



# 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 \$950 billion 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- Present

#### Senior Quantitative Analyst, Asset Strategies Group, Investment Strategies

- Global Equities Portfolio management
- Development of long and short-term investment strategies based on quantitative signals

### TELENOR GROUP RESEARCH 2007- 2016

#### Senior Data Scientist & Project Manager, 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

#### Researcher, Applied Physics, Quantum Cryptography

- World leading research group in 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

## Achievements

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

## 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** – interdisciplinary conference in computational social sciences  
2017, University of Oxford



**Netsci** – the flagship conference on interdisciplinary network science research  
2017, Indiana University, US



**Complex Networks**  
2017, 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



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.

## 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