Jeffrey M. Hokanson

Curriculum Vitae · 4 June 2019

Department of Computer Science
University of Colorado at Boulder
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Education

Ph.D. Computational and Applied Mathematics, Rice University, December 2013
Thesis: *Numerically Stable and Statistically Efficient Algorithms for Large Scale Exponential Fitting*
Advisors: Mark Embree and Steven Cox

M.A. Computational and Applied Mathematics, Rice University, May 2009
Thesis: *Magnetic Damping of an Elastic Conductor*
Advisors: Mark Embree and Steven Cox

B.S. Physics, Rice University, May 2007, cum laude

Appointments

Postdoctoral Fellow, University of Colorado at Boulder (September 2017 – present)
Supervisor: Paul G. Constantine

Postdoctoral Fellow, Colorado School of Mines (October 2016 – September 2017)
Supervisor: Paul G. Constantine

Postdoctoral Fellow, University of Texas MD Anderson Cancer Center (March 2014 – September 2016)
Supervisor: Jared Burks

Grants

Cancer Center Support Grant: New Technology Grant PHS398
Web User Interface for High Parametric Analysis (PI)
Co-PI: Jared Burks
$30,000 (2014)

Journal Publications

4. **Jeffrey M. Hokanson** and Paul G. Constantine
Data-driven Polynomial Ridge Approximation Using Variable Projection
SIAM Journal on Scientific Computing, Volume 40 No. 3 (2018) pp. A1566-A1589
DOI:10.1137/17M1117690, arXiv:1702.05859

3. **Jeffrey M. Hokanson**
Projected Nonlinear Least Squares for Exponential Fitting
SIAM Journal on Scientific Computing, Volume 39 No. 6 (2017) pp. A3107–A3128
DOI:10.1137/16M1084067, arXiv:1508.05890

2. Paul G. Constantine, Armin Eftekhari, **Jeffrey Hokanson**, and Rachel A. Ward
A Near-stationary Subspace for Ridge Approximation
Computer Methods in Applied Mechanics and Engineering, Volume 326 (Nov 2017) pp. 402–421
DOI:10.1016/j.cma.2017.07.038, arXiv:1606.01929

1. Steven J. Cox, Mark Embree, and **Jeffrey M. Hokanson**
One Can Hear the Composition of a String: Experiments with an Inverse Eigenvalue Problem
SIAM Review, 54 (2012) pp. 157–178
DOI:10.1137/080731037

Refereed Conference Proceedings

1. Paul G. Constantine, **Jeffrey M. Hokanson**, and Drew P. Kouri
Ridge Approximation and Dimension Reduction for an Acoustic Scattering Model
2018 International Applied Computational Electromagnetics Society (ACES) Symposium Denver, CO
DOI:10.23919/ROPACES.2018.8364321

Submitted Manuscripts

5. **Jeffrey M. Hokanson** and Paul G. Constantine
The Lipschitz Matrix: A Tool for Parameter Space Dimension Reduction
arXiv:1906.00105

4. **Jeffrey M. Hokanson** and Caleb C. Magruder
$\mathcal{H}_2$-Optimal Model Order Reduction Using Projected Nonlinear Least Squares
arXiv:1811.11962

3. **Jeffrey M. Hokanson** and Caleb C. Magruder
Least Squares Rational Approximation
arXiv:1811.12590

2. Richard W. Fenrich, Victorien Menier, Philip Avery, Juan J. Alonso, **Jeffrey M. Hokanson**, and Paul Constantine
Reliability-Based Design Optimization of a Supersonic Nozzle

1. **Jeffrey M. Hokanson**
A Data-Driven McMillan Degree Lower Bound
arXiv:1803.00043

Course Notes

1. Steven J. Cox, Mark Embree, **Jeffrey M. Hokanson**
CAAM335 Matrix Analysis: Physical Laboratory
available at: `http://www.caam.rice.edu/caam335lab`

Invited Talks

7. *Exploiting Low-Dimensional Structure in Optimization Under Uncertainty*
Tufts University, 2018

6. *Exploiting Low-Dimensional Structure in Optimization Under Uncertainty*
University of Colorado Denver, 2018

5. *Exploiting Ridge Structure in Chance-Constrained Design Under Uncertainty*
Stanford University, 2017

4. *Exploiting Ridge Structure in Chance-Constrained Design Under Uncertainty*
Sandia National Labs, 2017

3. *Using Projected Nonlinear Least Squares to Measure Eigenvalues*
Tufts University, 2017

2. *Trading Statistical Efficiency for Speed in Parameter Estimation Problems*
Virginia Tech, 2015

1. *Fast Automatic System Identification Using Optimization*
Katholieke Universiteit Leuven, 2010

Conference Presentations

10. *Exploiting Ridge Structure in Chance-Constrained Optimization Under Uncertainty*
SIAM CSE19, Spokane, WA, 2019

9. *Exploiting Ridge Structure in Bayesian Inference*
SIAM UQ18, Orange County, CA, 2018

8. *Data-driven Polynomial Ridge Approximation Using Variable Projection*
15th Copper Mountain Conference on Iterative Methods, Copper Mountain, CO, 2018

7. *Active Subspace or Ridge Approximation?*
International Conference for High Performance Computing, Networking, Storage and Analysis (SC17), Denver, CO, 2017

6. *Data-driven Polynomial Ridge Approximation Using Variable Projection*
3rd Annual Meeting of SIAM Central States Section, Fort Collins, CO, 2017

5. *Projected Nonlinear Least Squares for Impulse Response System Identification*
3rd Annual Meeting of SIAM Central States Section, Fort Collins, CO, 2017

4. *Fast Data-Driven System Identification from Impulse Response Measurements*
SIAM Conference on Computational Science and Engineering, Atlanta, GA, 2017

3. *Fast Minimum Uncertainty Estimates for the Exponential Fitting Problem*
SIAM Annual Meeting, Boston, MA, 2016

2. *CLEAN Corrects Variation in Sample Preparation*
CYTO2016, Seattle, WA, 2016

1. *Fast Automatic System Identification Using Optimization*
16th Congress of the International Linear Algebra Society, Pisa, Italy, 2010

Conference Posters

7. *Exploiting Ridge Structure in Chance Constrained Design Under Uncertainty*
SIAM UQ18, Orange County, CA, 2018

6. *Data-driven Polynomial Ridge Approximation Using Variable Projection*
Conference on Data Analysis (CoDA), Santa Fe, NM, 2018

5. *Data-driven Polynomial Ridge Approximation Using Variable Projection*
Statistical Perspectives on Uncertainty Quantification, Atlanta, GA, 2017

4. *Data-driven Polynomial Ridge Approximation Using Variable Projection*
USACM Workshop on Uncertainty Quantification and Data-Driven Modeling, Austin, TX, 2017

3. *Data-driven Polynomial Ridge Approximation Using Variable Projection*
SIAM Conference on Computational Science and Engineering, Atlanta, GA, 2017

2. *High Dimensional Cytometry Data Visualization Using Parallel Coordinates*
CYTO2016, Seattle, WA, 2016

1. *Speeding Large Nonlinear Least Squares Problems by Near-Optimal Data Compression*
MMDS, Berkeley, CA, 2014

Intramural Presentations

2. *$\mathcal{H}_2$-optimal Model Reduction Using Projected Nonlinear Least Squares*
University of Colorado Boulder, 2018

1. *Exploiting Low-Dimensional Structure in Optimization Under Uncertainty*
University of Colorado Boulder, 2018

Workshops

Model Reduction of Transport-dominated Phenomena
Berlin, Germany, 2015

Gene Golub SIAM Summer School
Selva di Fasano, Italy, 2010

Travel Funding

SIAM Travel Award for DR17 ($650), 2017

USACM Travel Award ($1000), 2017

Shared Resource Lab Travel Award ($1000), 2016

Gene Golub SIAM Summer School Travel Award, 2010

Teaching Experience

CAAM 335 Lab: Matrix Analysis Laboratory, Rice University
Teaching Assistant
Fall 2007, Spring 2008, Fall 2009, Spring 2010

CAAM 336: Differential Equations in Science and Engineering, Rice University
Instructor of Record
Fall 2010, Spring 2012

Mentoring

Ibrohim Nosirov, Science Fair, March 2017-present
placed 2nd in Medical and Health Science, Colorado State Science Fair, 2017

Service

President, Rice University SIAM Student Chapter, May 2008 – May 2009

Referee: • SIAM Journal on Scientific Computing • SIAM/ASA Journal on Uncertainty Quantification • Advances in Computational Mathematics • Operators and Matrices

References

Paul Constantine, University of Colorado at Boulder, `Paul.Constantine@colorado.edu`

Mark Embree, Virginia Tech, `embree@vt.edu`

Serkan Gugercin, Virginia Tech, `gugercin@math.vt.edu`