Stephan Rabanser

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Education

M.Sc. in Computer Science, Focus on Machine Learning — October 2015 – February 2019 (exp.)
Technical University of Munich (TUM) — *Munich, Germany*

Visiting Research Scholar — August 2018 – January 2019 (exp.)
Carnegie Mellon University (CMU) — *Pittsburgh, PA*

Honours Degree in Technology Management — August 2015 – February 2019 (exp.)
Center for Digital Technology and Management (CDTM) — *Munich, Germany*

Visiting Research Student — February 2016 – June 2016
Massachusetts Institute of Technology (MIT) — *Cambridge, MA*

B.Sc. in Computer Science, Minor in Economic Sciences — October 2012 – October 2015
Technical University of Munich (TUM) — *Munich, Germany*

Higher Education Entrance Qualification (A-levels) — September 2007 – July 2012
Technologische Fachoberschule "Max Valier" — *Bolzano, Italy*

Work Experience

Intern Applied Scientist (Machine Learning) — May 2018 – August 2018
Amazon AI — *Munich, Germany*

- Evaluated existing and develop new machine learning based algorithms for large-scale lossless data compression.
- Implemented autoencoder-based probability distribution estimation for arithmetic coding on tabular data.

Intern Software Development Engineer — August 2017 – October 2017
Amazon – Core Machine Learning — *Berlin, Germany*

- Received an overview of standard time series analysis / forecasting techniques.
- Implemented Bayes by Backprop (weight uncertainty quantification) for standard MLPs and RNNs in MXNet.
- Contributed two chapters to upcoming MXNet book.

Intern Software Development Engineer — July 2016 – October 2016
Amazon Web Services (AWS) – OpsWorks — *Berlin, Germany*

- 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. 2018. **Failing Loudly: An Empirical Study of Methods for Detecting Dataset Shift**. *ArXiv e-prints (October 2018).* arXiv:stat.ML/1810.11953.
- Stephan Rabanser, Oleksandr Shchur, Stephan Günnemann. 2017. **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. 2015. **Entrepreneurship in Bavaria**. *Center for Digital Technology and Management.* ISBN: 978-3-9815538-9-5.

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

Languages

German	Native
English	Fluent, TOEFL iBT 104 (October 2014)
Italian	Proficient

Awards & Honors

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, USA*

- 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 – February 2019 (exp.)
Master Thesis, Carnegie Mellon University *Pittsburgh, PA*

- 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.
- Submitted preliminary findings to NIPS workshops.

Denoising Spectral Clustering Through Latent Data Decomposition October 2017 – March 2018
Guided Research, Professorship of Data Mining and Analytics *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 *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.

Stylight Now, Tech Lead October 2015 – January 2016
Managing Product Development – CDTM *Munich, Germany*

- Developed a simple and easy direct checkout solution for the fashion aggregator Stylight to raise the conversion rate throughout their platform, but especially in their apps.
- Created iOS app (UI/UX + code) which will be further refined by Stylight and eventually incorporated into their live platform.
- Got hands on experience with business development strategies, user and market research, project management, and collaboration in a diverse team.

Prototyper May 2015 – October 2015
Bachelor's Thesis Project – Chair for Applied Software Engineering *Munich, Germany*

- 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 August 2014 – November 2014
Swift Introduction Course – Chair for Applied Software Engineering *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.