation for arithmetic coding on tabular data.	
Intern Software Development Engineer <i>Amazon – Core Machine Learning</i>	August 2017 – October 2017 <i>Berlin, Germany</i>
<ul style="list-style-type: none">• Received an overview of standard time series analysis / forecasting techniques.• Implemented Bayes by Backprop (weight uncertainty quantification) for plain MLPs and RNNs in MXNet.• Contributed two chapters to upcoming MXNet book.	
Intern Software Development Engineer <i>Amazon Web Services (AWS) – OpsWorks</i>	July 2016 – October 2016 <i>Berlin, Germany</i>
<ul style="list-style-type: none">• Developed internal business intelligence tool (business metrics reporting and automated dashboard generation) for new OpsWorks service offering (OpsWorks for Chef Automate).• Gained deep insights into a broad range of AWS products and large-scale software development at Amazon.	

PUBLICATIONS

- Stephan Rabanser, Stephan Günnemann, Zachary C. Lipton. **Failing Loudly: An Empirical Study of Methods for Detecting Dataset Shift**. *ArXiv e-prints (October 2018)*. arXiv:stat.ML/1810.11953. Submitted to the International Conference on Machine Learning (ICML) 2019. Accepted to and 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	Python, Java, Swift, Ruby, C, HTML5/CSS3/JS
ML Frameworks	Keras, TensorFlow, MXNet, sklearn
Tools	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) <i>Student Scholarship Recipient</i>	June 2013 <i>San Francisco, CA</i>
<ul style="list-style-type: none">• 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 <i>Master's Thesis – CMU & TUM</i>	August 2018 – July 2019 <i>Pittsburgh, PA & Munich Germany</i>
<ul style="list-style-type: none">• Currently conducting research on dataset shift and distribution change point detection between training and testing environments.• Set up a large-scale empirical study on efficient shift estimation, shift pinpointing, and shift correction.	
Denoising Spectral Clustering Through Latent Data Decomposition <i>Guided Research – Professorship of Data Mining and Analytics, TUM</i>	October 2017 – March 2018 <i>Munich, Germany</i>
<ul style="list-style-type: none">• 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 <i>Interdisciplinary Project – Max Planck Institute for Astrophysics (MPA)</i>	March 2017 – July 2017 <i>Munich, Germany</i>
<ul style="list-style-type: none">• 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.	
Prototyper <i>Bachelor's Thesis Project – Chair for Applied Software Engineering, TUM</i>	May 2015 – October 2015 <i>Munich, Germany</i>
<ul style="list-style-type: none">• Developed a workflow and a web service which enables continuous delivery of executable prototypes in early requirements engineering.• Project will be developed further with theses, guided research projects, and student assistant positions.	
Teaching Assistant <i>Swift Introduction Course – Chair for Applied Software Engineering, TUM</i>	August 2014 – November 2014 <i>Munich, Germany</i>
<ul style="list-style-type: none">• 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