



Pål Sundsøy

Senior quantitative analyst, PHD

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Pål Sundsøy is a Senior Quantitative Analyst in Investment Strategies at Norges Bank Investment Management (NBIM). NBIM is the investment arm of Norway's central bank that manages the world's largest sovereign wealth fund, with assets over \$1 trillion USD. He has published over 25 research publications and given over 30 international conference talks on Big Data for Social Sciences. He holds a Msc in Physics from Norwegian University of Science and Technology and a PhD in Data Science from University of Oslo.

Experience

NORGES BANK INVESTMENT MANAGEMENT

2016-

Senior Quantitative Analyst

Asset Strategies Group, Investment Strategies

- Developing predictive models for long/short equity investment strategies
- Management of large global systematic long/short equity portfolio
- Machine Learning, Factor Investment, Optimizing trade programs

TELENER RESEARCH

2007- 2016

Senior Data Scientist & Research Scientist

Big Data Analytics



- Working globally across South-East Asia, Europe and US
- Heading all research initiatives with MIT
- High-profile Data Science research together with MIT and Harvard

EUROPEAN SPACE AGENCY

2006- 2007

Head Engineer, Hinode Space Mission

- Developing search engine for Hinode Sun-observation Satellite
- International collaboration between NASA, ESA & JAXA.
- Data Centre based at Institute of Theoretical Astrophysics, Oslo



WORLD HEALTH ORGANIZATION

2006

Database developer & Analyst

Unit of Health Statistics and Evidence

- Developing databases related to global vital registration systems and statistical analysis



UNIVERSITE DE GENEVE

2005-2006

Research Scientist, Applied Quantum Physics Group

- Working in world leading research group of quantum communication
- Developing first prototypes of Quantum Cryptography



NORWEGIAN UNIVERSITY OF SCIENCE & TECHNOLOGY

2004- 2005

- Database programmer, Institute of Biotechnology (2004-2005)
- Teaching Assistant, Quantum Physics / Atomic Physics, Institute of Physics (2004)



Education

- **Ph.D Data Science**
University of Oslo, Norway (2017)
- **MSc Physics**
Norwegian University of Science and Technology, Norway (1999-2004)
- Exchange student
Quantum Mechanics, Math Modelling
UNSW, Australia, 2003
- Bjerkely County School
One year directed C++ study
Norway, 1999-2000
- Oxford Fintech Programme
2017-2018

Achievements

- 25+ peer-reviewed research publications in applied data science
- 30+ international conference talks
- Research cited in 50+ high-profile media outlets, incl. MIT Technology Review, Wall Street Journal, Huffington Post, Science News, Harvard Magazine, Big Data Report to President Obama and more.
- Program committee member of 10+ international Machine Learning & Data Science conferences

References

- E.Jahani (MIT)
- Y.A.Montjoye (MIT, Imperial College)
- J.Bjelland (Telenor Group)
- T. Couronne (Telenor Group)
- S.V. Haugan (Astrophysics, UIO)

Scientific Program Committees

- **NetMob** Leading conference on scientific analysis of large mobile phone datasets
2013, Massachusetts Institute of Technology (MIT)
2015, Massachusetts Institute of Technology (MIT)
2017, Vodafone Theatre, Italy
- **Social Informatics** International conference on Social Informatics
2018, Higher School of Economics, Saint Petersburg, Russia
2017, University of Oxford, UK
- **ECML-PKDD** European Conference on Machine Learning & Knowledge Discovery
2018, Dublin, Ireland
- **Netsci** The flagship conference on interdisciplinary network science research
2017, Indiana University, US
- **Complex Networks** International conference on Complex networks and applications
2018, University of Cambridge, UK
2017, Lyon, France
- **CARMA** International Conference on Advanced Research Methods and Analytics
2016, Valencia, Spain
- **KDD** Knowledge Discovery & Data Mining
2014, New York
- **ICDM** International Conference on Data Mining
2014, China
- **IC2S2** International conference on Computational Social Sciences
2018, Northwestern University, US
- **ICCS** International conference on computational science
2018, Wuxi, China

Advisory Boards

- **Vendu.ai** A Norwegian proptech startup on a mission to simplify handling of real-estate. Vendu utilizes multiple data sets (structured and unstructured) and state-of-the-art Deep Learning technology (Machine Learning & AI). 2018-



Publications
Talks
Media Exposure

Selected scientific publications

2017



Towards real-time prediction of unemployment and profession

Joint work with MIT Media Lab and MIT Sloan.
Published in Social Informatics, LNCS, Springer.



Improving official statistics in emerging markets using machine learning and mobile phone data

Joint work with MIT Media Lab
Published in EPJ Data Science.



Mapping Poverty using mobile phone and satellite data

Joint work with MIT Media Lab and Flowminder
Published in Royal Society Interface.



Differential Network Effects on Economic Outcomes: A Structural Perspective

Joint work with MIT Media Lab and MIT Sloan.
Published in Social Informatics, LNCS, Springer.



Modeling the Temporal Nature of Human Behavior for Demographics Prediction

Joint work with MIT Media Lab
Published in European Conference on Machine Learning (ECML-PKDD)



Mitigating the risks of financial exclusion: Predicting illiteracy with standard mobile phone logs

Published in International Conference on Behavioral Modeling and Prediction (SBP-BRIMS) , Springer.



Product diffusion through on-demand information-seeking behaviour

Joint work with Harvard and Northeastern University
Published in Royal Society Interface

2016



Deep learning applied to mobile phone data for Individual income classification

Joint work with MIT Media Lab
Published in International conference on Artificial Intelligence (ICAITA 2016)



Detecting climate adaptation with mobile network data:

Anomalies in communication, mobility and consumption patterns during Cyclone Mahasen

Joint work with Flowminder
Published in Climatic Change



Unveiling Hidden Migration and Mobility Patterns in Climate Stressed Regions: A Longitudinal Study of Six Million Anonymous Mobile Phone Users in Bangladesh

Joint work with Flowminder
Published in Global Environmental Change 38 (2016): 1-7

2015



Impact of human mobility on the emergence of dengue epidemics in Pakistan

Joint work with Harvard University
Published in PNAS (2015)

2014



Big Data-Driven Marketing: How Machine Learning outperforms marketers' gut-feeling

Joint work with MIT Media Lab
Published in Social Computing, Behavioral-Cultural Modeling, & Prediction, Washington, USA (2014), LNCS Vol. 8393 (Springer)



Handset-centric view of smartphone application use

Joint work with Cambridge University
Published in Procedia Computer Science



Small circles: Mobile Telephony and the cultivation of the private

Published in The Information Society

2013



Comparing and visualizing the social spreading of products on a large-scale social network

Published in The influence on Technology on Social Network Analysis and Mining, Springer

2012



The activation of core social networks in the wake of the 22 July Oslo bombing

Published in IEEE Advances in Social Network Analysis and Mining



Small and Even Smaller Circles: The Size of Mobile Phone-Based Core Social Networks in Scandinavia and South Asia

Published in Journal of Intercultural Communication Research



The socio-demographics of texting: An analysis of traffic data

Published in New Media & Society



A Social Network Study of Android VS Apple Smartphone battle

Published in IEEE Business Applications of Social Network Analysis

2010



Product adoption networks and their growth in a large mobile phone network

Published in IEEE Advances in Social Network analysis and Mining, 208-216, 2010

Media Exposure

-  Mobile phone and satellite data to map poverty, **Science Daily, Feb 2017**
-  Poverty mapped in near real-time using mobile phone and satellite data, **Seeker, Feb 2017**
-  How metadata can reveal what your job is, **Vice Media, Dec 2016**
-  Researcher uses mobile phone data to predict illiteracy, **Engadget, July 2016**
-  Mobile phone data reveals literacy rates in developing countries, **MIT Technology Review, July 2016**
-  Report to President Obama: Big Data and Privacy, **White House, May 2014**
-  How Big Data can serve development, **Gates Foundation, 2014**
-  May 17th in 25 seconds, **Dagens Næringsliv, May 2014**
-  Will Big Data end the Executive Gut Feeling, **Telenor Group, Feb 2013**
-  Bringing together the brightest minds in Big Data, **Telenor Group, may 2013**
-  Big Data - Good for the World, good for Business, **VG Nett, E24 news, may 2013**
-  Big Data – 90% of all data has been generated the two last years, **IT News, Feb 2013**
-  Cell phone data analysis dials in crime networks, **Science News, Mar 2013**
-  How Big Cities Can Lead to Small Thoughts, **Wall Street Journal, Mar 2012**
-  How friends influence gadget adoption, **MIT Technology Review, Jun 2011**
-  Apple product fever, **Science News, Jun 2011**
-  Telenor researchers reveal how iPad spreads, **Telenor Group, May 2011**
-  Big Data Analytics in Telenor Group, **Article in Norwegian Marketing Association**
-  How friends influence gadget adoption, **Times of India, Jun 2011**
-  Wireless companies could use your friends, **MIT Technology Review, Jul 2010**
-  A Vital New Marketing Metric: The Network Value of a Customer, **Predictive-marketing.com, Sept 2010**

Talks

Scientific conferences

2017

Differential Network Effects on Economic Outcomes: A Structural Perspective

Joint work with MIT Media Lab and MIT Sloan.
Social Informatics, Oxford University, 2017

Towards real-time prediction of unemployment and profession

Joint work with MIT Media Lab and MIT Sloan.
Social Informatics, Oxford University, 2017

Mitigating the risks of financial exclusion : Predicting illiteracy with standard mobile phone logs

Social Computing, Behavioral-Cultural Modeling and Prediction, Washington, USA, 2017

Mapping poverty using mobile phone and satellite data

Joint work with MIT Media lab and Flowminder
Netmob, Milan, Italy, 2017

Making Money: Evidence from Individually Matched network, education and income data

Joint work with MIT Media lab and MIT Sloan
International conference on computational social science, Cologne, Germany, 2017

Modeling the Temporal Nature of Human Behavior for Demographics Prediction

Joint work with MIT Media Lab
ECML-PKDD 2017

2016

Deep Learning Applied to Mobile Phone Data for individual Income classification

Joint work with MIT Media lab
International Conference of Artificial Intelligence, Bangkok, 2016

2015

Using Mobile Phone Data for Poverty Estimates in Bangladesh

Invited Speaker
United Nations Big Data for Official Statistics, Abu Dhabi, 2015

Predicting Gender from Mobile Phone Metadata

Joint work with MIT Media lab
Netmob, Massachusetts Institute of Technology (MIT), Boston, US, 2015

Investigating Social Influence through large-scale field experimentation

Joint work with Northeastern University
Netmob, Massachusetts Institute of Technology (MIT), Boston, US, 2015

Dynamics of Social and Spatial Segregation using mobile phone data

Netmob, Massachusetts Institute of Technology (MIT), Boston, US, 2015

A cross country study of gender prediction using mobile phone metadata

Joint work with MIT Media lab
NetSci-X, Rio De Janeiro, Brasil, 2015

Smartphone application co-usage: Could we predict your next app?

Joint work with Cambridge University
NetSci-X, Rio De Janeiro, Brasil, 2015

Social Influence and Complex Contagion

Joint work with Northeastern University
Workshop on information in Networks, Stern School of Business, New York, US, 2015

2014

Big Data And Social change in Underdeveloped Countries
Rockefeller Centre, Bellagio, Italy (2014)

Big Data-Driven Marketing: How Machine Learning outperforms marketers gut-feeling
Joint work with MIT Media Lab
Social Computing, Behavioral-Cultural Modeling and Prediction, Washington, USA, 2014

2013

Accelerating Internet Growth in Asia using Viral Spreading
Joint work with Northeastern University
Netmob, Massachusetts Institute of Technology (MIT), Boston, US, 2013

Big Data: Rewards and Risks for the Social Sciences
Oxford Internet Institute, University of Oxford, UK, 2013

Testing contagion in small groups via Direct Marketing
Joint work with Northeastern University
Stern School of Business, New York, US, 2013

Apple VS Android: Signals of success in the Social Network
ECCS 2013 International conference on Complex Systems , Quantifying Success satellite session
World Trade Center, Barcelona, Spain, 2013

Clustering of Smartphone ownership in Development Countries
Netmob, Massachusetts Institute of Technology (MIT), Boston, US, 2013

2012

Apple VS Android: A comparison of Social Effects in Adoption
Netmob, Massachusetts Institute of Technology (MIT), Boston, US, 2012

The activation of social networks in the wake of the Oslo 22 July Bombing
INSNA Social Network Analysis Conference
Sunbelt XXXII, Redondo, California, US, 2012

2011

Comparing and visualizing the social spreading of products on a large-scale social Network
WIDS, Massachusetts Institute of Technology (MIT), Boston, US, 2011

2010

Social Network Monsters in Telecom Call Graphs
INSNA Social Network Analysis Conference
Sunbelt XXX, Riva Del Garda, Italy, 2010

Telecom Service Diffusion and Influence in a network of interlocking directorates
INSNA Social Network Analysis Conference
Sunbelt XXX, Riva del Garda, Italy, 2010

Product Adoption, Network Structure and Growth in a Large Mobile Phone Network
ASONAM 2010, Advances in Social Network Mining and Analysis, Odense, Denmark (2010)

2009

Product Spreading and Network Structure for an inter firm communication network
INSNA Social Network Analysis Conference, Sunbelt XXIX, San Diego, US, 2009

Talks

Industrial conferences

Big Data Science from a telecom perspective
2015 The Decision Support Day, Oslo, Norway

Data Science on large mobile phone datasets
2015 Santander Digital Week, Oslo, Norway

Data science
2015 Innovation Day, Affecto, Oslo, Norway

Big Data and Predictive Analytics (international keynote)
2013 Big Data Europe, Zurich, Switzerland

Improving Business With Data Science
2014 Gurus of Business Intelligence, Oslo Spektrum, Norway

Big Data - how far can we go?
2013 New Media Network, Oslo, Norway

13 times better hitrate with Machine Learning
2013 IT-Tinget, Tønsberg, Norway

Using Big Enough Data to Give the Customers what they want
2013 Telenor Group, Oslo, Norway

Big Data in Telecom: Making an impact on peoples lives
2013 Arrangement with UN Global Pulse, NorthEastern University (200 ppl), Oslo, Norway

Insights and applications of customer data: Focus on Advanced Analytics
2011 Information Management, Oslo, Norway, Norway

Advanced Analytics in Telecom
2012 Information Management, Copenhagen, Denmark