Thomas Kipf

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Education

- **University of Amsterdam** — Amsterdam, The Netherlands
  PhD candidate (current) — *since Apr 2016*
  - PhD candidate in Deep Learning for Network Analysis at the Amsterdam Machine Learning Lab (AMLab), supervised by Prof. Max Welling

- **University of Erlangen-Nuremberg** — Erlangen, Germany
  M.Sc. (honors) Physics — *Apr 2014 - Mar 2016*
  - Graduated with distinction, GPA 3.97/4.0[1] (German grading system: 1.03)
  - Honors graduate program 'Physics Advanced', supported by the Elite Network of Bavaria

- **University of Erlangen-Nuremberg** — Erlangen, Germany
  B.Sc. Physics — *Apr 2011 - Mar 2014*
  - Graduated with distinction, GPA 3.93/4.0[1] (German grading system: 1.07)

Research experience

- **PhD Candidate (University of Amsterdam)** — Amsterdam, The Netherlands
  Amsterdam Machine Learning Lab (Prof. Max Welling) — *since Apr 2016*
  - Semi-Supervised Classification with Graph Convolutional Networks:

    In this project, I revisited the problem of graph-based semi-supervised learning and approached it with a novel neural network model that operates directly on graph-structured data, achieving state-of-the-art classification results on citation network datasets and knowledge graphs. This work will be presented at ICLR 2017.
  - Variational Graph Auto-Encoders:

    The focus of this project was to develop a scalable neural network-based algorithm for unsupervised learning on graph-structured data. The resulting model is inspired by the variational auto-encoder and was presented at the Bayesian Deep Learning Workshop at NIPS 2016.

- **Research Intern (Max Planck Institute for Brain Research)** — Frankfurt, Germany
  M.Sc. thesis in Connectomics Department (Dr. Moritz Helmstaedter) — *Feb 2015 - Mar 2016*
  - RNNs for Graph-Based 3D Agglomeration of 3D-EM image data

- **Visiting Researcher (Oklahoma State University)** — Stillwater, OK
  Theoretical Quantum Optics Group (Prof. Girish S. Agarwal) — *Spring 2014*
  - Developed an analytical model for collective effects in optically driven nano-oscillators

[1] Converted from German GPA using the *modified Bavarian formula*:
http://www.tum.de/en/studies/application-and-acceptance/grade-conversion-formula-for-grades-earned-outside-germany/

Publications

- T. N. Kipf and M. Welling, *Semi-Supervised Classification with Graph Convolutional Networks*, ICLR (2017).
- T. N. Kipf and M. Welling, *Variational Graph Auto-Encoders*, Bayesian Deep Learning Workshop at NIPS (2016).
- T. Kipf and G. S. Agarwal, *Superradiance and Collective Gain in Multimode Optomechanics*, Physical Review A 90, 053808 (2014).

Presentations

- **Deep Learning on Graphs with Graph Convolutional Networks**
  - Invited talk at Amsterdam Deep Learning & AI Meetup by Scyfer . . . . . May 10, 2017
  - Invited talk at Machine Learning Netherlands Meetup by IMC Amsterdam . . Apr 6, 2017
  - Invited talks at INRIA Nancy . . . . . Mar 22 & 23, 2017
  - Invited talk at VU University Medical Center Amsterdam . . . . . Mar 6, 2017
  - Invited talk at SAP Innovation Center Potsdam (remotely) . . . . . Feb 14, 2017
  - Invited talk at INRIA Lille . . . . . Dec 15, 2016
  - Poster presentation at Deep Learning Summer School, Montreal . . . . . Aug 6, 2016
- **Unsupervised Learning with Latent Variable Models**
  Guest lecture, Machine Learning I, University of Amsterdam — Oct 10, 2016

Workshops and summer schools

- **Machine Learning Summer School 2017** — Tübingen, Germany
  Summer school participation; poster presentation — *June 19-30, 2017*
- **Google Machine Learning Summit 2017** — Zürich, Switzerland
  Selected for participation (80 PhD students/post-docs), poster presentation — *June 12-14, 2017*
- **Deep Learning Summer School 2016** — Montreal, Canada
  Summer school participation; selected for poster presentation — *Aug 1-7, 2016*
- **65th Lindau Nobel Laureate Meeting (Interdisciplinary)** — Lindau, Germany
  Participation as a Young Scientist — *Jun 28-Jul 3, 2015*
- **Modern Issues in Foundations of Physics** — London, UK
  Workshop at Imperial College London — *Sep 26-28, 2014*

Awards, grants and honours

ICLR 2017 travel award ($400) 2017
CIFAR travel scholarship for Deep Learning Summer School ($500) 2016
Elite Network of Bavaria sponsorship for 65th Lindau Nobel Laureate Meeting (€5 000) 2015
Full scholarship by the German National Academic Foundation (€25 500) . . . . . 2013 - 2016
Leonardo-Kolleg (Scholarship for academic achievements at Univ. of Erlangen-Nürnberg) 2012 - 2016
Deutschlandstipendium (Germany Scholarship) (€7 200) . . . . . 2011 - 2013
Deutscher Gründerpreis (German Business Founder Award for Students) (€800) 2008

Student supervision

- **Mart van Baalen (Master thesis, jointly with Max Welling)** University of Amsterdam
  Deep Matrix Factorization for Recommendation *Graduation: Oct 14, 2016*

Selected course work (2011 - 2014)

- **Mathematics:**
  - Analysis and Linear Algebra
  - Calculus for Physicists I - III
- **Physics:**
  - Experimental Physics I - VI
  - Theoretical Physics I - V
  - Lab Sessions
- **Computer Science and others:**
  - Complex Systems I - III
  - Computational Physics I - II
  - Bioinformatics
  - Machine Learning (Coursera, with certificate)

Miscellaneous

- **Teaching:** Machine Learning I, 2016 (University of Amsterdam)
- **Programming skills:** Python, MATLAB, C++ (some experience)
- **Frameworks:** TensorFlow, Theano, keras (with contributions), (Py)Torch (some experience)
- **Reviewer activity:** 14th European Conference on Computer Vision (ECCV), 2016
- **Research interests:** (Bayesian) deep learning, graph theory, semi-supervised learning, (large-scale) inference, reasoning, and multi-agent communication