Curriculum Vitae for Trygve Bærland

Personal information

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Born:	11.09.1991		

Summary

Holds a civil engineering degree in industrial mathematics from NTNU, and a Ph.D. at the department of mathematics, University of Oslo. Excellent analytical skills with a strong foundation in mathematics and physics. Has written computational code extensively throughout work in industry and research.

Technical skills

Languages	Python, C and C++, Fortran, Matlab
Tools	Git, Linux, Docker, Confluence, Jira, LaTex, SWIG, Boost libraries, FEniCS, MFEM, Pytest, Doctest, Sphinx

Education

2015 – 2019	Ph.D. in mathematics, University of Oslo. Preconditioners for discretizations of multiphysics problems. The work included developing efficient solvers, proving mathematically their robustness, and developing numerical software to exhibit their efficacy. Research results were published in scientific journals and presented at conferences.
2010 – 2015	Civil engineer in industrial mathematics from the norwegian university of science and technology, NTNU. Master's thesis was on the analysis of spectral methods on anamolous diffusion equations. Many courses in physics, mathematics and computer science throughout the education.

Professional experience

2019 –	Consultant, Expert Analytics
2015	Maple T.A. in course on multi-variable calculus, NTNU. Creating electronic exercises and guiding students in their course work.
2014	Summer internship at Sintef MARINTEK, construction technique. Benchmarking numerous fast Fourier transform implementations in Fortran, C, and CUDA.
2014	Lead teaching assistant in course on linear algebra, NTNU. Responsible for guiding and helping the other teaching assistants in the course.
2012 – 2013	Summer internships as pricing analyst for If skadeforsikring, liability insurance. Worked on, amongst other things, designing and implementing new pricing models for corporate insurances.
2012 – 2013	Film club manager for Studentersamfundets Filmklubb. The film club had weekly movie screenings throughout the school year. Responsibilities included acquiring screening rights, organizing events, as well as working with the treasurer on budget and accounting.
2011 – 2012	Treasurer for the cultural committee at Studentersamfundet in Trondheim. The cultural committee is responsible for organizing events during weekdays at Studentersamfundet in Trondheim. The treasurer is responsible for working out yearly budgets and accounting for the committee. Responsibilities also included organizing cultural events like debates and lectures.
2011 – 2014	Teaching assistant in various courses on mathematics at NTNU. Introductory courses on analysis and calculus.
2010 – 2011	Work during summers as home help for Drammen municipality.

Languages

Norwegian	Native speaker and writer
English	Speak and write fluently

Some interests and hobbies

Technology	programming, numerical software
Personal	sewing, tennis, playing music

Extended descriptions of selected projects

Activity	Short term production planning with Statkraft
Period	08/2019-12/2020
Role	Backend developer
Staffing	3-5 developers, 3-7 project owners, 1 project manager
Volume	50-100 %

Description	Trygve worked with development of a tool for hydro power production planning for Statkraft. Here he built a system for solving various optimization problems on demand from either Python scripts or web applications.
Tools	Python, C++, Angular, Apache

Activity	Analysis platform development with Statkraft
Period	02/2018-12/2020
Role	Developer
Volume	50-100 %
Description	Trygve worked with development, maintenance and surveillance on the computer clusters used in many of Statkraft's analysis pipelines.
Tools	Python, C++, Bokeh, Gitlab, systemd

Activity	Forecasting models for balancing power markets with Cognite and Hafslund Eco
Period	01/2021-06/2021
Role	Data scientist
Staffing	3 developers, 1 domain expert, 2 project owners and 1 project manager.
Volume	100 %
Description	Trygve worked with the development of price forecasting models based on machine learning for the intraday- and regulating power markets, whose function is to resolve imbalances between production and consumption in the power grid. The models were set in production on Cognite's cloud infrastructure, and a GUI was built for traders to view the predictions in a context to help in their decision making.
Tools	Python, scikit-learn, XGBoost, Cognite Data Fusion

Publications

Journal	Computational Methods in Applied Mathematics
Date	June 2017
Authors	Trygve Bærland, Jeonghun J. Lee, Kent-Andre Mardal, Ragnar Winther
Title	Weakly Imposed Symmetry and Robust Preconditioners for Biot's Consolidation Model
DOI	https://doi.org/10.1515/cmam-2017-0016

Journal	Astronomy & Astrophysics
Date	October 2017
Authors	D.S. Seljebotn, T. Bærland, H.K. Eriksen, K.-A. Mardal, I.K. Wehus
Title	Multi-resolution Bayesian CMB component separation through Wiener filtering with pseudo-inverse preconditioner
DOI	https://doi.org/10.1051/0004-6361/201732037

Journal	SIAM Journal on Scientific Computing
Date	April 2019
Authors	Trygve Bærland, Miroslav Kuchta, Kent-Andre Mardal
Title	Multigrid Methods for Discrete Fractional Sobolev Spaces
DOI	https://doi.org/10.1137/18M1191488

Journal	Numerical Methods for Partial Differential Equations
Date	July 2020
Authors	Trygve Bærland, Miroslav Kuchta, Kent-Andre Mardal, Travis Thompson
Title	An observation on the uniform preconditioners for the mixed Darcy problem
DOI	https://doi.org/10.1002/num.22500