

# Didrik Nielsen | Curriculum Vitae

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

## Education

- **Danish Technical University (DTU)** **Copenhagen, Denmark**  
*PhD Student* *January 2019–*  
Project: Flexible Densities for Deep Generative Models.  
Supervisor: Prof. Ole Winther.  
Co-supervisor Assoc. Prof. Mikkel Schmidt.
- **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 as a research assistant at DTU Compute with Prof. Ole Winther.
  - Allocated to a project with the start-up raffle.ai. Tasks:
    - 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 in the Approximate Bayesian Inference (ABI) team.
  - Working with Mohammad Emtiyaz Khan in research with a focus on variational inference. Tasks:
    - Participate in the generation, execution and communication of research ideas.
    - Contributed to three conference papers, one arXiv paper and two workshop papers.
- **Norwegian Computing Center** **Oslo, Norway**  
*Assistant Research Scientist* *June 2016–July 2016*
  - Summer job in the Statistical Analysis, Machine Learning and Image Analysis (SAMBA) department.
  - Working on a research project on fraud detection. Tasks:
    - Clustering of insurance policies.
    - Hyperparameter tuning for predictive models.
    - Social network analysis of customer transactions.
- **Norsk Hydro** **Oslo, Norway**  
*Summer Intern* *June 2015–August 2015*
  - Summer internship in the Energy Markets department.
  - Developing trading strategies for energy markets. Tasks:
    - Prepare and clean data, both technical indicators and fundamental factors.
    - Use machine learning methods to generate trading recommendations.
- **If P&C Insurance** **Oslo, Norway**  
*Summer Intern* *June 2014–August 2014*
  - Summer internship in the Motor Insurance department. Tasks:
    - Analyzing trends in insurance claims.
    - Analyzing the effects of a marketing campaign.

## Teaching & Invited Talks

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- **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** **Trondheim, Norway**  
*Teaching Assistant* *January 2013–December 2016*  
I held in total 7 teaching assistant positions in courses on statistics, calculus, finance and fluid mechanics. Tasks included weekly guidance of students as well as marking of exercises.

## Extracurricular Activities

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- **Bedriftskontakten Nabla** **Trondheim, 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.

## Publications

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- A. Mishkin, F. Kunstner, D. Nielsen, M. Schmidt, M.E. Khan. SLANG: Fast Structured Covariance Approximations for Bayesian Deep Learning with Natural Gradient. *NIPS*, 2018.
- M.E. Khan, D. Nielsen. Fast yet Simple Natural-Gradient Descent for Variational Inference in Complex Models. *ISITA*, 2018.
- M.E. Khan, D. Nielsen, V. Tangkaratt, W. Lin, Y. Gal, A. Srivastava. Fast and Scalable Bayesian Deep Learning by Weight-Perturbation in Adam. *ICML*, 2018.
- M.E. Khan, W. Lin, V. Tangkaratt, Z. Liu and D. Nielsen. Variational Adaptive-Newton Method for Explorative Learning. *ArXiv e-prints*, 2017.
- M.E. Khan, W. Lin, V. Tangkaratt, Z. Liu and D. Nielsen. Variational Adaptive-Newton Method. NIPS Workshop on Advances in Approximate Bayesian Inference, Los Angeles, USA, 2017.
- W. Lin, M.E. Khan, N. Hubacher and D. Nielsen. Natural-Gradient Stochastic Variational Inference for Non-Conjugate Structured Variational Autoencoder. ICML Workshop on Deep Structured Prediction, Sydney, Australia, 2017.
- D. Nielsen. *Tree Boosting with XGBoost - Why does XGBoost win "every" machine learning competition?* Master's Thesis, Norwegian University of Science and Technology, 2017.

## Skills

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