# 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, 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

11. M. Tosin, E. Dantas, A. Cunha, R. E. Morrison. *ARBO: Arbovirus Modeling and Uncertainty Quantification Toolbox* (Submitted)

10. R. E. Morrison, R. Baptista, E. Basor. *Diagonal nonlinear transformations preserve structure in covariance and precision matrices.* (In review)
    arxiv.org/abs/2107.04136

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

8. R. E. Morrison. *Exact reduction of the generalized Lotka-Volterra equations via integral and algebraic substitutions.* Computation 2021 (9)5, 49.

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).

## Selected Talks

Caltech CMX (Computational Mathematics + X) Seminar, 12/9/20

Potsdam Institute for Climate Impact Research, Workshop on Uncertainties in Data Analysis (Keynote), 10/1/20

Computing Research Association 2020 Virtual Conference Lightning Talk

Argonne National Laboratory LANS (Laboratory for Applied Mathematics, Numerical Software, and Statistics) Seminar, 05/20/20

SAMSI Workshop on Statistical Perspectives on Uncertainty Quantification, 05/17/19

Stanford, Institute for Computational Mathematics and Engineering, *Talks Seminar, 05/1/17

## Courses Taught

CSCI 4830/7000: The Writing of Science (Graduate Writing Workshop) (Fall 2021)

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 LEarning) 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, Entropy, Games of No Chance, IEEE/ACM Transactions on Networking, International Conference on Machine Learning (ICML), Nature Computational Science, Nonlinear Dynamics, Pattern Recognition Letters, Physica D, 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

Representative for the CS Junior Faculty Assembly, 10/21 – present

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

ECEE Faculty Search Committee member, AY20–21

CS Graduate Curriculum Committee member, 01/20 – 10/21

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)

United States Association for Computational Mechanics (USACM)