



Education

- 2006–present **Practical Didactic Studies**, *Stord/Haugesund University College*.
Part time education in practical didactics.
- 2004–2006 **PhD Applied Mathematics**, *University of Bergen*.
- 2002–2003 **Cand Scient (MS) Applied Mathematics**, *University of Bergen*.
- 1999–2002 **Cand Mag (BS) Applied Mathematics/Computer Science**, *University of Bergen*.
- 1979 **Born 27. Dec 1979**.

PhD Thesis

- title *Mathematical Imaging with Applications to MRI and Diffusion Tensor MRI*
- supervisors Hans Z. Munthe-Kaas, Arvid Lundervold and Xue-Cheng Tai
- description In my PhD thesis I studied various aspects of mathematical imaging; inverse scale space methods, level set methods, diffusion tensor imaging and shape adaptive transform methods. Available through Bergen Open Research Archive: hdl.handle.net/1956/2159

Master Thesis

- title *Variational Image Segmentation using Discontinuous Level Set Formulations*
- supervisor Xue-Cheng Tai
- description In my master thesis I studied image segmentation, by introducing a new piecewise constant level set formulation. The formulation is applicable for other inverse problems aswell.

Experience

- 2007–present **Researcher II**, *Center for Integrated Petroleum Research*.
Research Field: Computational and Modeling aspects of Microbial Enhanced Oil Recovery (MEOR). The project is funded by Statoil.
- 2004–2006 **PhD Studies**, *University of Bergen*.
The main focus of the research was on Diffusion Tensor Magnetic Resonance images of the human brain. The project was supported by the Norwegian Research Council.
- 2005 **Software Development**, *Unifob, University of Bergen*.
Development of a Matlab software system for automatic segmentation and measurement of cell co-culture images. The work was done for the research group of Jim Lorens at Department of Biomedicine, University of Bergen/Unifob.
- 2003 **Teaching Assistant**, *University of Bergen*.
Two semesters as teaching assistant. Topics: 1: Computational methods for Partial Differential Equations. 2: Mathematical Methods (Fourier, PDE, etc).

Languages

norwegian **Native**
english **Good**

Computer Skills

scientific Matlab
programming JAVA

Conferences/Visits

- 2007 **Workshop, Dagstuhl Seminar**, Germany.
Seminar Topic: Visualization and Processing of Tensor Fields
- 2006 **Research Visit**, *University of California Los Angeles*, USA.
Two week visit to Tony F. Chan's group
- 2006 **Research Visit**, *University of Saarland*, Saarbrücken, Germany.
Two week visit to Joachim Weickert's group
- 2005 **Research Visit**, *University of California Los Angeles*, USA.
Two week visit to Stanley Osher's group
- 2005 **PDE-Based Image Processing and Related Inverse Problems**, *Oslo*, Norway.
<http://www.cma.uio.no/conferences/2005>
- 2004 **ECCOMAS 2004**, *University of Jyväskylä*, Finland.
<http://www.mit.jyu.fi/eccomas2004/proceedings/proceed.html>
- 2003 **Research Visit**, *University of Bucharest*, Romania.
One month research visit to Lori Badaea at IMAR through a EUROMAT grant.

Scientific Publications

- [1]Oddvar Christiansen, Johan Lie, and Bernhard Burgeth. A dual operator algebraic method for regularization of matrix valued images. (Preprint), 2007.
- [2]Johan Lie, Bernhard Burgeth, and Oddvar Christiansen. An operator algebraic inverse scale space method for matrix images. (Preprint), 2007.
- [3]Ørjan Bergmann, Oddvar Christiansen, Johan Lie, and Arvid Lundervold. Shape-adaptive DCT for denoising of tensor valued 3D images. (Preprint), 2007.
- [4]Oddvar Christiansen, Tin-Man Lee, Johan Lie, Usha Sinha, and Tony F. Chan. Total variation regularization of matrix valued images. *International Journal of Biomedical Imaging. Special issue on Mathematics in Biomedical Imaging*, Vol: 2007, 2007. Available from: <http://www.hindawi.com/GetArticle.aspx?doi=10.1155/2007/27432>.
- [5]Johan Lie and Jan M. Nordbotten. Inverse scale spaces for nonlinear regularization. *Journal of Mathematical Imaging and Vision*, 27(1):41–50, 2007. Available from: <http://dx.doi.org/10.1007/s10851-006-9694-9>.
- [6]Johan Lie, Marius Lysaker, and Xue-Cheng Tai. A binary level set model and some applications to Mumford-Shah image segmentation. *IEEE Transactions on Image Processing*, 15(5):1171–1181, 2006. Available from: <http://dx.doi.org/10.1109/TIP.2005.863956>.
- [7]Johan Lie, Marius Lysaker, and Xue-Cheng Tai. A variant of the level set method and applications to image segmentation. *AMS Mathematics of Computation*, 75:1155–1174, 2006. Available from: <http://www.ams.org/mcom/2006-75-255/S0025-5718-06-01835-7/home.html>.
- [8]Johan Lie, Marius Lysaker, and Xue-Cheng Tai. Piecewise constant level set methods and image segmentation. In *Scale Space and PDE Methods in Computer Vision: 5th International Conference, Scale-Space 2005*, volume 3459 of *Lecture Notes in Computer Science*. Springer-Verlag GmbH, 2005. Available from: http://dx.doi.org/10.1007/11408031_49.

Family

I am married to Siv Øvrebotten Lie. We have two children, Ingrid and Arild.

References

Prof. Hans Z. Munthe-Kaas, Dept. Mathematics, University of Bergen,

Assoc. Prof. Arvid Lundervold, Dept. Biomedicine, University of Bergen,

Prof. Magne Espedal, Dept. Mathematics, University of Bergen.