

# Jeffrey M. Hokanson

Curriculum Vitae · 1 December 2018

Department of Computer Science  
University of Colorado at Boulder  
1111 Engineering Dr  
Boulder, CO 80309

(832) 655-3185  
<http://www.hokanson.us>  
Jeffrey.Hokanson@colorado.edu

## 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)

Advisor: Paul G. Constantine

Postdoctoral Fellow, Colorado School of Mines (October 2016 – September 2017)

Advisor: Paul G. Constantine

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

## 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

## Other Publications

---

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

## Submitted Manuscripts

---

4. **Jeffrey M. Hokanson** and Caleb C. Magruder  
 *$H_2$ -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

## 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

---

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

---

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

## Grants

---

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

## 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

## References

---

Mark Embree, Virginia Tech, [embree@vt.edu](mailto:embree@vt.edu)  
Paul Constantine, University of Colorado at Boulder, [Paul.Constantine@colorado.edu](mailto:Paul.Constantine@colorado.edu)  
Serkan Gugercin, Virginia Tech, [gugercin@math.vt.edu](mailto:gugercin@math.vt.edu)