

# NICHOLAS GALIOTO

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## EDUCATION

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### University of Michigan, Ann Arbor

PhD and MSE in Aerospace Engineering

Defense date: May 15, 2023

GPA: 3.970/4.0

Ann Arbor, MI

*September 2018 - July 2023*

### Vanderbilt University

BE in Mechanical Engineering

*summa cum laude* (GPA: 3.943/4.0)

Nashville, TN

*August 2014 - May 2018*

## EXPERIENCE

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### University of Michigan, Ann Arbor

*Postdoctoral Research Fellow*

July 2023 - Present

*Ann Arbor, MI*

- Conducts research on system identification of dynamical systems using Bayesian inference/uncertainty quantification resulting in publications/talks
- Formulates and implements statistical learning algorithms that can outperform popular methods under high uncertainty
- Communicates with other researchers how to utilize work in pursuit of their research interests

### Sandia National Laboratories

*R&D Graduate Summer Intern*

May 2022 - August 2022

*Livermore, CA*

- Independently researched the applicability of functional tensor networks and variational inference for scalable Bayesian estimation of dynamical systems
- Implemented tensor-train and sampling algorithms and integrated them with pre-existing code
- Composed a summer-end technical report detailing research findings, conclusions, and future work

### Vanderbilt Aerospace Design Lab

*Simulations Lead*

January 2017 - May 2018

*Nashville, TN*

- Collaborated within a team of 12 to build a rocket capable of target identification for competition in the NASA Student Launch Initiative
- Developed simulations to predict the max acceleration and altitude of the rocket within 1% error
- Authored technical documents and presented technical designs before a panel of NASA engineers

## AWARDS AND HONORS

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Michigan Institute for Computational Discovery & Engineering Fellowship

September 2021

Academic Achievement Award

May 2018

NASA Student Launch Champion

May 2018

## PUBLICATIONS

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Galioto, Nicholas, and Alex Arkady Gorodetsky. “Likelihood-based generalization of Markov parameter estimation and multiple shooting objectives in system identification.” *arXiv preprint arXiv:2212.13902* (2022).

Sharma, Harsh, et al. “Bayesian identification of nonseparable Hamiltonian systems using stochastic dynamic models.” *2022 IEEE 61st Conference on Decision and Control (CDC)*. IEEE, 2022.

Galioto, Nicholas, and Alex Arkady Gorodetsky. “A new objective for identification of partially observed linear time-invariant dynamical systems from input-output data.” *Learning for Dynamics and Control*. PMLR, 2021.

Galioto, Nicholas, and Alex Arkady Gorodetsky. “Bayesian identification of Hamiltonian dynamics from symplectic data.” *2020 59th IEEE Conference on Decision and Control (CDC)*. IEEE, 2020.

Galioto, Nicholas, and Alex Arkady Gorodetsky. “Bayesian system ID: Optimal management of parameter, model, and measurement uncertainty.” *Nonlinear Dynamics*, vol. 102, no. 1, 2020, pp. 241-267.

## CONFERENCE AND WORKSHOP PRESENTATIONS

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“Learning partially observed stochastic dynamical systems.” SIAM Conference on Mathematics of Data Science, 26 Sept. 2022, San Diego, CA. Conference presentation.

“Accounting for model uncertainty in the identification of partially known models.” 8th European Congress on Computational Methods in Applied Sciences and Engineering, 9 June 2022, Oslo, Norway. Conference presentation.

“Bayesian learning of stochastic dynamical models for quantities of interest.” SIAM Conference on Uncertainty Quantification, 15 April, 2022, Atlanta, GA. Conference presentation.

“Enforcing physical phenomena in system identification using Bayesian inference and stochastic models.” Mechanistic Machine Learning and Digital Twins for Computational Science, Engineering & Technology, 29 Sept. 2021, San Diego, CA. Conference presentation.

“Accounting for model errors in probabilistic linear identification of nonlinear PDE systems.” 16th U.S. National Congress on Computational Mechanics, 27 July 2021, Virtual. Conference presentation.

“A new objective function for identification of partially observed LTI dynamical systems from input-output data.” Learning for Dynamics & Control Conference, 8 June 2021, Virtual. Poster presentation.

“Robust Bayesian inference by accounting for model error: with applications to Hamiltonian systems.” SIAM Conference on Computational Science and Engineering, 4 March 2021, Virtual. Conference presentation.

“Bayesian identification of Hamiltonian dynamics from symplectic data.” 59th IEEE Conference on Decision and Control, 14 Dec. 2020, Virtual. Conference presentation.

“Bayesian approaches for data-driven learning of dynamical systems.” 3rd Physics Informed Machine Learning, 13 Jan. 2020, Santa Fe, NM. Poster presentation.

## TEACHING ASSISTANTSHIPS

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### **University of Michigan, Ann Arbor**

*Ann Arbor, MI*

- AEROSP 567: Statistical inference, estimation and learning

Fall 2020, 2021

### **Vanderbilt University**

*Nashville, TN*

- ME 3224: Fluid mechanics
- ME 4267: Aerospace propulsion

Fall 2017

Spring 2018