David Eriksson
Curriculum Vitæ

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○ https://github.com/dme65/

Education

2014 – Present	**Cornell University** • Ph.D. in Applied Mathematics, expected May 2019 • TA award in Computer Science, Spring 2016 • Overall TA rating: 4.8/5.0 • GPA: 4.22/4.0 (current)
2012 – 2014	**Chalmers University of Technology** • M.Sc. in Engineering Mathematics and Computational Science • Graduated top of class • GPA: 5.0/5.0
2008 – 2011	**Chalmers University of Technology** • B.Sc. in Mathematics • Graduated top of class • GPA: 4.92/5.0

Research Interests

Surrogate Optimization, Numerical Linear Algebra, Scientific Computing, High-Performance Computing, Scientific Software, Machine Learning, Numerical Analysis.

Current Research

Asynchrony and elasticity in surrogate optimization
- Designing flexible and fault tolerant asynchronous surrogate optimization algorithms.
- Using elasticity in modern cloud platforms.

Global optimization with additional information
- Developing algorithms with provable convergence rates for global optimization problems.

Structured solvers
- Constructing fast solvers for surrogate optimization, machine learning, and problems with Kronecker structure.

Software packages
- Developing asynchronous surrogate optimization software:
  – pySOT (github.com/dme65/pySOT)
  – SOT (github.com/dme65/SOT)

Awards

2016	**Teaching Assistant Award in Computer Science** *Cornell University*
2014	**Richard & Alice Netter Fellowship** *Thanks to Scandinavia*
2014	**Fritz O Fernstroms Scholarship** *The Sweden-America Foundation*
2011	**Anna Whitlock Scholarship** *Anna Whitlock's Foundation*

Work Experience

The MathWorks — May. 2017 – Aug. 2017
Software Developer — Natick, MA, USA
Global Optimization

- Implemented an asynchronous surrogate optimization framework.
- Performed design review, code review, unit testing, and benchmarking.
- Gave several internal talks and software tutorials.
- Helped internal customers solve challenging optimization problems.

Fraunhofer – Chalmers Centre — Mar. 2014 – July 2014
Applied Researcher — Gothenburg, Sweden
Point Cloud Visualization

- Developed algorithms for visualizing point clouds with billions of points.
- Used these algorithms to design a visualization software in C++ capable of rendering 50+ FPS with unlimited detail on a standard graphics card.

Fraunhofer – Chalmers Centre — Sept. 2012 – Mar. 2014
Contracted Student — Gothenburg, Sweden
Computational Geometry

- Constructed out-of-core algorithms for shortest distance computations between a point cloud with billions of points and a geometric object.
- Satisfied the heavy memory requirements by only keeping the relevant points in memory at a given time.
- Derived sharp criteria for when a specific subset of the point cloud can contain the point closest to the geometric object.

NASA Goddard Space Flight Center — June 2013 – Sept. 2013
Data Analyst — Greenbelt, MD, USA
Tropospheric Delay Ray Tracing

- Computed tropospheric delays by solving the Eikonal equation numerically through the weather model data.
- Showed a substantial improvement in baseline length and station positions.

NASA Goddard Space Flight Center — June 2011 – June 2012
Data Analyst — Greenbelt, MD, USA
Mass Loading

- Computed mass loading displacements due to changes in water mass and ocean bottom pressure.
- Convolved a loading Green's function with the global mass loading field.
- Found significant improvements in baseline lengths and station positions.

Extracurricular Activity

2016	**Argonne Training Program on Extreme-Scale Computing (ATPESC)** *Argonne National Labs* July 31 – Aug 12
2016 – Present	**President of the Scientific Software Club** *Cornell University* cornell-ssw.github.io

Computer Skills

Python, C++, MATLAB, C, UNIX, LATEX, Git, OpenMP, MPI, CUDA.

Journal Publications

March 2016	**Fast exact shortest distance queries for massive point clouds** *Graphical Models* Vol. 84, pages 28-37 (with E. Shellshear)
Dec. 2014	**Tropospheric delay raytracing applied in VLBI analysis** *Journal of Geophysical Research* Vol. 119, Issue 12, pages 9156–9170 (with D. S. MacMillan and J. M. Gipson)
July 2014	**Continental hydrology loading observed by VLBI measurements** *Journal of Geodesy* Vol. 88, Issue 7, pages 675-690 (with D. S. MacMillan)

Conference Proceedings

Sept. 2014	**Approximate distance queries for path-planning in massive point clouds** *11th International Conference on Informatics in Control, Automation and Robotics (ICINCO)* Vol. 2, pages 20-28, IEEE, Vienna, Austria (with E. Shellshear)
Aug. 2013	**Nontidal ocean loading observed by VLBI measurements** *21st Meeting of the European VLBI Group for Geodesy and Astronomy* Vol. 1, pages 135-140, Espoo, Finland (with D. S. MacMillan)
Mar. 2012	**Continental hydrology loading observed by VLBI measurements** *IVS 2012 General Meeting Proceedings* pages 415-419, Madrid, Spain (with D. S. MacMillan)

Presentations

Mar. 2017	**Global optimization with Native space semi-norm bounds** *SIAM CSE, 2017* Atlanta, GA
June. 2016	**Asynchronous surrogate optimization in Python (pySOT + POAP)** *Computational Methods in Water Resources, 2016* Toronto, Canada
Aug. 2013	**Atmospheric ray tracing and its impact in VLBI analysis** NASA Goddard Space Flight Center, Greenbelt, MD (with D. S. MacMillan and J. M. Gipson)
Dec. 2012	**Explaining the VLBI estimated degree-1 load variation via atmospheric, oceanic, and hydrological mass variations** *American Geophysical Union, Fall Meeting 2012* San Francisco, CA (with D. S. MacMillan)
Nov. 2011	**Mass loading in VLBI analysis** NASA Goddard Space Flight Center, Greenbelt, MD (with D. S. MacMillan)