



# Dan Saatrup Nielsen

## Senior AI Specialist

### Contact

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### Key Skills

Machine Learning  
Natural Language Proc  
Graph Machine Learning  
Uncertainty Estimation  
Python  
Linux

### Languages

English  
Danish

### Profile

I am a data scientist with specialised knowledge of machine learning methods, in particular Natural Language Processing (NLP) and Graph Neural Networks. I have a PhD in Mathematics and have a strong interest within Scandinavian NLP. With a background in both academia and industry, I am in tune with the demands of each. I am incredibly ambitious and love what I am doing, and I tend to take a lot of initiative to new projects and to look at things from new angles.

### Experience

*June 2022—Present*

Senior AI Specialist • The Alexandra Institute

This role is split 50/50 between a research role, in which I'm primarily working with NLP research for the Scandinavian languages, and an ML consulting role where I use this research knowledge to help Danish companies implement state-of-the-art machine learning methods to optimise and/or improve their workflows.

*March 2022—June 2022*

Machine Learning Consultant • Blackbird.ai

Contracting work on improving Blackbird.ai's misinformation detection algorithms.

*May 2021—June 2022*

Research Associate in Machine Learning • University of Bristol

Worked on the CLARITI project, in which I used graph neural networks and multimodal machine learning methods to analyse and predict the spread of misinformation on social media channels.

*June 2020—May 2021*

Senior Machine Learning Consultant • Danish Business Authority

A part of the machine learning lab, in which I utilised graph algorithms and built machine learning models to detect tax fraud.

*February 2020—May 2020*

Machine Learning Specialist • LYS Technologies Limited

In charge of the machine learning efforts at LYS. The main task was building the LYS Light Engine, which is using data collected through thousands of LYS's proprietary light sensors to predict optimal individualised lighting at a given time.

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*February 2017—February 2020*

Teaching Assistant • University of Bristol

In charge of weekly exercise sessions for mathematics undergraduate students, covering various mathematics courses as well as LaTeX and Python.

*September 2019—January 2020*

AI Researcher • Barbal Limited

Developing natural language processing models to enhance Barbal, a word processing web app made for large scale collaboration on technical documents.

*February 2019—March 2019*

Visiting Researcher • University of Rutgers

Visiting Professor Grigor Sargsyan to work on a joint paper in mathematical logic.

*April 2018—May 2018*

Assistant Lecturer • University of Bristol

I gave five lectures in the third-year logic unit MATH30100 to ~50 undergraduate students, covering basic computability theory and the incompleteness theorems.

*January 2014—July 2016*

Teaching Assistant • University of Copenhagen

In charge of weekly exercise sessions with ~30 undergraduate mathematics students.

*January 2014—July 2016*

Junior Programmer • GE Revision & Rådgivning

Automated the company's accounting process, reducing manual Excel labour from ~5 hours per account down to a minute per account.

Developed cash register software which allowed day-to-day updates of cash flow from the company's clients.

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## Education

*July 2016—March 2020*

PhD in Mathematics • University of Bristol

PhD thesis: "Virtual Set Theory: Taking the Blue Pill", advised by Philip Welch. My thesis was prize nominated for "Outstanding Excellence in a Doctoral Dissertation".

*September 2014—July 2016*

MSc in Mathematics • University of Copenhagen

Grade: 11.7/12.0 (A)

Master's thesis: "Inner Model Theory - An Introduction", advised by Asger Törnquist.

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*September 2011—July 2014*

BSc in Mathematics • University of Copenhagen

Grade: 10.8/12.0 (B+)

Bachelor's thesis: "Gödel's Constructible Universe", advised by Asger Törnquist.

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## Volunteering

*April 2022—Present*

Vice Chair of the Board • Danish Data Science Community

The Danish Data Science Community is an official association (Danish: forening), which has three core purposes: (a) Strengthening the relations between all the data scientists in Denmark, (b) To establish a united voice on behalf of data scientists in Denmark, and (c) To strengthen the open-source culture within Danish data science.

*December 2019*

Data Study Group Facilitator • The Alan Turing Institute

Led a data science team of 14 PhD students for a week. We worked with WWF to see if news data could be utilised to monitor protected sites around the world, and our resulting model correctly detects 96% of the news articles that present a potential threat to a protected site, with only 18% false positives. Final report published at

<https://www.turing.ac.uk/research/publications/data-study-group-final-report-wwf> .

*December 2019*

Data Science Lead • Bristol Soup Run Trust

Starting from the Data & Community social hackathon in Bristol, I was in charge of a data science team that developed a machine learning model for a Bristol Soup Run Trust, a local charity that provides food and supplies to homeless people in Bristol who are in need. The model helps them predict how many people will show up on a given day, which both prevents a shortage of food as well as minimising food waste.

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## Publications

2023

ScandEval: A Benchmark for Scandinavian Natural Language Processing

• Submitted to NoDaLiDa '23

**Dan Saattrup Nielsen**

Ethical, political and epistemic implications of machine learning (mis)information classification: Insights from an interdisciplinary collaboration between social and data scientists • Journal of Responsible Innovation

Andrés Domínguez Hernández, Richard Owen, **Dan Saattrup Nielsen**, Ryan McConville

Monitoring Model Deterioration with Explainable Uncertainty Estimation via Non-parametric Bootstrap • AAAI '23

Carlos Mougán, **Dan Saattrup Nielsen**

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The Virtual Large Cardinal Hierarchy • Submitted to Fundamenta Mathematicae

**Dan Saattrup Nielsen**, Stamatis Dimopoulos, Victoria Gitman

2022

MuMiN: A Large-Scale Multilingual Multimodal Fact-Checked Misinformation Social Network Dataset • SIGIR '22 and GLB '22

**Dan Saattrup Nielsen**, Ryan McConville

2019

Games and Ramsey-like Cardinals • Journal of Symbolic Logic

**Dan Saattrup Nielsen**, Philip Welch

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## Grants

*March 2023*

Grand Solution • Danish Innovation Fund

**Conversational and Read-aloud Speech Dataset (CoRal)**. This project aims to build and open-source a Danish ASR dataset of +1000 hours along with ASR- and speech synthesis models. A key focus is to minimise bias through intelligent selection of speakers. DKK 22.5M awarded, DKK 5.5M of which the Alexandra Institute received. Work package lead pertaining to the model development.

*November 2017*

DTP fully funded studentship • Engineering and Physical Sciences Research Council (EPSRC)

Highly competitive Doctoral Training Partnership (DTP) studentship, covering my PhD studies at the University of Bristol for 3.5 years.

*April 2009*

Einer Wilslev's Scholarship • Einer Wilslev's Fund

A scholarship given to extraordinary students at the Niels Brock Business College. Received it all three consecutive years I attended the school, i.e., 2009-2011.

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