Rebecca Elizabeth Morrison

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Position

Assistant Professor, Department of Computer Science, University of Colorado Boulder, August 2018 - present

Education

Massachusetts Institute of Technology, Postdoc in Aeronautics and Astronautics, Advisor: Dr. Youssef Marzouk, 02/16 – 07/18

The University of Texas at Austin, Ph.D. in Computational Science, Engineering, and Mathematics, Advisor: Dr. Robert Moser, Dissertation: *On the representation of model inadequacy: A stochastic operator approach*, 01/16

The University of Texas at Austin, M.S. in Computational and Applied Mathematics, 05/12

Scripps College, B.A. in Physics, Advisor: Dr. Adam Landsberg, 05/08

Grants & Awards

NASA Space Weather with Quantified Uncertainties: *Ensemble Learning for Accurate and Reliable Uncertainty Quantification* (Co-PI), with Dr. Enrico Camporeale (PI), and Drs. Curt de Koning, Eric Adamson, and Thomas Berger (Co-PIs) $2,891,954 (My portion: $469,299), 10/20 – 09/23

Johnson&Johnson Women in STEM2D Award: *Discovering Dynamic Structure from Data* (PI), $150,000, 08/19 – 07/22

Association for Women in Mathematics/NSF Travel Grant, $600, 2017

Best Student Paper Award of the World Congress on Engineering and Computer Science 2011

Computational and Applied Mathematics Fellowship, UT Austin, 09/09 – 08/13

Publications

7. R. E. Morrison. *Data-driven corrections of partial Lotka-Volterra models.* Entropy 2020 (22)11, 1313.

6. R. E. Morrison, A. Cunha. *Embedded discrepancy operators: A case study of Zika modeling.* Chaos: An Interdisciplinary Journal of Nonlinear Science, 30(5):051103 (2020).

5. R. E. Morrison, T. A. Oliver, R. D. Moser. *Representing model inadequacy: A stochastic operator approach.* ASA/SIAM Journal on Uncertainty Quantification 6 (2), 457-496 (2018).

4. R. E. Morrison, R. Baptista, Y. Marzouk. *Beyond normality: Learning sparse probabilistic models in the non-Gaussian setting.* Advances in Neural Information Processing Systems 30 (NIPS 2017), 11 pages. (Acceptance rate: 21%)

3. R. E. Morrison, C. M. Bryant, G. Terejanu, S. Prudhomme, K. Miki. *Data partition methodology for validation of predictive models.* Computers and Mathematics with Applications, 66 (10), 2114-2125 (2013).

2. R. E. Morrison, C. M. Bryant, G. Terejanu, K. Miki, S. Prudhomme. *Optimal data split methodology for model validation.* Proceedings of the World Congress on Engineering and Computer Science 2011, p1038-1043. (Acceptance rate: 53%)

1. R. E. Morrison, A. S. Landsberg, E. J. Friedman. *Combinatorial games with a pass: A geometric approach.* Chaos 21, 043108 (2011).

Preprints

R. Baptista, R. E. Morrison, O. Zahm, Y. Marzouk. *Learning non-Gaussian graphical models via Hessian scores and triangular transport.*
arxiv.org/abs/2101.03093

R. E. Morrison. *Exact dimension reduction of the generalized Lotka-Volterra equations.*
arxiv.org/abs/1909.13837

Selected Talks

"Representing model error in SEIR-type models: A case study of the 2016 Zika outbreak in Brazil" Computing Research Association 2020 Virtual Conference Lightning Talk

"Learning sparse non-Gaussian graphical models" Argonne National Laboratory, May 2020

"Representing model inadequacy in reduced models of interacting systems" Workshop on Statistical Perspectives on Uncertainty Quantification, SAMSI, May 2019

"Beyond normality: Learning sparse probabilistic graphical models in the non-Gaussian setting" *Talks Seminar, Institute for Computational Mathematics and Engineering, Stanford, May 2017

Courses Taught

CSCI 7000: Validation and Uncertainty Quantification for Computational Models (Fall 2018, Spring 2020)

CSCI 5822: Probabilistic Models of Human and Machine Intelligence (Spring 2021)

CSCI 4802/5802: Data Science Team (Fall 2020, Spring 2021)

CSCI 2820: Linear Algebra with Computer Science Applications (Spring 2019, Fall 2019)

Faculty Sponsor for UPSCALE (Uncertainty, Probability, Scientific Computing And LEearning) Reading Group (Fall 2019 – present)

Professional Service

Secretary for SIAM UQ Activity Group, 1/21 – 12/22

Reviewed articles for:
Advances in Neural Information Processing Systems (NeurIPS), Chaos, Computer Methods in Applied Mechanics and Engineering, Discrete Applied Mathematics, IEEE/ACM Transactions on Networking, International Conference on Machine Learning, Nature Computational Science, Nonlinear Dynamics, Pattern Recognition Letters, SIAM/ASA Journal on Uncertainty Quantification

Organizer for the Workshop Celebrating Diversity (SIAM), 03/19 and 07/20

Reviewer for NCWIT 2020, 2021 Aspirations in Computing awards

Mentor at Rocky Mountain Celebration of Women in Computing, 11/18

Volunteer Tutor for 8th grade math, with Austin Partners in Education (APIE)
11/13 - 12/14

University Service

Faculty Mentor for the BOLD Center RedShirt S-STEM Program, 10/19 – present

CS Graduate Curriculum Committee member, 01/20 – present

CS Undergraduate Curriculum Committee member, 08/18 – 12/19

Reviewer for Johnson&Johnson WiSTEM2D 2020 and 2021 awards (internal CU Boulder review)

School of Computing Task Force member, Spring 2019

Membership

Society for Industrial and Applied Mathematics (SIAM)

Association for Women in Mathematics (AWM)