

CURRICULUM VITAE: SPENCER LUNDERMAN

Ph.D. Candidate
Department of Mathematics
University of Arizona

Tel.: 512-627-1064
Lunderman@math.arizona.edu
13931 Bessemer Street # 11
Van Nuys, CA. 91401

Experience

Visiting Researcher	NASA's Jet Propulsion Laboratory	Fall 2019 – Spring 2020
NSF funded Research Assistant	Dept. of Mathematics, University of Arizona	2017–Fall 2019
NSF Mathematical Sciences Graduate Internship	National Renewable Energy Laboratory	Summer 2017
Graduate Teaching Assistant	Dept. of Mathematics, University of Arizona	2015–2017

Education

University of Arizona	Mathematics	Ph.D.	2015- present
University of Texas, Arlington	Mathematics	M.Sc.	2015
University of Texas, San Antonio	Mathematics	B.Sc.	2013

Publications

Lunderman, S., Morzfeld, M., Glassmeier, F., Feingold, G.: Estimating parameters of the nonlinear cloud and rain equation from large-eddy simulations. (Physica D: Nonlinear Phenomena; Under review)

van Lier-Walqui, M., Morrison, H., Kumjian, M., Reimel, K., Prat, P., Lunderman, S., Morzfeld, M.: A Bayesian approach for statistical-physical bulk parameterization of rain microphysics, Part II: Idealized Markov chain Monte Carlo experiments. (Journal of the Atmospheric Sciences; Accepted)

Lunderman S., Fioroni, G., McCormick, R., Nimlos, M., Rahimi, M., Grout, R.: Screening Fuels for Autoignition with Small-Volume Experiments and Gaussian Process Classification. American Chemical Society Energy & Fuels, 32 (9), 9581-9591, 2018.

Morzfeld, M., Adams, J., Lunderman, S., and Orozco, R.: Feature-based data assimilation in geophysics, Nonlin. Processes Geophys., 25, 355-374, 2018.

Conference presentations

SIAM Conference on Uncertainty quantification
Co-Organizer of the mini-symposium "Bayesian Inference in Earth Science (Parts I and II)" 2020

American Geophysical Union, General Assembly
Simultaneous parameter and state estimation by derivative-free optimization of ensemble Kalman filter residuals 2019

SIAM Conference on Applications of Dynamical Systems
Feature-Based Data Assimilation Example: Estimating Parameters of the Nonlinear Cloud and Rain Equation from Large-Eddy Simulations. 2019

SIAM Conference on Computational Sciences and Engineering
Using Large-eddy Simulations and Feature-based Data Assimilation to Estimate Environmental Variables of Simplified Cloud and Rain Models. 2019

American Geophysical Union, General Assembly
Bayesian estimation of the nonlinear cloud and rain equation parameters: finding physically relevant model parameters from large-eddy simulations. 2018

SIAM Conference on Mathematics of Planet Earth
An introduction to feature-based data assimilation. 2018

SIAM Conference on Uncertainty quantification
Why and how feature-based data assimilation can be useful. 2018

American Geophysical Union, General Assembly

More data is not always better: Why and how feature-based data assimilation can be useful. 2017

National Renewable Energy Laboratory Summer Poster Session

Gaussian Process Kernel Search Applied to Fuel RON and S Prediction 2017

Awards

American Geophysical Union Outstanding Student Presentation Award (2018)

College of Science Galileo Circle Scholarship (2018)

College of Science Graduate Student Teaching Award (2017)

Graduate Professional Student Council Travel Grant (2017)

Interdisciplinary Research Projects

Below is a list of research projects I lead during my Ph.D.

- Design and implementation of a Global Bayesian optimization framework for derivative free optimization of Data Assimilation algorithms.

Collaborators: Matthias Morzfeld, University of Arizona; Derek Posselt, NASA JPL.

- Bayesian estimation of the nonlinear cloud and rain equation parameters using feature-based data assimilation methods.

Collaborators: Matthias Morzfeld, University of Arizona; Franziska Glassmeier, Wageningen University / NOAA Earth System Research Laboratory; Graham Feingold, NOAA Earth System Research Laboratory.

- Design and implement a Markov Chain Monte Carlo (MCMC) based model selection algorithm for statistical-physical bulk parameterization of rain microphysics.

Collaborators: Marcus van Lier-Walqui, Columbia University / NASA GISS; Hugh Morrison, NCAR; Matthias Morzfeld, University of Arizona.

- Using Gaussian processes with a kernel searching algorithm to screen automobile fuels from small-volume experiments.

Collaborators: Ray Grout, Gina Fioroni, Robert McCormick, Mohammad Rahimi; National Renewable Energy Laboratory.