# Scott Koermer

Contact Information	917 Capulin Rd Los Alamos, NM 87544	E-mail: skoermer@lanl.gov skoermervt@gmail.com Cell Phone: +1 (908)-698-1384
Key Words	Applied Statistics, Bayesian Inference, Uncertaint Engineering Statistics, Simulator Calibration, Phys	y Quantification, Gaussian Process Regression, ical Systems Modeling, Active Learning
Research Interests	Development of novel statistical methods and code the nuance of applied problems. Includes Bayesian simulator emulation with Gaussian Processes tied t accuracy, decrease computation time, reduce comp over the current state of the art.	e as required to meet the demands and cater to inference, inverse problems, decision theory, and o active learning. I look for ways to boost model plexity, and improve ease of use to the end user
Education	PhD Virginia Polytechnic Institute and Stat Mining and Minerals Engineering, Focus in Process Dissertation: <i>Bayesian Methods for Mineral Process</i> Coursework includes surrogate modeling, advanced	e University, May 2022 s Engineering, Advised by Aaron Noble sing Operations Bayesian methods, and data analytics.
	<b>M.S. Virginia Polytechnic Institute and Stat</b> Mining and Minerals Engineering, Focus in Process Thesis: <i>The Application of Mineral Processing Tech</i>	e University, September 2015 s Engineering, Advised by Gerald Luttrell hniques to the Scrap Recycling Industry
	<b>B.S. Virginia Polytechnic Institute and State</b> Mining and Minerals Engineering Minor in Business	e <b>University</b> , May 2014
Professional Positions	<b>Postdoctoral Research Associate</b> Los Alamos National Lab, <i>Statistical Sciences Grow</i>	2022-Present
	• Derived, coded, and tested a novel Bayesian n proved over a previous model by utilizing parti for detecting outlier events under the uncerta tained partial observations. Developed this m ezECM tailoring package functions and docum	nodel for nuclear detonation detection, which im- al training observations. Developed methodology inty imparted by using training data which con- techodology into an open source R package titled entation to improve ease of use in application.
	• Model selection for Bayesian Neural networks, for variational inference of Bayesian Neural n	as well as a comparison of statistical divergences etwork model parameters.
	Graduate Research Assistant Virginia Tech, Mining and Minerals Engineering D	2018-2022 Department
	<ul><li>Research task of modeling and optimization of</li><li>Oversaw undergraduate and young profession</li></ul>	of a hydrometallurgical chemical process. al researchers.
	<b>Production Engineer</b> Schnitzer Steel Recycling Facility, Everett, MA	2015-2018
	<ul><li>Initiated collaborative work between research gate the economic and environmental impact</li><li>Managed a sampling technician and union work</li></ul>	a, administrative, and operations staff to investi- of process changes. orkers. Oversaw plant budgets.
	Graduate Research Assistant Virginia Tech, Mining and Minerals Engineering D	2014-2015 Department
	• Applied advanced mineral processing techniq cedures for lock-cycle testing and release anal	ues to scrap metal recycling, including new pro- ysis.

Honors and Awards	1 <sup>st</sup> place prize for Optimization of a Metallurgical Process with Uncertain Dynamics Society for Mining, Metallurgy & Exploration Mineral Processing Division Graduate Short Video Contest	2021
	<b>3<sup>rd</sup> place prize</b> for <i>Rare Earth Element SX Systems: "Are we at steady state yet?"</i> Society for Mining, Metallurgy & Exploration	
	Mineral Processing Division Graduate Poster Contest	2020
	WAAIME scholarship	2020
Peer Reviewed Journal Articles	Koermer, S., Williams, B., and Carmichael, J. (2024b). Bayesian event categorization matrix approach for nuclear detonations ( <i>In Preparation</i> ). Submitting to Geophysics Journal International. https://arxiv.org/abs/2409.18227	
	Koermer, S., Loda, J., Noble, A., and Gramacy, R. B. (2024a). Augmenting a simulation can for hybrid computer model and field data experiments. <i>Technometrics</i> , (just-accepted):1–20	npaign

Koermer, S. and Noble, A. (2023). Estimation of process steady state with autoregressive models and bayesian inference. *Minerals Engineering*, 191:107965

Koermer, S. and Noble, A. (2021). The utility of Bayesian data reconciliation for separations. *Minerals Engineering*, 169:106837

OPEN SOURCEKoermer, S. (2024). ezECM: Event Categorization Matrix Classification for Nuclear Detonations.SOFTWAREhttps://CRAN.R-project.org/package=ezECM, R package version 1.0.0

Koermer, S. (2022). BayesMassBal: Bayesian Data Reconciliation of Separation Processes. https://CRAN.R-project.org/package=BayesMassBal, R package version 1.1.0

THESIS &PhD Dissertation, Virginia Tech Mining and Minerals EngineeringDISSERTATIONBayesian Methods for Mineral Processing OperationsSpring 2022Topics include:Spring 2022

- Integrated Mean Squared Prediction Error sequential design of experiments for acquisition of simulator data to improve prediction accuracy of a real process modeled utilizing the Kennedy and O'Hagan calibration framework.
- Bayesian data reconciliation of separation processes.
- Use of Bayesian autoregressive models for estimation of process steady state conditions.
- Active learning optimization of a process with unknown dynamics.

Masters Thesis, Virginia Tech Mining and Minerals EngineeringThe Application of Mineral Processing Techniques to the Scrap Recycling Industry2015

• Illustrated that data analysis techniques in mineral processing can be generalized to other settings, particularly recycling.

Media Coverage

- Featured in *Mining Engineering Magazine* article: Academia poised to maintain high standards while continuing the evolution of teaching in a pandemic era on teaching and innovation for the virtual classroom during the pandemic. 2020
  - Wrote *Recycling Today* Magazine article *Gauging Yield and Recovery* with the purpose of educating the recycling industry on process engineering calculations. 2015
- TEACHING Instructor of Record MINE 3544 Mineral Processing Lab, Virginia Tech. Instructor of record for one credit laboratory class providing students with a hands on opportunity for data collection and analysis. The laboratory exercises were adapted to pandemic restrictions via a series of YouTube videos. Final project data unique to each group was generated from the predictive distribution of a Bayesian linear model search conditioned on data obtained by students in previous years. Spring 2020 and 2021.

PROFESSIONALAmerican Statistical Association (ASA)MEMBERSHIPSociety for Industrial and Applied Mathematics (SIAM)

#### Professional Service

Reviewer for <i>Technometrics</i> Journal	2024 - Present
Organized the Chemical Processing Modeling, Simulation, and Machine Learning su Society for Mining, Metallurgy, & Exploration Annual Meeting, Salt Lake, UT	bsession at the February 2022
Reviewer for Minerals Engineering Journal	2021 - Present
Virginia Tech Graduate Honor System Review Panel	2020 - 2022
Virginia Tech Mining and Minerals Engineering Department Diversity Council	Fall 2020
Graduate Student Assembly Departmental Representative, Virginia Tech	Spring 2018

# **Bayesian Event Matrix Categorization Models**

Date, Location	Meeting	Note
June 2024, Livermore, CA	EVIR Meeting	Presentation
July 2024, Los Alamos, NM	CCS-6 Talking to Ourselves	Presentation

## Active Learning for Augmenting Simulator Data

Date, Location	Meeting	Note
April 2022, Atlanta, GA	SIAM UQ22	Poster
June 2023, Los Alamos, NM	CCS-6 Talking to Ourselves Series	Presentation
February 2024, Trieste, Italy	SIAM UQ24	Presentation
August 2024, Portland, OR	JSM 2024	Presentation

### Bayesian Data Reconciliation for Separations

Date, Location	Meeting	Note
February 2022, Salt Lake, UT	SME Annual Meeting	Presentation
December 2020, Virtual	SME PCMIA	Short Presentation

#### **Gaussian Process Regression for Separations**

Date, Location	Meeting	Note
February 2022, Salt Lake, UT	SME Annual Meeting	Presentation
June 2021, Virtual	SME Mineral Processing Division	Short Presentation

### Estimation of Process Steady State With Bayesian Methods

Date, Location	Meeting	Note
February 2020, Phoenix, AZ	SME Annual Meeting	Poster

### Linear Circuit Analysis in Scrap Metal Recycling

Date, Location	Meeting
April 2015, Vancouver, BC	Institute of Scrap Recycling Industries Annual Meeting
March 2015, Berlin, Germany	International Automobile Recycling Congress

- Brian Williams PhD., Statistical Sciences Group, Los Alamos National Lab brianw@lanl.gov
- Joshua Daniel Carmichael PhD., National Security Earth Science Group, Los Alamos National Lab joshuac@lanl.gov
- Aaron Noble PhD., Department of Mining and Minerals Engineering, Virginia Tech aaron.noble@vt.edu
- Robert Gramacy PhD., Department of Statistics, Virginia Tech rbg@vt.edu

More references available upon request.