

Eivind Fonn

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PERSONALIA

I am a 31 year old Norwegian, born, grown up and with undergraduate studies in Trondheim, Norway. Moved to Zürich, Switzerland for graduate studies. Interested in mathematics, computing, programming, photography, chess and books.



Ph.D., computational science 2009-09 → 2013-11
ETH Zürich, Zürich, Switzerland
Solving high-dimensional kinetic transport equations, bridging the “curse of dimensionality”. Particular focus on Shearlet frames and the Boltzmann equation.

Master of Technology, industrial mathematics 2004-08 → 2009-06
NTNU, Trondheim, Norway
Specialisation in numerical analysis and differential geometry.

EXPERIENCE

Research Scientist 2014-05 → present
SINTEF Applied Mathematics, Trondheim, Norway
A variety of projects (see below), mostly large-scale parallel simulations using isogeometric analysis finite element methods.

Associate professor 2016-01 → 2016-06
NTNU, Trondheim, Norway
Part-time faculty position, lecturer of the TMA4280 *Introduction to Supercomputing* course.

Ph.D. student 2009-09 → 2013-11
ETH Zürich, Zürich, Switzerland
Solving high-dimensional kinetic transport equations, bridging the “curse of dimensionality”. Implementation in Matlab and Python. Includes a 40% teaching load.

Software engineer Summer 2009
Jeeves, Trondheim, Norway
Implemented a translation tool built on Google Translate, which can read and write a number of different formats (such as Microsoft Word and database tables), with some facilities for correcting erroneous translations and learning.

Software engineer Summer 2008
Yahoo! Technologies, Trondheim, Norway
Implemented an adapter between MySQL and Yahoo’s internal vertical search platform Vespa, together with several demo cases. Responsibilities included the entire process, from design to completion.

SKILLS

- *Programming languages*: I am an expert in Python, and I am proficient in C, C++ and Matlab, and some lisp dialects. I have experience with Java, C#, PHP and Javascript, although this can be 5 to 10 years old. I dabble in Haskell and Rust.
- *Databases*: PostgreSQL when possible, MySQL when necessary.
- *Other*: I have a decade of experience running Linux distributions for personal use, and I have administered several servers.
- *Languages*: Fluent Norwegian and English, reasonable German.

AWARDS

- Winnie and Ragnar Mathisen's award for best student of technology or architecture in the 2009 graduating class at NTNU.
- The Norwegian Computing Centre's award for best master thesis in mathematics or ICT at NTNU in 2008/09.
- The Stubban award for the most promising master candidate in mathematics at NTNU among the 2009 graduating class.

ASSORTED

- Part organiser of the inaugural edition of KoMiN—a now annual conference for mathematics students in Norway.
- Designed problems, graded answers and maintained the website for the Abel Competition, the Norwegian mathematical olympiad for high school students.
- Driving force and main organiser of the first two editions of the Norwegian Rubik's Cube Championship.
- Former national record holder in Rubik's Cube speedsolving and speedsolving while blindfolded (single and multiple).

POSITIONS OF TRUST

- Webmaster¹ and board member for the IAESTE Local Committee Zürich for four years (2010-2013).
- Recognised by the World Cubing Association as a competition delegate.
- Webmaster and board member for the Student association Nabla² at NTNU for three years (2005-2007).

SOCIAL SITES

- Github: <http://github.com/TheBB>
- LinkedIn: <http://www.linkedin.com/pub/eivind-fonn/5/364/67>

PROJECTS

eSushi: Prediction and optimization of fish hauls 2016-06 → 2016-08

Partners: SINTEF, a coalition of seafood companies

This project aims to predict fish distribution in the Norwegian and Barents sea to optimize catch rates for the fishing industry.

- Performed preliminary statistical analysis (Gaussian processes) to determine which variables explain the variation in fish hauls, and which do not.

HF-PFC: Hydraulic fracture (phase field code)

2015-07 → present

Partners: SINTEF, Statoil

A continuation of the FFG project (see below), this project aims to extend the spline-based poroelasticity solver with fracture mechanics, and to test the resulting product on real-scale problems and data.

- Implemented a coupling between the poroelasticity solver from FFG (see below) and a phase field solver for fracture.
- Presented results at 12th WCCM 2016.

¹<http://iaeste.ch/>

²<http://nabla.no>

FFG: Fractures, flow and geomechanics 2014-12 → 2015-06
The internally funded FFG project aims to develop simulation tools for coupled flow through porous media, elasticity and fracture.

- Implemented a spline-based solver for poroelasticity problems.
- Presented results at 3rd IGA 2015.

LS-TES: Large Scale Thermal Energy Storage 2014-09
Partner: SINTEF, NEST, NTNU

The LS-TES project aims to develop effective storage solutions for thermal energy. The project involves a coupled heat flow and thermal elasticity simulation.

- Implemented a modular and fully parametrizable exact spline-based mesh generator for heat reservoirs in various configurations.

FSI-WT: Fluid-structure interaction for wind turbines 2014-05 → 2014-12
Partners: SINTEF, NTNU, MET, FFI, Statoil, TrønderEnergi, Kjeller Vindteknikk, Windsim

The FSI-WT project aims to develop robust and efficient numerical simulation tools for coupled fluid-structure interaction simulation of full scale wind turbines, with a particular emphasis on offshore wind power.

- Implemented and presented a modular, fully parametrizable and efficient spline-based mesh generator for wind turbine blades.
- Presented results at 27th NSCM 2014 and 12th Deepwind 2015.

Aligulac 2011-04 → present
Voluntary and private

The Aligulac project³, is a historical database of professional Starcraft II results and a Bayesian rating system developed by myself, now maintained by a team of about 15 volunteers.

PUBLICATIONS

Wake modeling in complex terrain using a hybrid Eulerian-Lagrangian Split Solver.
F. G. Fuchs, A. Rasheed, M. Tabib and **E. Fonn**. *Accepted to TORQUE 2016*.

Spline based mesh generator for high fidelity simulation of flow around turbine blades.
E. Fonn, A. Rasheed, A. M. Kvarving and T. Kvamsdal. *Accepted to Energy Procedia, 2015*.

Isogeometric methods for CFD and FSI-simulation of flow around turbine blades.
T. V. Opstal, **E. Fonn**, T. Kvamsdal, A. M. Kvarving, K. M. Mathisen, K. Nordanger, K. M. Okstad, A. Rasheed and M. Tabib. *Accepted to Energy Procedia, 2015*.

Spline based mesh generator for wind turbine blades.
E. Fonn, A. Rasheed, A. M. Kvarving and T. Kvamsdal. *Extended abstract, 27th Nordic Seminar on Computational Mechanics, 2014*.

Approximation in space and velocity for kinetic transport equations.
E. Fonn. *Dissertation, ETH Zürich, 2014*.
10.3929/ethz-a-0100602019

Polar spectral scheme for the spatially homogeneous Boltzmann equation.
E. Fonn, P. Grohs and R. Hiptmair. *Technical report, SAM, ETH Zürich, 2014*.

³<http://aligulac.com/>

Hyperbolic cross approximation for the spatially homogeneous Boltzmann equation.
E. Fonn, P. Grohs and R. Hiptmair. *IMA Journal of Numerical Analysis*, 2014.
10.1093/imanum/dru042

PRESENTATIONS

On mixed isogeometric analysis of poroelasticity.

E. Fonn, Y. W. Bekele, T. Kvamsdal, A. M. Kvarving, S. Nordal. *12th World Congress of Computational Mechanics*, 2016.

A mixed-order isogeometry solver for poroelasticity problems.

E. Fonn, Y. W. Bekele, A. M. Kvarving, T. Kvamsdal, S. Nordal. *3rd International Conference on Isogeometric Analysis*, 2015.

FSI of wind turbine blades.

T. V. Opstal, **E. Fonn**, T. Kvamsdal, A. M. Kvarving, K. M. Mathisen, K. Nordanger, K. M. Okstad, A. Rasheed, M. Tabib. *6th International Conference on Coupled Problems in Science and Engineering*, 2015.

Strip theory approach for FSI of offshore wind turbine blades.

T. Kvamsdal, **E. Fonn**, A. M. Kvarving, K. M. Mathisen, K. Nordanger, K. M. Okstad, T. V. Opstal, A. Rasheed and M. Tabib. *6th International Conference on Coupled Problems in Science and Engineering*, 2015.

Spline based mesh generator for wind turbine blades.

E. Fonn, A. Rasheed, A. M. Kvarving, T. Kvamsdal. *27th Nordic Seminar on Computational Mechanics*, 2014.

POSTERS

Spline based mesh generator for high fidelity simulation of flow around turbine blades.

E. Fonn, A. Rasheed, A. M. Kvarving, T. Kvamsdal. *12th Deep Sea Offshore Wind R&D Conference, Deepwind 2015*.

Isogeometric methods for CFD and FSI-simulation of flow around turbine blades.

T. V. Opstal, **E. Fonn**, T. Kvamsdal, A. M. Kvarving, K. M. Mathisen, K. Nordanger, K. M. Okstad, A. Rasheed, M. Tabib. *12th Deep Sea Offshore Wind R&D Conference, Deepwind 2015*.

Strip theory approach for FSI-simulation of flow around turbine blades.

K. Nordanger, T. Kvamsdal, A. M. Kvarving, K. Nordanger, A. Rasheed, M. Tabib, **E. Fonn**, T. V. Opstal. *12th Deep Sea Offshore Wind R&D Conference, Deepwind 2015*.

3D beam element for FSI-simulation of flow around turbine blades.

K. M. Okstad, K. M. Mathisen, T. Kvamsdal, A. M. Kvarving, K. Nordanger, A. Rasheed, M. Tabib, **E. Fonn**, T. V. Opstal. *12th Deep Sea Offshore Wind R&D Conference, Deepwind 2015*.

3D CFD and FSI-simulation of flow around turbine blades.

A. M. Kvarving, T. Kvamsdal, A. Rasheed, K. M. Okstad, **E. Fonn**, K. M. Mathisen, K. Nordanger, T. V. Opstal, M. Tabib. *12th Deep Sea Offshore Wind R&D Conference, Deepwind 2015*.