

Ulf Aslak

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Summary

PhD fellow at the Copenhagen Centre for Social Data Science, visiting researcher at the Technical University of Denmark and external lecturer at DIS Copenhagen. Holds a master's degree in Digital Media Engineering and a bachelor's degree in Physics from the Technical University of Denmark. Former Data Scientist at customer service review company Trustpilot. Completed master's thesis work at the Weizmann Institute of Science in Israel in collaboration with renowned physicist Uri Alon (+41k citations, 2 Ted Talks) investigating archetypes of personality in large questionnaire datasets. Won the inaugural Data Stories visualization contest hosted by Science Magazine in 2016 for inventing an interactive visualization method revealing the dynamics of social community patterns. Highly driven and inquisitive individual, passionate about challenges and novel learning experiences. Has a strong foundation in applied mathematics and physics, and advanced skills in non-linear signal processing methods including statistics and machine learning and is an expert Python programmer.

Education

- 2016–2019 **Ph.D.**, UNIVERSITY OF COPENHAGEN, Centre for Social Data Science (SODAS), Denmark.
(expected) Research in complex systems, deep learning and visualization. Focus on modeling tasks involving social data such as temporal community detection and location prediction. Advisors: Sune Lehmann, David Dreyer Lassen.
- Jan 2016 – **Research student**, WEIZMANN INSTITUTE OF SCIENCE, Uri Alon Lab, Israel.
Jun 2016 Worked under renowned physicist and computational biologist, Uri Alon, on the research component of my master's degree.
- 2014–2016 **M.Sc.Eng.**, TECHNICAL UNIVERSITY OF DENMARK, Digital Media Engineering.
Dissertation: *Personality Archetypes Support Evolutionarily Important Behavioral Strategies*. Advisors: Uri Alon, Sune Lehmann (mark: 12/A)
- Jul 2012 – **Exchange student**, NATIONAL UNIVERSITY OF SINGAPORE, Physics and Nanotechnology.
Dec 2012 Attended courses in Chinese, solid state physics, programming methodology and electrical engineering.
- 2010–2014 **B.Sc.Eng.**, TECHNICAL UNIVERSITY OF DENMARK, Physics and Nanotechnology.
Dissertation: *Computational Fluid Dynamics Simulations of Forward Osmosis Membrane Modules* (mark: 12/A)

Experience

- Jan 2018 – **Lecturer**, UNIVERSITY OF COPENHAGEN, Denmark.
present Responsibility for machine learning and complex network components of master's level course *Topics in Social Data Science* in spring semesters.
- Aug 2017 – **External lecturer**, DIS - STUDY ABROAD IN SCANDINAVIA, Copenhagen, Denmark.
present Full responsibility of bachelor's level course *Computational Analysis of Big Data* for US exchange students in spring and fall semesters. Received highest student rating among CS courses in 2017.
- 2015 **Intern/student assistant**, TRUSTPILOT, Copenhagen, Denmark.
Trustpilot is a platform for reading and sharing customer service reviews. Their customers (businesses) want positive reviews, and some cheat by purchasing fake reviews. As an intern, I developed a probabilistic model for fraud detection that I further maintained and developed as a student assistant.

- 2014–2015 **Animation Artist**, STERLITECH CORPORATION, Seattle, US/Web.
Sterlitech is a company that develops water filtration modules. Following the publication of my bachelor's thesis, where I modeled fluid flow in one of their modules, I produced a series of commercial instructional 3d animation videos for Sterlitech.
- 2013–2016 **Teaching assistant**, TECHNICAL UNIVERSITY OF DENMARK.
Courses: Physics 1 (4 times), Computational Tools for Big Data (2 times).
- 2013–2014 **Undergraduate researcher**, AQUAPORIN, Copenhagen, Denmark.
Aquaporin is a high-tech bio-physics company that produces specialized membranes for low-energy osmosis-driven water filtration. During the last year of my bachelor's degree I worked as a UG researcher at Aquaporin, and conducted research for my dissertation.

Publications

- 2017 **Constrained information flows in temporal networks reveal intermittent communities**, PHYSICAL REVIEW E (*under review*), Co-authors: M Rosvall, S Lehmann.
Optimal Allocation of Reviewers for Peer Feedback, EUROPEAN CONFERENCE ON E-LEARNING, Co-author: DK Wind, RM Jørgensen, SL Hansen, O Winther.
- 2016 **Quantifying Feedback: Insights Into Peer Assessment Data**, INTERNATIONAL CONFERENCE ON E-LEARNING, Co-author: DK Wind.
Open-source CFD model for optimization of forward osmosis and reverse osmosis membrane modules, SEPARATION AND PURIFICATION TECHNOLOGY, Co-authors: MF Gruber, C Hélix-Nielsen.

Conferences and workshops

- 2017 **Invited talk**, BARREL AI, Malmö, Sweden.
Title: *Neighborhood flow coupling: method for finding intermittent clusters of flow in multilayer networks*.
- Workshop talk**, UNIVERSITY OF COPENHAGEN, Denmark.
Workshop: *Experimenting with social data*. Talk title: *From JSON-packets to relationships*.
- Workshop talk**, UNIVERSITY OF TARTU, Estonia.
Workshop: *Workshop on data processing and analytics of smartphone and GPS data*. Talk title: *Computing high-level indicators of behaviour using smartphone data*.
- Conference talk**, UNIVERSITY OF CENTRAL FLORIDA, Orlando, US.
Conference: *International Conference on e-Learning*. Talk title: *Quantifying Feedback: Insights Into Peer Assessment Data*.
- Video/poster presentation**, DANISH ACAD. OF TECH. SCIENCES, Copenhagen, Denmark.
Presented the *Copenhagen Networks Study* to political, academic and industrial leaders at annual symposium.
- Invited discussant**, DATA POWER: ACTIVISM/APPROPRIATIONS/AESTHETICS, London, UK.
Lead discussant on data science and machine learning at workshop in the Centre for Digital Anthropology, University College London.
- Ignite talk**, NETSCI-X CONFERENCE, Tel Aviv, Israel.
Title: *Detecting communities in temporal networks*. Plenary session.
- 2016 **Conference attendance**, SIGGRAPH, Anaheim, California, USA.
Participated in workshops on GPU computing, big data engineering, and animation.
- 2014 **Poster presentation**, GREEN CHALLENGE, Lyngby, Denmark.
Title: *Module optimization protocol for testing forward osmosis membrane modules*.
- Poster presentation**, DWRIP, Copenhagen, Denmark.
Title: *Module optimization protocol for testing forward osmosis membrane modules*.

Awards and stipends

- 2017 **Best paper**, *International Conference on e-Learning*, UNIVERSITY OF CENTRAL FLORIDA.
- 2016 **Awarded 1st place**, *Data Stories data visualization competition*, SCIENCE MAGAZINE.
- 2014 **Finalist**, *Green Challenge environmental engineering competition*, TECHNICAL UNIVERSITY OF DENMARK.
- 2013-2017 **Travel stipends**.
The Oticon Foundation; Reinholdt W. Jorck and Wife's Foundation; The Danish Society of Engineers' Foundation; Berg-Nielsens Study and Support Foundation; Knud Højgaard's Foundation; Danish Tennis Foundation; Otto Mønsted's Foundation; Danish-Israeli Study Foundation and the Augustinus Foundation.

Skills

Background I have a background in physics engineering and have strong foundation in applied mathematics, statistical physics, information theory and probability theory. In maturing as a computational scientist I have developed a deep understanding of and ability to apply methods for modeling data. I am passionate about science communication through animation and data visualization, and am self-taught in using various creative tools.

Modus operandi I use **Python** as a means to perform scientific computing. I prefer to work with simple transparent tools such as **NumPy** and **SciPy** for data processing, and only use more advanced tools like **sklearn** to perform very high-level modeling tasks. For simple data visualization I use **matplotlib** and for advanced interactive visualizations I prefer to use the **D3** library in **JavaScript**, mainly because of its versatility. I often outsource my computations to remote servers using **Bash**, and occasionally use tools like **MapReduce** to do simple computations on very large datasets. I use **PyTorch** for building neural network models. I try to open source as much of my research code as possible using **Github**. I write papers using **LaTeX**. I design my illustrative figures using **Blender** and/or **Illustrator**. I work on a **Unix**-based machine.

Volunteer work

- 2016 – **Skateboarding instructor**, RESOURCE CENTRE OUTER NØRREBRO, Copenhagen, Denmark.
present Teaching skateboarding to vulnerable children of foreign ethnicity aged 9 to 17, every Wednesday.
- Apr 2015 **Member of the Board of Appeals**, TECHNICAL UNIVERSITY OF DENMARK.
Partaking in re-evaluation of exam projects in the course *Technology, economics, management and organization*.
- 2013–2014 **Pre-exam tutor**, TECHNICAL UNIVERSITY OF DENMARK.
Helping students understand key concepts in *Physics 1*, in the days leading up to their re-examination.
- 2010-2012 **Rhythmic dance instructor**, AFTENSKOLEN V/ LIS CRONBERG, Hillerød, Denmark.
Teaching rhythmic dance to disabled people of all ages.
- 2010 – **Writer/Editor**, WUNDERBAUM MAGAZINE, Copenhagen, Denmark.
present Periodically contributing to the online news stream at the Danish skateboarding magazine *Wunderbaum*, and writing pieces in the annually published paper edition.
- 2008–2010 **Music booker**, TOLDKAMMERET, Helsingør, Denmark.
Responsible for booking bands and arranging events at independent music venue.

Coursework

- 2016–2017 **Ph.D.**
Complex systems summer school, SANTA FE INSTITUTE, New Mexico, US
Bayesian Data Analysis, TECHNICAL UNIVERSITY OF DENMARK
IceLab Camp, UMEÅ UNIVERSITY, Umeå, Sweden

- 2014–2016 **M.Sc.Eng.**, TECHNICAL UNIVERSITY OF DENMARK.
 Non-Linear Signal Processing; Graph Theory; Applied Statistics and Statistical Software; Computational Tools for Data Science; Social data analysis and visualization; Personal Data Interaction; Introduction to Machine Learning and Data Mining; Social graphs and interactions; Data mining using Python; Technology, Economics, Management and Organisation
- 2010–2014 **B.Sc.Eng.**, TECHNICAL UNIVERSITY OF DENMARK.
 Electromagnetism for Physicist; Quantum Mechanics; Advanced Mathematics 2; Linear Control Design 1; Advanced Engineering Mathematics; Thermodynamics and Statistical Physics; Philosophy of science in engineering; Introduction to Biophysics; Fabrication of Micro- and Nano Structures; Electric Circuits 2; Optics and Photonics; Experimental Methods and Instrumentation in Physics; Planetary Physics; Visualisation of Micro- and Nano Structures; Experimental Micro- and Nanotechnology; General Chemistry; Mechanics and Physical Modelling

Languages

- Native **Danish (and Scandinavian languages), English**
- Intermediate **Spanish, German, Icelandic**
- Can order food in **Mandarin, Indonesian, Vietnamese, Hebrew**