Alexander **Johansen**

Stanford · California · USA

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Research Interest

I am interested in understanding and quantifying the human body through gathering and analyzing health data. Currently, I am excited about the opportunities with affordable sensor technologies and at-home micro sampling devices for multi-omics profiling. I investigate these fields through my role as a Ph.D. student in the Snyder lab at Stanford where I lead the Stanford Center for Personalized Health (stanford-health.github.io). Previously I have conducted and supervised research in the field of bioinformatics (protein structure and function), diabetes glucose monitoring, and building generalizable neural components for machine learning.

Education

Stanford University
Stanford, California, USA

Ph.D. Computer Science — *Sep 2020 - est. Jun 2026*

- **Advised by Professor Michael P. Snyder**
- **2020 Fulbright Scholar**

Technical University of Denmark
Kongens Lyngby, Denmark

M.Sc. Mathematical Modeling and Computation, GPA: 11.44/12.00 — *Sep 2014 - Dec 2016*

- **Nanyang Technological University**, Singapore — *Semester Abroad Fall 2015*
- **Honors program**, Supervised by Professor Ole Winther

Copenhagen Business School
Frederiksberg, Denmark

B.Sc. Business Administration and Information Systems, GPA: 10.70/12.00 — *Sep 2011 - Jun 2014*

- **Lincoln University**, Canterbury, New Zealand — *Semester Abroad Fall 2013*

Experience

Stanford University
Stanford, California, USA

Stanford Center for Personalized Health — *Juli 2021 -*

As a part of my Ph.D. I founded, and am currently managing, the Stanford Center for Personalized Health where I organize research projects om quantifying the human body. Beyond me, the lab currently includes eight researchers (4 high school, 1 undergraduate, 1 independent, 1 PhD, 1 Post Doc) and project collaborators from the Snyder lab and the Stanford School of Medicine. We meet every week and the research agenda and current roster can be found at `stanford-health.github.io`.

Ocean.io
Copenhagen, Denmark

Head of Data Science Research — *Feb 2020 - est. Sep 2020*

Developing and deploying state-of-the-art NLP projects at scale. Time divided between Copenhagen, Denmark and Kiev, Ukraine.

Technical University of Denmark
Kongens Lyngby, Denmark

Research Project Manager — *Jan 2019 - Jan 2020*

Inspired by my time at Salesforce Research, I started a student based research lab with research meetings every Tuesday and one-on-ones every Thursday. More than 30 students (M.Sc. and Ph.D.) have participated in the lab in 2019 resulting in several publications. To find research projects I collaborated with professors and Ph.D. students at the university on hot topics and datasets. The majority of the participants had previously done projects with me in the 02456 Deep Learning course.

Salesforce
Palo Alto, California, USA

Deep Learning Research, Intern — *Jan 2017 - Jan 2018*

Under the supervision of Richard Socher (Salesforce Research) I researched in probability based decision making (+100k impression blogpost, ACL workshop paper); multi-task learning for NLP; and mixture-of-experts using distributed computing, PyTorch, and TorchText.

Teaching

Technical University of Denmark
Head TA

Deep Learning, 02456 — *Fall 2016, Fall 2018, Fall 2019*

In 2018 and 2019 I was the head TA with significant course material contributions. Half of the course is project based and I supervised the NLP, Bioinformatics, and RL projects; the most popular amongst students for 2018 and 2019.

Co-Supervisor

Master Thesis Supervision *Spring 2019, Fall 2019, Spring 2020*

I have co-supervised 16 Master Thesis projects (an M.Sc. thesis is 5 months full-time). The thesis' have investigated formal languages, Levenhstein transformer, multi task learning, exploration in VQA, bio-/, and cheminformatics; resulting in multiple arcademic contributions.

Co-Supervisor

Special Courses *Spring 2019, Fall 2019*

I have supervised 11 special course projects (a special course is 4 months part-time). Similar to M.Sc. thesis, the special courses have investigated topics within deep learning methods and applications.

Course Responsible

Intro Reinforcement Learning *Spring 2019*

Exercises from Chap 1-13 in Sutton & Barto and Homework 1-2 from UC Berkeley's Deep RL course. 9 Students (M.Sc. and Ph.D.).

Course Co-Responsible

Deep Reinforcement Learning *Jun. 2019*

Adjusted version of UC Berkeley's Deep RL course, co-supervised with Ass. Prof. T. Herlau. 10 students (M.Sc. and Ph.D.).

Community

Deep Learning Copenhagen

MeetUp

Founder *Nov. 2018 - Dec. 2019*

Inspired by Stanford's public poster exam in CS224N in 2017 I convinced Professor Ole Winther to do the same for our 02456 Deep Learning course. With student posters, company sponsored first prize, drinks, and pizza. Given the positive feedback, I was hired by the university, started a research lab for students, and kept hosting events to celebrate the students projects. This was a lot of fun and resulted in seven events, +1.5k participants, and multiple company sponsorships. (Event page: `https://www.meetup.com/Deep-Learning-DTU/`).

Community research

Zoom

Founder *Jan. 2020 - now*

I help independent researchers who wants to pursue graduate studies and provide free supervision and problem statements to help them publish papers and get recognized.

Open Source

Google TensorFlow

contrib.seq2seq: #4761, #4686, #4382

TensorFlow tutorial (2k stars): `https://github.com/alrojo/tensorflow-tutorial`

Academic Reviews

2021	**PNAS,** Proceedings of the National Academy of Sciences of the United States of America	*Assisted review*
2021	**Bioinformatics,**	*Reviewer*
2020	**ICLR,** International Conference on Learning Representations	*Program committee*
2020	**ACL,** Association for Computational Linguistics	*Reviewer*
2020-21	**AAAI,** Association for the advancement of artificial intelligence	*Program committee*
2018-20	**CoNLL,** Computational Natural Language Learning	*Reviewer*
2017	**NIPS,** Neural Information Processing Systems	*Assisted review*
2017	**ICML,** International Conference on Machine Learning	*Assisted review*

Journal Publications

Prediction of GPI-Anchored proteins with pointer neural networks

PUBLISHED

Current Research in Biotechnology *2021*

`https://www.sciencedirect.com/science/article/pii/S2590262821000010`

M. Gíslason, H. Nielsen, J. Armenteros*, A. Johansen* (*equal contribution)

An introduction to deep learning on biological sequence data: examples and solutions

PUBLISHED

Bioinformatics (IF: 6.9) Volume 33, Issue 22, Pages 3685-3690, Oxford University Press *2017*

`https://academic.oup.com/bioinformatics/article/33/22/3685/4092933`

V. Jurtz, A. Johansen, M. Nielsen, J. Armenteros, H. Nielsen, C. Sønderby, O. Winther and S. Sønderby

Conference Publications

Short term blood glucose prediction based on continuous glucose monitoring data *POSTER*

IEEE Engineering in Medicine and Biology Society (EMBC) *2020*

https://arxiv.org/abs/2002.02805

A. Mohebbi, A. Johansen, N. Hansen, P. Christensen, M. Jensen, J. Tarp, H. Bengtsson, M. Mørup

Neural arithmetic units *SPOTLIGHT (top 6%)*

International Conference on Learning Representations *2020*

https://openreview.net/forum?id=H1gNOeHKPS

A. Madsen, A. Johansen

Deep recurrent conditional random field for protein secondary structure prediction *ORAL*

ACM Conference on Bioinformatics, Computational Biology, and Health Informatics *2017*

http://delivery.acm.org/10.1145/3110000/3107489/p73-johansen.pdf

A. Johansen, C. Sønderby, S. Sønderby and O. Winther

A deep learning approach to adherence detection for type 2 diabetics *POSTER*

IEEE Engineering in Medicine and Biology Society (EMBC) *2017*

https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7471776

A. Mohebbi, T. Aradóttir , A. Johansen, H. Bengtsson, M.Fraccaro, M. Mørup

Epileptiform spike detection via convolutional neural networks *POSTER*

IEEE International Conference on Acoustics, Speech and Signal Processing *2016*

https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8037462

A. Johansen, J. Jin, T. Maszczyk, J. Dauwels, S. Cash and M. Westover

Workshop and Abstract Publications

Measuring arithmetic extrapolation performance *POSTER*

NeurIPS Workshop on Science meets Engineering of Deep Learning *2019*

https://arxiv.org/abs/1910.01888

A. Madsen, A. Johansen

Language modeling for biological sequences — curated datasets and baselines *POSTER*

NeurIPS Workshop on Learning Meaningful Representations of Life *2019*

J. Armenteros, A. Johansen, O. Winther, H. Nielsen

Learning the language of life *ORAL*

Intelligent Systems for Molecular Biology / European Conference on Computational Biology *2019*

https://orbit.dtu.dk/files/193584092/Learning_the_language_of_life_abstract.pdf

J. Armenteros, A. Johansen, O. Winther, H. Nielsen

Learning when to skim and when to read *POSTER*

ACL Workshop on Representation Learning for NLP *2017*

https://arxiv.org/abs/1712.05483

A. Johansen, R. Socher

Neural machine translation with characters and hierarchical encoding *POSTER*

NIPS Recurrent Neural Network Symposium *2016*

https://arxiv.org/abs/1610.06550

A. Johansen, J. Hansen, E. Obeid, C. Sønderby and O. Winther

Projects under review

SignalP 6.0 achieves signal peptide prediction across all types using protein language models *UNDER REVIEW*

Submitted for Nature Biotechnology (IF: 54.9) *2021*

https://www.biorxiv.org/content/10.1101/2021.07.21.453084v1

F. Teufel, J. Armenteros, A. Johansen, M. Gislason, S. Pihl, K. Tsirigos, S. Brunak, G. Heijne, H. Nielsen

NetSolP: predicting protein solubility in E. coli using language models *UNDER REVIEW*

Submitted for Bioinformatics (IF: 6.9) *2021*

https://www.biorxiv.org/content/10.1101/2021.07.21.453084v1

V. Thumuluri, H. Martiny, J. Armenteros, J. Salomon, H. Nielsen, A. Johansen

Predicting recombinant gene expression with deep learning techniques *UNDER REVIEW*

Submitted for Computational Biology and Chemistry (IF: 2.8) *2021*

https://www.biorxiv.org/content/10.1101/2021.05.13.443426v1

H. Martiny, J. Armenteros, A. Johansen, J.Salomon, H. Nielsen

Patents

Probability-Based Guider *PENDING*

US Patent App. 15/853,530 *2017*

A. Johansen, B. McCann, J. Bradbury, R. Socher

Deep Neural Network-Based Decision Network *PENDING*

US Patent App. 15/853,570 *2017*

A. Johansen, B. McCann, J. Bradbury, R. Socher

Technical Skills

Programming Python, Matlab, SQL
ML Frameworks PyTorch, TensorFlow, Theano, Lasagne, CUDA
Others Linux, Docker, Vim, IPythonNotebook, Google Colab, Git, Github, AWS S3, AWS EC2, LaTeX