

## Curriculum Vitae JENSSEN, ROBERT

Department of Physics and Technology (DoPT)  
UiT – The Arctic University of Norway

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DOB: 19<sup>th</sup> Oct. 1974

Norwegian citizen

*Collaborator in project*



**Research group:** UiT Machine Learning Group: <http://site.uit.no/ml>

### Positions

08/2009-present Associate Professor, DoPT, UiT  
05/2015-present Adjunct Prof, Norwegian Computing Center (NR), Oslo  
10/2012-01/2017 Adjunct Prof, Norwegian Center for E-Health Research (NSE),  
University Hospital of North Norway

### UiT Leadership

07/2016-present Head, UiT Machine Learning Group  
08/2013-2016 Head, Electrical Engineering Group  
08/2013-present DoPT Board Member (special responsibility for outreach and dissemination)

### Research Interests

Jenssen's research interests are on advancing deep learning (e.g. Scientific Reports 2017, IGARSS 2017, CVPR 2016), kernel machines (receiving several int'l best paper awards), and their combination. Long-term activity on mining electronic health records with a special focus on prediction/prevention of postoperative complications, and analysis of remote sensing imagery. Applied and industrial research on smart grid and power line inspections (deep learning), credit risk analysis (with Santander bank), and PET (with UiT's new PET center). Jenssen's group is funded over NFR (Norwegian Research Council), FRIPRO, IKTPLUSS, ROMFORSK, NÆRINGSPHD, and by industry. Close collaboration with the Norwegian Computing Center, the Norwegian Center on E-Health Research, University Hospital of North Norway, and with international groups. Jenssen has published ~80 peer reviewed papers, over 20 in 2015-2017 alone (1140 citations, h-index 17 [Google scholar]).

### Scientific Honors

1. Invited Keynote Speaker: Health Data Analysis Conference (Tekna/Norway), 2017.
2. Invited Keynote Speaker: NORBIS 2017 Conference.
3. Invited Keynote Speaker: Geilo Winter School on eScience 2017.
4. Invited Keynote Speaker: ICPR 2016 (Int'l conf. on pattern recognition) Workshop on Pattern Recognition for Healthcare Analytics (<https://sites.google.com/site/iwprha3>)
5. Invited Keynote Speaker: Scandinavian Conf. on Image Analysis, Copenhagen, June 2015.
6. Host supervisor for C. Soguero-Ruiz, winner of the Orange Foundation Best PhD Thesis Award by the Spanish Official College of Telecommunications Engineers.
7. Google DeepMind, Memorial Sloan Kettering Cancer Center and the NSF travel award for K. Mikalsen, NIPS 2015, "Predicting postoperative delirium using anchors" (supervisor).
8. NVIDIA GPU sponsorship for UiT Machine Learning Group, 2016 and 2017.
9. IBM travel award for C. Soguero-Ruiz, ICPR 2014, "Feature selection using Kernel Component Analysis for Early Detection of Anastomosis Leakage" (supervisor).
10. Winner of the IEEE GRS Society Letters Prize Paper Award 2013 for the paper "Kernel Entropy Component Analysis in Remote Sensing Image Clustering".
11. Editor's Choice Paper of the IEEE GRS Letters, March 2012.
12. Featured Paper "Kernel Entropy Component Analysis" of the IEEE Transactions on Pattern Analysis and Machine Intelligence, May 2010.

13. Received the 2007 University of Tromsø Young Investigator Award (a bi-annual award).
14. Received the 2005 ICASSP Outstanding Paper Award for the paper “The Laplacian Spectral Classifier”.
15. Received Honorable Mention for the 2003 Pattern Recognition Journal Best Paper Award for the paper “Independent Component Analysis for Texture Segmentation.”

### **Previous Positions and Visits:**

- Guest Prof., Technical University of Denmark (2012-2013, 1 year)
- Personal postdoc funded over FRIPRO/Norwegian Research Council (2006-2009)
- Guest researcher, Technical University of Berlin (2008-2009, 1 year)
- Guest researcher, University of Florida (2002-2003, 2004, 1.5 years)
- Guest researcher, University of Aberdeen (2005, 3 months)
- Associate Professor. DoPT, UiT (temporary position 2005-2006)
- Numerous weeklong visits U Valencia, U Rey Juan Carlos, UCL, U Glasgow

### **Education**

05/2001-05/2005      Dr. Scient (PhD) disputation date: 09.05 2005, UiT (Machine Learning)  
 08/1996-12/2000      Master of Science (MSc), Applied Physics

### **Editorial Board, Scientific Committees and Associations**

- Associate Editor of the journal *Pattern Recognition* (2010-)
- IEEE Signal Processing Society MLSP Technical Committee Member (int’l leadership in machine learning, organization of IEEE MLSP conference, and ICASSP sessions).
- IAPR (Int’l Association for Pattern Recognition) Governing Board Member
- Steering committee “Re-Learn” Belgian research council
- President, Norwegian IAPR society (NOBIM/nobim.no)

### **PhD Opponent**

- Opponent for Ali Bahrami Rad, “ECG-based Resuscitation,” University of Stavanger, 2017.
- Opponent for Hilda Deborah, “Towards Spectral Mathematical Morphology,” NTNU, 2016.
- Opponent for Huyen Vu, “Respiratory-Cardio Signal Processing and Analysis of Resuscitation Data on Newborns in Low-Resource Settings,” University of Stavanger, 2016.
- Opponent for: Knut Landmark, “Machine Learning and Image Analysis for Acoustic Seabed Classification,” University of Oslo, 2016.
- Opponent for: Cristina Soguero-Ruiz, “Machine Learning and Knowledge Management for Decision Support: Applications in Promotional Efficiency and Healthcare,” U Rey Juan Carlos, 2015.
- Opponent for: Margarita Sanromán Junquera, “Advanced Intracardiac Electrogram Analysis for Arrhythmia Ablation Support,” U Rey Juan Carlos, Spain, 2014.
- Opponent for: Nicolas Chrysanthos, “Kernel Methods for Flight Data Monitoring,” Troyes University of Technology, France, 2014.
- Opponent for: Jacob Vestergaard, “Interpretation of Images from Intensity, Texture and Geometry,” Technical University of Denmark, 2014.
- Thesis evaluator for: Rebeca Goya Esteban, “Signal Processing and Nonparametric Statistics for ECG Long-Term Monitoring: Application to Heart Rate Variability, Atrial Fibrillation and T-Wave Alternans,” U Rey Juan Carlos, Spain, 2014.
- Thesis evaluator for: Óscar Barquero Pérez, “Robust Signal Processing in Cardiac Signals -- Applications in Heart Rate Variability, Heart Rate Turbulence and Fibrillatory

Arrhythmias,” U Rey Juans Carlos, Spain, 2014.

Numerous PhD committees at UiT.

### **Major Collaboration** (joint papers and proposals)

Fred Godtlielsen, UiT; J. Principe, U Florida; D. Erdogmus, Northeastern U; M. Girolami, U Warwick; L. K. Hansen, Technical U Denmark; G. Camps-Valls, U Valencia; C. Soguero-Ruiz and J. L. Rojo-Alvarez, U Rey Juan Carlos; K.-R. Muller, Tech U Berlin; C. Alippi, Politecnico di Milano; Lorenzo Livi, U Exeter; Norwegian Computing Center, Oslo (Salberg, Eikvil); Norwegian Center on E-Health Research (Skrøvseth); University Hospital of North Norway (Revhaug, Lindsetmo). The research extends from FRIPRO funded basic research, to industrially funded research.

### **Industrial Relevance**

Santander Bank sponsors one PhD in Jenssen’s group (Rogelio M. Andrade), and the company eSmart systems sponsors another (Nhan Nguyen). Jenssen’s work (kernel entropy component analysis) has led to patent for flight monitoring by the company SAGEM in France. Jenssen’s work on Electronic Health Records has led to DOFI (Disclosure of Invention/Idea).

**Supervision:** Filippo Bianchi (NFR postdoc), Jonas N. Myhre (postdoc, finished PhD with Jenssen as supervisor Oct 2016), Karl Øyvind Mikalsen, Sigurd Løkse, Michael Kampffmeyer (NFR), Nhan Nguyen (NFR), Rogelio Andrade (NFR), Luigi Luppino (NFR), Samuel Kuttner, Miguel Gonzales (all PhD students) + 6 Master students. Jenssen has supervised 17 master students to completion and has co-supervised several visiting PhD students to completion.

### **Foreign Guests in UiT Machine Learning Group (for longer stays)**

Visiting Profs: Lorenzo Livi, U Exeter (Nov & Aug 2016); Raul Santos-Rodriguez, U Bristol (Nov 2016, Aug 2015); Inma Mora-Jimenez, U Rey Juan Carlos (Apr-Jun 2015). Visiting PhD students: E. Izquierdo-Verdiguier (U Valencia, Jun-Aug 2012); C. Soguero-Ruiz (U Rey Juan Carlos, 4 months 2013, 3 months in 2014, 3 months in 2015); M. Kloft (TU Berlin, Aug 2009). Aleksey Tyulpin (MSc student Northern Federal University, Arkhangelsk, 1 month 2014). Numerous shorter visits by top professors (e.g. Klaus-R. Muller, Jose Principe, Gustau Camps-Valls, Jose L. Rojo-Alvarez, Mark Girolami, etc.).

### **Major Grants as PI and co-PI (PI unless otherwise stated)**

**Norwegian Research Council (NFR)** 1) grant no. 239844 over FRIPRO (“Next Generation Kernel Machines” 2015-2018); 2) grant no. 171125 over FRIPRO (“Intelligent Data Analysis” 2006-2009); 3) grant no. 251327 over ROMFORSK (“Change detection in heterogeneous remote sensing” 2016-2018 co-PI). 4) grant no. 260205 over NÆRINGSPHD w/Santander bank (“Machine Learning for Credit Risk Modeling” 2016-2018); 5) grant no. 263894 over NÆRINGSPHD (“Image and Sensor Data Analysis for RPAS-based Smart Electricity Grid Inspections” 2016-2018) with eSmart Systems; 6) grant no. 270738 over IKTPLUSS (2017); **UiT grants:** 7) 1 PhD (“Semi-supervised learning” 2012-2016); 8) 1 PhD (“Machine learning for medical text mining” 2013-2017); 9) 1 PhD (“Next Generation Machine Learning”); 10) 1 PhD PET data analysis (2017-2021). **Helse-Nord:** 11) 1 postdoc and 1 researcher (“Mining Electronic Health Records,” co-PI); 12) 1 postdoc (“Automatic Machine Learning and User Modelling of Intramural Communication in Complex and Time-Critical Organizations”, 2015-2018 co-PI); 13) 1 PhD (“Ubiquitous and Self-Learning Intramural Communication System for Hospitals,” co-PI).

## Organization of Scientific Meetings, Professional Activities

- General Chair of the Scandinavian Conf. on Image Analysis, Tromsø, 2017: [scia2017.org](http://scia2017.org)
- General Chair of NOBIM 2010; organizing committee of NOBIM 2012, 2014.
- Program Chair, Scandinavian Conf. on Image Analysis, Oslo, 2009
- Chair of numerous oral and poster sessions at int'l conferences such as e.g. ICASSP'17
- Program committee member of numerous conf: ICPR, ICML, MLSP, ICPRAM, etc.

**Teaching:** Fys-3012 Pattern recognition; Fys-2007 Statistical signal theory; Fys-2006 Signal processing; Fys-3011 Detection theory; Fys-2010 Digital image processing (one or two course per semester as responsible since fall 2006). PhD courses (reading groups for 10 credits): Bayesian onparametrics (2016); Deep learning (2015); Random forests (2015); Gaussian processes (2014).

## Track Record

- ~80 peer reviewed papers, over 20 submitted/published in 2015-2017 alone, h-index 17, 1140 citations [Google Scholar May 2017].
- Several international research awards distributed over 2003-present (see *Scientific Honors*)
- Invited Keynote speaker ICPR, Workshop on Healthcare Analytics, Mexico Dec 2016.
- Invited Keynote Speaker Int'l Conf "Scandinavian Conference on Image Analysis" 2015.
- Invited Keynote Speaker Geilo Winter School on eScience, 2017
- Invited Keynote Speaker NORBIS 2017
- Invited Keynote Speaker Health Data Analysis (Tekna/Norway) 2017

For paper selection, see below. Selection focused towards recent journal papers in order to illustrate breadth and current research focus. Many papers with more citations from around 2006-2010 not included, only a selection. Citations included where relevant.

1. F. Bianchi, L. Livi, C. Alippi, R. Jenssen (2017), "Multiplex Visibility Graphs to Investigate Recurrent Neural Network Dynamics," *Scientific Reports* (a Nature publication).
2. C. Soguero-Ruiz, K. Hindberg, I. Mora-Jimenez, J. L. Rojo-Alvarez, S. O. Skrøvseth, F. Godtliebsen, K. Mortensen, A. Revhaug, R.-O. Lindsetmo, K. M. Augestad and R. Jenssen (2016), "Predicting Colorectal Surgical Complications using Heterogeneous Clinical Data and Kernel Methods," *Journal of Biomedical Informatics*, 61, 87-96. Citations: 5 [3 self]
3. E. Izquierdo-Verdiguier, R. Jenssen, L. Gomez-Chova and G. Camps-Valls (2015), "Spectral Clustering with the Probabilistic Cluster Kernel," *Neurocomputing*, 149, 1299-1304. Citations: 10 [1 self]
4. C. Soguero-Ruiz, K. Hindberg, J. L. Rojo-Alvarez, S. O. Skrøvseth, F. Godtliebsen, K. Mortensen, A. Revhaug, R.-O. Lindsetmo, K. M. Augestad and R. Jenssen (2014), "Support Vector Feature Selection for Early Detection of Anastomosis Leakage from Bag-of-Words in Electronic Health Records," *IEEE Journal of Biomedical and Health Informatics* (doi: 10.1109/JBHI.2014.2361688). Citations: 7 [2 self]
5. V. Vikjord and R. Jenssen (2014), "Information Theoretic Clustering using a k-Nearest Neighbors Approach," *Pattern Recognition*, 47(9), 3070-3081. Citations: 13 [2 self]
6. R. Jenssen (2013), "Entropy-Relevant Dimensions in Kernel Feature Space," *IEEE Signal Processing Magazine*, 30(4), pp. 30-39. Citations: 13 [4 self]
7. R. Jenssen (2013), "Mean Vector Component Analysis for Visualization and Clustering of Non-Negative Data", *IEEE Transactions on Neural Networks and Learning Systems*, 24(10), pp. 1553-1564. Citations: 10 [1 self]

Older

8. R. Jenssen (2010), "Kernel Entropy Component Analysis," *IEEE Trans Pattern Analysis and Machine Intelligence*, 32(5), 847-860. Citations: 180 [17 self]
9. U. Ozertem, D. Erdogmus, R. Jenssen (2008), "Mean Shift Spectral Clustering," *Pattern Recognition*, 41(6), 1924-1938. Citations: 52 [2 self]
10. R. Jenssen, J. Principe, D. Erdogmus, T. Eltoft (2006), "The Cauchy-Schwarz Divergence and Parzen Windowing: Connections to Graph Theory and Mercer Kernels," *Journal of the Franklin Institute*, 343(6), 614-629. Citations: 61 [1 self]