

Alexander Lundervold

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Personal Data

Born: July 27, 1983 in Oslo, Norway
Citizenship: Norwegian

Employment

Associate Professor, Western Norway University of Applied Sciences, Norway, 2014–present
Postdoctoral researcher (Marie Curie fellow), Inria Bordeaux, France, 2013–2014
Temporary associate professor, Norwegian University of Science and Technology, 2011–2013
Doctoral research fellow, University of Bergen, 2007–2010
Teaching assistant, University of Bergen, 2003–2007

Education

PhD, Numerical analysis, University of Bergen, 2011. Thesis advisors: Hans Z. Munthe-Kaas (Bergen), Kurusch Ebrahimi-Fard (ICMAT, Spain). Evaluation committee: Martin Bordemann (LMIA, France), Ander Murua (EHU, Spain). Thesis title: *Lie-Butcher series and geometric numerical integration on manifolds*

MSc., Topology, University of Bergen, 2007. Thesis advisor: Bjørn I. Dundas. Thesis title: *Higher order cyclic homology for rational algebras*

BSc. Mathematics, University of Bergen, 2005

Publications

A. Lundervold, E. A. Valestrand, A. Lundervold, T. Hausken. *Predicting irritable bowel syndrome (IBS) from brain MR imaging data using machine learning*, Poster at the 2017 Geilo Winter School in eScience, 2017

A. Lundervold and O.D. Røksund. *Imaging-based modeling of the human larynx for simulation of airflow during exercise*. Abstract, poster and presentation at MedViz 2016

K. L. Cornec, O. Verdier, A. Lundervold, V. Barra, and A. Lundervold. *Python-based software for medical imaging and machine learning - an example from brain imaging in IBS*, Abstract and poster at MedViz 2016

C. B. Rygh, H. Gundersen and A. Lundervold. *Healthy body, healthy mind: Multi-parametric evaluation of muscle function, performance and cognitive function can images and biomarkers tell us what we need to know?*, Abstract and poster at MedViz 2016

K. Ebrahimi-Fard, A. Lundervold, I. Mencattini, H.Z. Munthe-Kaas. *Post-Lie algebras and isospectral flows*, Symmetry, Integrability and Geometry: Methods and Applications (SIGMA), Volume 11, Issue 093, 2015

A. Lundervold, K. Ebrahimi-Fard and H.Z. Munthe-Kaas. *On the Lie enveloping algebra of a post-Lie algebra*, Journal of Lie Theory, Volume 25, Issue 4, 2015

A. Lundervold and H.Z. Munthe-Kaas. *On algebraic structures of numerical integration on vector spaces and manifolds*, IRMA Lectures in Mathematics and Theoretical Physics, Volume 21, 2015

K. Ebrahimi-Fard, A. Lundervold and D. Manchon. *Noncommutative Bell polynomials, quasideterminants and incidence Hopf algebras*, International Journal of Algebra and Computation, Volume 24, Issue 5, 2014

H.Z. Munthe-Kaas and A. Lundervold. *On post-Lie algebras, Lie-Butcher series and moving frames*, Foundations of Computational Mathematics, Volume 13, Issue 4, 2013

A. Lundervold and H.Z. Munthe-Kaas. *Backward error analysis and the substitution law for Lie group integrators*, Foundations of Computational Mathematics, Volume 13, Issue 2, 2013

K. Ebrahimi-Fard, A. Lundervold, S.J.A. Malham, H.Z. Munthe-Kaas, A. Wiese. *Algebraic structure of stochastic expansions and universally accurate simulation*, Proceedings of the Royal Society. Mathematical, Physical and Engineering Sciences, Volume 468 (2144), 2012

A. Lundervold and H.Z. Munthe-Kaas. *Hopf algebras of formal diffeomorphisms and numerical integration on manifolds*, Contemporary Mathematics, 539, 2011

A. Lundervold, A. Lundervold, H. Nordby, A.J. Lundervold, I. Reinvang. *Application of nonlinear time series analysis to single-trial ERPs*, Human Brain Mapping Conference, June 18–22, 2003, New York City.

Personal grants

ERCIM Alain Bensoussan Fellowship (Marie Curie Fellow), 2013

Abel Extraordinary Chair from the NILS Mobility Project, 2009

Abelstipend from the Norwegian Mathematical Society, 2005

Carl Johan Storetvedts legat (awarded to talented students at the University of Bergen), 2004

Current projects

Computational medicine: Numerical models for medical images and signals.

<http://computationalmedicine.no>.

Structural and functional brain connectivity based on multimodal brain MRI recordings. A collaboration with the Dept. of Biomedicine, UiB

Development and evaluation of image-based biomarkers. A collaborative project with the Faculty of Health and Social Sciences, HiB

Idrett, helse, funksjon (Athletics, health, function). <http://www.hib.no/forskning/forskergrupper/idrett-helse-og-funksjon/>. An interdisciplinary project at HiB.

Simulation and modelling of the larynx. HVL, Haukeland University Hospital and NMBU

Healthy body, healthy mind: Multiparametrisk evaluering av muskelfunksjon, fysisk prestasjon og kognitiv funksjon – hva kan bilder og biomarkører fortelle oss?. A collaboration with the Faculty of Health and Social Sciences, HiB

Founder and main developer of *AkademiX*: <https://akademix.no>. An e-learning platform based on Open edX.

Teaching Experience

Lecturer, HVL. MAT106 – Advanced mathematics for electrical engineers, 2017

Lecturer, HiB. MAT100 – Basic mathematics for electrical engineers, 2016

Lecturer, UiB. BMED360 – In Vivo Imaging and Physiological Modelling, 2016

Lecturer, HiB. MAT106 – Advanced mathematics for electrical engineers, 2016

Lecturer, HiB. MAT100 – Basic mathematics for engineers, 2015

Supervisor of the bachelor project *Tryg Maintenance App - A cross-platform application using Titanium, Alloy and Appcelerator Cloud Service* at the Dept. of Mathematics, Computation and Physics, HiB, 2015. (The project was awarded the 2016 “Best bachelor project” by the department)

Lecturer, HiB. MAT106 – Advanced mathematics for electrical engineers, 2015

Lecturer, HiB. MAT100 – Basic mathematics for engineers, 2014

Lecturer, NTNU. TMA4125 – Matematikk 4, 2013

Lecturer, NTNU. TMA4100 – Matematikk 1, 2012

Lecturer, NTNU. MA0002 - Brukerkurs B, 2012

Lecturer, NTNU. TMA4100 – Matematikk 1, 2011

Substitute lecturer in two lectures, UoB. MAT212 – Functions of several variables, 2010

Substitute lecturer in two lectures, Université de Strasbourg, France. Course: *Les algèbres de Hopf combinatoires en théorie quantique des champs perturbative*, 2009

Substitute lecturer in two lectures, UoB, MAT235 – Vector and tensor analysis, 2008

Teaching assistant, UoB. STAT101 – Elementary Statistics, 2007

Teaching assistant, UoB. MAT121 – Linear Algebra, 2007

Teaching assistant, UoB. MAT111 – Calculus I, 2006

Teaching assistant, UoB. MAT121 – Linear Algebra, 2006

Teaching assistant, UoB. MAT111 – Calculus I, 2005

Teaching assistant, UoB. MAT213 – Functions of a Complex Variable, 2005

Teaching assistant, UoB. MAT112 – Calculus II, 2004

Teaching assistant, UoB. MAT111 – Calculus I, 2003

Administrative Experience

Secondary proposer on the COST action proposal *Functional MR imaging for renal parenchymal disease*, OC-2016, 2016

Member of the organizing committee of the *10th MedViz conference*, September 7–9, 2016

Member of the organizing committee of the 2016 Abel Symposium on *Computation and Combinatorics in Dynamics, Stochastics and Control*, August 2016

Organizer of the *Bergen workshop on computational and applied mathematics: Mathematical modelling and computational medicine* <http://workshop2016.computationalmedicine.no>, January 18–19, 2016

Member of a working group on e-learning, Faculty of Engineering, HiB, 2015–

Project coordinator of an e-learning project supported by the Faculty of Engineering, HiB, 2015–

Course coordinator for MAT100, HiB, 2015–

Board member and treasurer, Bedriftidrettslaget at HiB, 2015–

Member of a working committee developing HiB’s Faculty of Engineering’s strategy for “profile and reputation 2016–2020”, 2015

Secretary of the COCO2010 conference, ICMAT, Madrid, Spain, April–June, 2010

Member of the Department Council, UoB, 2010

Student Member of “Programstyret”, UoB, 2006–2007

Student Member of the Library Council, UoB, 2005–2006

Student Member of the Department Council, UoB, 2006–2007

Membership in Scientific Societies

Norwegian Mathematical Society, 2003–present

American Mathematical Society, 2004–present