Didrik Nielsen | Curriculum Vitae

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MSc in Applied Physics and Mathematics. Passionate about *machine learning*, in particular probabilistic approaches. Interested in the development and evaluation of probabilistic models, as well as design of approximate inference methods.

Education

Technical University of Denmark (DTU) **Copenhagen, Denmark**
PhD Student *January 2019–December 2021*

Researching Unsupervised Deep Learning with Prof. Ole Winther.

University of Amsterdam (UvA) **Amsterdam, Netherlands**
Visiting PhD Student *January 2020–June 2020*

Visiting AMLAB, working with Prof. Max Welling.

Norwegian University of Science and Technology (NTNU) **Trondheim, Norway**
MSc Applied Physics and Mathematics, Average Grade: A *August 2011–December 2016*

Main profile: Industrial Mathematics. Specialization: Statistics.

National University of Singapore (NUS) **Singapore, Singapore**
Exchange Student, Average Grade: A- *January 2015–May 2015*

Employment

DTU Compute **Copenhagen, Denmark**
Research Assistant *September 2018–December 2018*

- Working on a project with the start-up raffle.ai.
- Developing corporate virtual assistants using *information retrieval*, *natural language processing* and *deep learning*.

Center for Advanced Intelligence Project (AIP), RIKEN **Tokyo, Japan**
Research Assistant *March 2017–August 2018*

- Working with Mohammad Emtiyaz Khan in the Approximate Bayesian Inference (ABI) team.
- Conducting research with a focus on *variational inference* and *Bayesian neural networks*.
  · Contributed to three conference papers, one arXiv paper and two workshop papers.

Norwegian Computing Center **Oslo, Norway**
Summer Intern *June 2016–July 2016*

- Summer internship in the Statistical Analysis, Machine Learning and Image Analysis (SAMBA) department.
- Working on a research project on fraud detection.

Norsk Hydro **Oslo, Norway**
Summer Intern *June 2015–August 2015*

- Summer internship in the Energy Markets department.
- Developing trading strategies for energy markets using machine learning.

If P&C Insurance **Oslo, Norway**
Summer Intern *June 2014–August 2014*

- Summer internship in the Motor Insurance department.
- Analysis of trends in insurance claims and the effects of a marketing campaign.

Teaching & Invited Talks

○ **AMLAB Seminar** — **Amsterdam, Netherlands**
Invited Talk — *September 2020*
I gave a talk about our recent paper *SurVAE Flows: Surjections to Bridge the Gap between VAEs and Flows*.

○ **Technical University of Denmark** — **Copenhagen, Denmark**
Teaching Assistant — *September 2019–December 2020*
I was a teaching assistant in the *Deep Learning* course in both 2019 and 2020.

○ **Data Science Summer School** — **Paris, France**
Teaching Assistant — *June 2018*
I was a TA in the two-day tutorial on Approximate Bayesian Inference at the Data Science Summer School 2018.

○ **Works Applications** — **Tokyo, Japan**
Invited Talk — *May 2018*
I gave a one-hour introduction to the field of Bayesian Deep Learning at the headquarters of Works Applications.

○ **Norwegian University of Science and Technology** — **Tronhdeim, Norway**
Teaching Assistant — *January 2013–December 2016*
I held in total 7 teaching assistant positions in courses on statistics, calculus, finance and fluid mechanics.

Extracurricular Activities

○ **Machine Learning Conferences** — **Online**
Reviewer — *June 2019–*
I served as a reviewer for NeurIPS 2019, ICML 2020, NeurIPS 2020.

○ **Bedriftskontakten Nabla** — **Tronhdeim, Norway**
Business Contact — *April 2013–April 2014*
I volunteered as a business contact in the student association. This work included contacting companies and organizing company presentations.

○ **Hans Majestet Kongens Garde** — **Oslo, Norway**
Guard Soldier — *July 2010–July 2011*
Compulsory military service. I served one year as a guard soldier in the Royal Guard.

Selected Publications

○ *SurVAE Flows: Surjections to Bridge the Gap between VAEs and Flows*.
D. Nielsen, P. Jaini, E. Hoogeboom, O. Winther, M. Welling (NeurIPS, 2020) (Oral presentation).

○ *Closing the Dequantization Gap: PixelCNN as a Single-Layer Flow*.
D. Nielsen, O. Winther (NeurIPS, 2020).

○ *SLANG: Fast Structured Covariance Approximations for Bayesian Deep Learning with Natural Gradient*.
A. Mishkin, F. Kunstner, D. Nielsen, M. Schmidt, M.E. Khan (NeurIPS, 2018).

○ *Fast yet Simple Natural-Gradient Descent for Variational Inference in Complex Models*
M.E. Khan, D. Nielsen (ISITA, 2018).

○ *Fast and Scalable Bayesian Deep Learning by Weight-Perturbation in Adam*.
M.E. Khan, D. Nielsen, V. Tangkaratt, W. Lin, Y. Gal, A. Srivastava (ICML, 2018).

Skills

○ **Languages:** Norwegian, English.
○ **Programming Languages:** Python, R, MATLAB, C++.
○ **Frameworks & Libraries:** PyTorch, TensorFlow.
○ **Tools:** LaTeX, Git.