



March
2012

[Dr. Anne C. Elster](#) – Advising

I work very closely with my graduate students and have so far supervised over 40 masters theses, many of which I help build published papers on, and several which have received prizes. I also supervise/co-supervise several PhD students. Together we have built up my HPC-Lab, a well-respected research lab in heterogeneous and GPU computing which regularly receives international visitors. We recently got several equipment grants, including a NOK 1 million grant from our Dean's office (awarded fall 2011, to be funded spring 2012)

See <http://research.idi.ntnu.no/hpc-lab> for more details.

POST DOCS SUPERVISED BY DR. ELSTER



1. **Ian Karlin** (PhD U of Colorado, Boulder 2011) (May 2011-Dec 2012)

Ian was supposed to be with my group until May 2012, but we ran into visa problems re. his wife, so he, unfortunately, left early. He did participate at both NORDUNET 2011 and SC 2011 on behalf of my group.



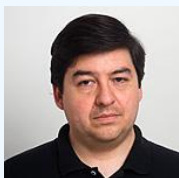
2. **Jan Perhac** (April 2010-April 2011) (ERCIM)

Jan was an active participant in my research group. He helped with the THOR project which we did with HPC-Lab visitor Jose Louis Vasquez-Poletti, from UCM, Spain.



3. **John Ryan** (2010)

John worked on heterogeneous cluster issues. He was supposed to stay longer, but decided to return to Ireland for a job there.




4. **Dr. Henrik R. Nagel** (2005-2007)


Henrik is currently at NTNU HPC Group at ITEA (Computing Center) His research focus is on using grid technology to integrate visualization and computations. Dr. Nagel also helped out with the organization of the SIMS 2005 conference that was held at NTNU in October 2005 and is the co-editor of its proceedings.

PHDs SUPERVISED OR EVALUATED OFFICIALLY BY DR. ELSTER

(The students' work is done at Dept. of Computer & Info Science at NTNU unless otherwise specified.)


2011/2012 – Current PhD-level supervisions:


- 

Jan Christian Meyer (PhD thesis submitted for review Fall 2011),
Anne C. Elster (main advisor)
Thesis title: "Performance Modeling og Heterogeneous Systems".
Expected to defend in Summer 2012 (when opponents can enjoy longer days here in Norway)
- 

Rune Erlend Jensen (PhD student – estimated to finish in 2013),
Anne C. Elster (main advisor)
Topic: Compiler-optimized BLAS kernals.

Rune won the Norsk Regnesentral's (NRs) NTNU prize for best masters thesis for his ["Techniques and Tools for Optimizing Codes on Modern Architectures: A Low-Level Approach"](#) (see Masters students supervised)
- Lane Holloway** (Univ. of Texas Austin, USA),
PhD proposal to be submitted spring 2012),
Anne C. Elster (co-advisor/committee member),
Prof. Don Fussel, Computer Science UT Austin (main advisor)

Topic: Dynamic Games (games whose story-line change depending on execution. Lane was a student in my Algorithms & Data structures class back in 2000. He started a PhD with a UT prof. some years late, then went to industry, and is now self-funning himself to "work on what interests me. He was one of my top students in the class. I wrote a recommendation for his partner in the class' projects for Stanford. She has now finished her PhD there and is teaching at a College in California
- 

Erik Smistad (PhD student),
Dr. Frank Lindseth (main advisor), **Anne C. Elster (co-advisor)**
Topic: Medical Imaging on GPUs.
- 

Ivar Ursin Nicolaisen (PhD student, starting March 29, 2012)
Anne C. Elster (main advisor), Alf B. Rustad, Statoil (co-advisor)

Ivar 's work is supported by my research grant from Statoil to

As of Sept 2011: Elster has one unfilled PhD position and has recruited at least 2 Norwegian students that are eager to start their PhD in her research group

2011 – External PhD evaluations:

1. **Michele Martone** (PhD Università degli Studi di Roma “Tor Vergata”, Facoltà di Ingegneria, [defense May 31, 2011](#)), Anne C. Elster (external EU evaluator), Profs. Salvatore Tucci and Salvatore Filippone (main advisors): [“A Quad-Tree Based Sparse BLAS Implementation for Shared Memory Parallel Computers”](#).
2. **Yong Liu** ([PhD Dept. of Informatics, Univ. of Tromsø, defended Feb 24, 2011](#)), Prof. Otto Anshus (main advisor), Prof. Brian Vinter (Copenhagen Univ., 1st Opponent), Anne C. Elster (2nd Opponent): [“Principle and Practice of Distributing Low and High Resolution Display Content from One Computer to Many Computers in Stand-alone or Display Wall Configurations”](#)

2010 and earlier

3. **Thorvald Natvig** (PhD thesis submitted for review June 2010, defended Dec. 2010) [Automatic Run-Time Communication and I/O Optimizations](#), **Anne C. Elster (main advisor)**. Job after PhD: Medalia, Palo Alto, CA, USA.
4. **Jo Skjermo** (PhD 2009), Main advisor: Prof. Keith Downing, **Anne C. Elster (3rd opponent)**. Title: *“Generation, Rendering and Animation of Polygon Tree Models”*
5. **Cyril Banino-Rokones** -- supervised by Elster 2003-2006, PhD 2007 w. Dr. Lasse Natvig as main advisor. Title: [Algorithmic and Scheduling Techniques for Heterogeneous and Distributed Computing \(pdf\)](#) - Now atYahoo!
6. **Nicolae-Zoran Constantinescu-Fülöps** (PhD 2008) Professor [Richard Blake](#) (main advisor), **Anne C. Elster (3rd opponent)** [A Desktop Grid Computing Approach for Scientific Computing and Visualization \(pdf\)](#)
7. **Roxana Diaconescu** (PhD 2002), Prof. Reidar Conradi (main advisor), Prof. Monica Lam (Stanford, 1st opponent), **Anne C. Elster (3rd opponent)** (The third opponent act as the administrator for the defense) Thesis title: *“Object-Based Concurrency for Data Parallel Applications: Programmability and Effectiveness”*.
8. [Penti Huttunen, First Opponent](#), PhD committee at Lappeenranta University of Technology, Finland, Dec. 2002 for Thesis Title: *Data-parallel computation in parallel and distributed environments* . Advisor: Dr. Jari Porras, 1st Opponent: Dr. Kimmo Koski, Nokia (now CSC Director), **2nd Opponent: Anne C. Elster.**

MASTERS THESES + SELECTED MASTER REPORTS SUPERVISED
(The students' work is done at Dept. of Computer & Info Science at NTNU with Anne C. Elster as the main advisor unless otherwise specified.)

2011/2012 On-going Master-level supervisions:

1.  **Kjetil Babington** (MTech IDI, Summer 2012)
MSProject (F 2011): Real-Time Ray Tracing for the HPC-Lab Snow Simulator
MS Thesis Topic: Ray tracing and Snow Simulation on GPU
2.  **Thomas Falch** (MTech IDI, Summer 2012)
Dag Breiby (NTNU Physics Dept, co-advisor)
Topic: Physics simulations and visualization on GPU.
Thomas will likely continue in my group to a PhD starting fall 2012.
3.  **Geir Josten Lien** (Master of Science IDI, to finish Summer 2012),
Topic: OpenCL BLAS.
B.Sc. from HIST (South Trøndelag College)
4.  **Jan Rovde** (MTech IDI, Summer 2012)
Topic: SPH and snow simulation on GPU
5.  **Frederik Magnus Johansen (MJ) Vestre** (MTech IDI, Summer '12)
Topic: Snow Simulation in OpenCL with an eye towards mobile platforms
6.  **Johannes Kvam** (MTech Cybernetics, Summer 2012)
Prof. Bjørn Angelsen (Med. Tech/Cybernetics, main advisor), Dr. Elster I co-supervisor
Topic: Medical image processing

2011 MS theses completed with Dr. Elster as main advisor as of Sept 2011

1. **Yngve Sneen Lindal** (Master og Technology, thesis, June 2011), Anne C. Elster (main advisor), Sverre Jarp (CTO, CERN, co-advisor): "[Optimizing a High-Energy Physics \(HEP\) Toolkit on Heterogeneous Architectures](#)".
2. **Fredrik Fossum** (Master og Technology, thesis, June 2011), Anne C. Elster (main advisor): "[Real-Time Rigid Body Interactions](#)" (on GPU)
3. **Jarle Erdal Steinsland** (Master og Technology, thesis, June 2011), Anne C. Elster (main advisor). "[Auto-tunable GPU BLAS](#)"
4. **Bent Ove Stinessen** (Master og Technology, thesis, June 2011), Anne C. Elster (main advisor), Dr. Alf Birger Rustad (Statoil Research, co-advisor): "Profiling, Optimization and Parallelization of Seismic Inversion Code".
5. **Thor Kristian Valderhaug** (Master og Technology, thesis, June 2011), Anne C. Elster (main advisor), Dr. Frank Lindseth (SINTEF Med Tech/NTNU co-advisor): "[The Lattice Boltzmann Simulation on Multi-GPU Systems](#)".

2010

6. **Ahmed A. Aqrabi** (Masters thesis, June 2010, Anne C. Elster (main advisor): "[Effects of Compression on Data Intensive Algorithms](#)", led to PARA 2010 presentation and IPDPS 2011 workshop paper (MTAAP)
7. **Aleksander Gjermundsen** (Masters thesis, June 2010, Anne C. Elster (main advisor): "CPU and GPU Co-Processing for Sound". Led to paper presented at PARA 2010.
8. **Andreas Hysing** (Masters thesis, July 2010, Anne C. Elster (main advisor), Dr. Alf Birger Rustad (Statoil Research, co-advisor): "Parallel Seismic Inversion for Shared Memory Systems".
9. **Øystein Krog** (Masters thesis, June 2010, Anne C. Elster (main advisor): "[GPU-based Real-Time Snow Avalanche Simulations](#)". Led to paper presented at PARA 2010.
10. **Holger Ludvigsen** (Masters thesis, June 2010, Anne C. Elster (main advisor), Frank Lindseth (co-advisor): "Real-Time GPU-Based 3D Ultrasound Reconstruction and Visualization".

2009

11. **Eirik Ola Aksnes** (Master of Technology thesis, July 2009), Anne C. Elster (main advisor), Ståle Fjeldstad and Atle Rudshaug, Numerical Rocks (co-advisors) "[Simulation of Fluid Flow Through Porous Rocks on Modern GPUs](#)". Received National IBM prize, 2009 (shared with Erik Ola Aksnes and one Petroleum student)
12. **Daniel Haugen** (Master of Technology thesis, July 2009), Anne C. Elster (main advisor), Tore Fevang, Schlumberger (co-advisor): "[Seismic Data Compression and GPU Memory Latency](#)"
13. **Åsmund Herikstad** (Master of Technology thesis, July 2009), Anne C. Elster (main advisor), Svein-Erik Måsøy, MedTek, NTNU (co-advisor) "Parallel Techniques for Estimation and Correction of Aberration in Medical Ultrasound Imaging"
14. **Owe Johansen** (Masters thesis, July 2009), Anne C. Elster (main advisor), John Hybertsen and Jon André Haugen, Statoil (co-advisors): "[Seismic Shot Processing on GPU](#)"
15. **Daniele Giuseppe Spampinato** (Master of Technology thesis, July 2009), Anne C. Elster (main advisor): "[Modeling Communication on Multi-GPU Systems](#)". Received

National IBM prize, 2009 (shared with Erik Ola Aksnes and one Petroleum student)

16. **Rune Johan Hovland** (Master of Technology thesis, June 2009), Anne C. Elster (main advisor), Magnus Lie Hetland (co-advisor): ["Throughput Computing on Future GPUs"](#)
17. **Henrik Hesland** (Master of Technology thesis, June 2009), Anne C. Elster (main advisor), Thorvald Natvig (co-advisor): ["GPU-Enabled Interactive Pore Detection for 3D Rock Visualization "](#)
18. **Rune Erlend Jensen** (Master of Science thesis, May 2009), Anne C. Elster (main advisor): ["Techniques and Tools for Optimizing Codes on Modern Architectures: A Low-Level Approach"](#)
19. **Robin Eidissen** (Masters thesis, January 2009), Anne C. Elster (main advisor): ["Utilizing GPUs for Real-Time Visualization of Snow"](#)

2008

20. **Atle Rudshaug** (Masters thesis, June 2008), Anne C. Elster (main advisor), Optimizing & Parallelizing a Large Commercial Code for Modeling Oil-well Networks – joint work with Yggdrasil, Norwegian Oils service company.
21. **Andreas Bach** (Masters thesis, September 2008), Anne C. Elster (main advisor) **"Profiling and Optimizing a Seismic Application on Modern Architectures"** -- joint project with Statoil

2007

22. **Erik Axel Nielsen** (Masters thesis, June 2007), Anne C. Elster (main advisor) [Real-time Wavelet Filtering on the GPU](#)
-- joint project with GE Healthcare. *40 times GPU speedup of algorithm led to our implementation being adopted the same fall in their high-end cardiovascular ultrasound scanner.*
23. **Idar Borlaug** (Masters thesis, June 2007), Anne C. Elster (main advisor) [Seismic Processing Using Parallel 3D FMM](#)
24. **Knut Imar Hagen** (Masters thesis, June 2007), Anne C. Elster (main advisor) [Fault-tolerance for MPI Codes on Computation Clusters](#) joint project with Statoil Research.
25. **Christian Larsen** (Masters thesis, June 2007), Anne C. Elster (main advisor), Tore Fevang, Schlumberger (co-advisor): ["Framework for Polygonal Structures Computations on Clusters"](#)
26. **Nils Magnus Larsgård** (Masters thesis, June 2007), Anne C. Elster (main advisor): [Framework for Converting MPI Codes to Hybrid OpenMP/MPI Codes](#)
27. **Thibault Collet** (Masters thesis, July 2007), Anne C. Elster (advisor): [Massively Online Games with Food Chains](#)

2006

28. **Thorvald Natvig** (Masters thesis, January 2006), Anne C. Elster (main advisor): **Automatic Optimization of MPI Applications**
29. **Øystein Borg** (Masters thesis, June 2006), Anne C. Elster (main badvisor) Håkon Bugge, SCALI (co-supervisor): [Dynamic Selction of MPI Intra-copy Routines Based on Program Characteristics](#)
30. **Ingar Saltvik** (Masters thesis, June 2006), Anne C. Elster (main advisor) **Parallel Methods for Real-Time Visualization of Snow**

2005

31. **Håvard Bjerke** (Masters thesis, July 2005), Anne C. Elster (main advisor), Sverre Jarp, CERN and Dan Magenheimer, HP Labs, Fort Collins, CO, USA (Co-supervisor): [a href="http://openlab-mu-internal.web.cern.ch/openlab-mu-internal/Documents/2_Technical_Documents/Master_thesis/Thesis_HavardBjerke.pdf"](http://openlab-mu-internal.web.cern.ch/openlab-mu-internal/Documents/2_Technical_Documents/Master_thesis/Thesis_HavardBjerke.pdf) "**HPC Virtualization with Xen on Itanium**
32. **Rune Johan Andresen** (Masters thesis, July 2005), Anne C. Elster (main advisor), Rainer Toebbicke and Bernard Antoine, CERN (Co-supervisors): **HPC File Server Monitoring and Tuning**
33. **Andreas Braathen** (Masters thesis, August 2005), Anne C. Elster (main advisor), Jørn A. Amundsen (NTNU) and Alastair Bland, CERN (Co-advisors): **Hardware and Software Surveillance**

2004

34. **Glen Hisdal** (Masters thesis, June 2004), Anne C. Elster (main advisor), Sverre Jarp, CERN (Co-supervisor): **Service Discovery Techniques for Distributed Systems using SmartFrog**. *Results presented as part of [PARA 2006 talk by Elster et al.](#)*
35. **Tor Arvid Lund** (Masters thesis, June 2004), Anne C. Elster (main advisor), Jørn A. Amundsen (co-advisor) "Porting a Monte Carlo Code from Shared Memory to Computational Clusters" joint project with Jo Smiseth and Eiving Smørgrav, NTNU Dept. of Physics.
36. **Jan Christian Meyer** (Masters thesis, June 2004), Anne C. Elster (main advisor), **Load Balancing Visualisation Servers** in collaborations with Schlumberger Voxel Vision, Trondheim, Norway.
37. **Frode Nilsen** (Masters thesis, June 2004), Anne C. Elster (main advisor), **Portal Development for Grid Technologies** joint project w/ NOTUR, The Norwegian National High-Performance Computing Program.
38. **Morten Rodal** (Masters thesis, June 2004), Anne C. Elster (main advisor), Kjetil Hokstad, Statoil (co-advisor) **Scalability of Seismic Codes on Computational Clusters** joint project w/ Statoil Research
39. **Einar Råberg Rosenvinge** (Masters thesis, June 2004), Anne C. Elster (main advisor), Cyril Banino (co-supervisor) [*On-line Task Scheduling on Heterogeneous Clusters: An Experimental Study*](#) (led to paper presented at PARA'04)

2003

40. **Robin Holtet** (Masters thesis, June 2003), Anne C. Elster (main advisor): [*"Communications-reducing Stencil-based Algorithms and Methods"*](#)
41. **Torbjørn Vik** (Masters thesis, June 2003), Anne C. Elster (main advisor): **Real-Time Visual Simulation of Smoke**
42. **Åsmund Østvold** (Masters thesis, June 2003), Anne C. Elster (main advisor), Håkon Bugge, Scali AS (so-supervisor): Tidsmåleteknikker for MPI kollektive kommunikasjons operasjoner

2002 and earlier

1. **Charles de Vane** (Master's thesis, Computer Science, Cornell University – Anne C. Elster (co-advisor), Main advisor: Prof. Keshav Pingali: Topic: "Parallel Choleski Factorization on the BBN System".

**SELECTED MASTER REPORTS & BACHELOR'S HONORS THESES
SUPERVISED BY DR. ELSTER** (The students' work is done at Dept. of Computer
& Info Science at NTNU unless otherwise specified.)

2011

1. **Hallgeir Lien** (Masters project, Fall 2011), Anne C. Elster (main advisor), Dr. Jo Skjermo (Vegdirektoratet, co-advisor). Topic: Snow simulations and roads on GPU.

2010

1. Fredrik Fossum (Masters project, Dec 21, 2011), Anne C. Elster (main advisor)
["Surface Tension in Smoothed Particle Hydrodynamics on the GPU"](#).

2009

2. **Ahmed A. Aqrawi** (Masters project, Dec 2009), Anne C. Elster (main advisor), Victor Aarre, Schlumberger Stavanger (co-advisor): ["3D Convolution of Large Datasets on Modern GPUs"](#).
3. **Eirik Ola Aksnes and Henrik Hesland** (Masters Project, Jan 2009), Anne C. Elster (main advisor): ["GPU Techniques for Porous Rock Visualization"](#)

2008

4. **Rune Hovland** (Masters project, Dec 2008), Anne C. Elster (main advisor): ["Latency and Bandwidth Impact on GPU Systems"](#) (led to ParCo 2009 paper)
5. **Daniele Giuseppe Spampinato** (Masters Project, December 2008), Anne C. Elster (main supervisor): ["Linear Optimizations with CUDA"](#) (led to IPDPS 2009 paper)

2006

6. **Idar Borlaug and Knut Imar Hagen** (MS Project), Anne C. Elster (main advisor): ["Parallelization of an Open Source Game"](#)
7. **Christian Larsen** (MS Project, December 2006), Anne C. Elster (main advisor): [Utilizing GPUs on Cluster Computers](#) -- joint project with Schumberger. Presented at Stanford 50 and UT Austin ECE seminar 2006/2007.

2003

8. **Glenn Hisdal** (Master Project, Dec. 2003), Anne C. Elster (main advisor):
"SmartFrog and SLP: An Introduction to SmartFrog and the Service Location Protocol"
" in collaborations with CERN.

2002 and earlier

9. **Jostein Tveit** (Masters project, Dec 2002), Anne C. Elster (main advisor): “Secure MPI”. He later took a wrote a masters with Q2S at NTNU and now works for BBS.
10. **Paul Sack** (Honors Bachelor thesis, ECE, UT Austin, 2001) – Anne C. Elster (advisor), his honors thesis + subsequent summer job at NTNU , led to our PARA 2002 paper.

NOTE: Elster joined NTNU in 2001

This document was last updated March 30, 2012.