

John Harlim

PERSONAL DETAILS

Address Department of mathematics
214 McAllister Building
The Pennsylvania State University, University Park
Pennsylvania, USA, 16802

Phone (814) 863-9024

E-Mail jharlim@psu.edu

Website <http://www.personal.psu.edu/jzh13/>

ACADEMIC QUALIFICATIONS

Ph.D. Applied Mathematics & Scientific Computation 2001-2006
University of Maryland, College Park, USA

M.Sc Applied Mathematics 1999-2001
University of Guelph, Canada

S.Si. (B.S.) Mathematics 1994-1998
University of Padjadjaran, Indonesia

PROFESSIONAL EXPERIENCE

Professor of Mathematics & Meteorology 2018-present
The Pennsylvania State University

Associate Director 2014-present
Center for Advanced Data Assimilation and Predictability Techniques
The Pennsylvania State University

Associate Professor of Mathematics & Meteorology 2013-2018
The Pennsylvania State University

Assistant Professor of Mathematics 2009-2013
North Carolina State University

Post-Doctoral Research 2006-2009
New York University
Supervisor: Prof. Andrew J. Majda

ACTIVE GRANTS

National Science Foundation Grant DMS-2229435 2022-2025
AMPS: Compositional Data-Driven Modeling, Prediction and Control for Reconfigurable Renewable Energy Systems (Co-PI)

National Science Foundation Grant DMS-2207328 2022-2025
Data-driven statistical dynamical modeling: Shortage of training data and high-dimensionality (Single PI)

Office of Naval Research Grant N00014-22-1-2193
Solving PDEs with manifold learning algorithms (Single PI)

2022-2025

National Science Foundation Research Grant DMS-1854299

2019-2022

FRG: Collaborative Research: Non-Smooth Geometry, Spectral Theory, and Data: Learning and Representing Projections of Complex Systems

SHORT LIST OF REPRESENTATIVE PUBLICATIONS

Books

1. J. Harlim, *Data-Driven Computational Methods: Operator and Parameter Estimations*, Cambridge University Press, UK, 2018.
2. A.J. Majda and J. Harlim, *Filtering Complex Turbulent Systems*, Cambridge University Press, UK, 2012.

Refereed Journals

1. S.W. Jiang and J. Harlim, *Ghost point diffusion maps for solving elliptic PDEs on manifolds with classical boundary conditions*, Comm. Pure Appl. Math. (in press), preprint available in arXiv:2006.04002.
2. J. Harlim, S.W. Jiang, S. Liang, and H. Yang, *Machine learning for prediction with missing dynamics*, J. Comput. Phys. 428, 109922, 2021.
3. H. Zhang, J. Harlim, and X. Li, *Error Bounds of the Invariant Statistics in Machine Learning of Ergodic Itô Diffusions*, preprint available in arXiv:2105.10102.
4. T. Berry, D. Giannakis, and J. Harlim, *Bridging data science and dynamical systems theory*, Notices of the American Mathematical Society, 67(9), 1336-1349, 2020.
5. T. Berry and J. Harlim, *Variable Bandwidth Diffusion Kernels*, Appl. Comput. Harmon. Anal. 40, 68-96, 2016.

RESEARCH MENTORING

*Postdoctoral Fellows (*first position)*

- Shixiao W. Jiang, 2017 - 2020 (*assistant professor of mathematics at ShanghaiTech University).
- Michèle De La Chevrotière, 2015 - 2017 (*research associate at Environmental Canada).
- Tyrus Berry, 2013 - 2015 (*research associate at George Mason University).
- Emily L. Kang, 2010-2011, (*assistant professor of statistics at U. of Cincinnati).

Ph.D. students

- Wilson Peoples, Mathematics, PSU 2021 - present.
- Qile Yan, Mathematics, PSU 2019 - present.
- Faheem Gilani, Mathematics, PSU 2021 (*PhD student in Economics at UT Austin).
- He Zhang, Mathematics, PSU 2021 (*Posdoct at Beijing International Center for Mathematical Research).
- Kristen A. Bathmann (Brown), Applied Mathematics, NCSU 2014, (*NOAA affiliate, IMSG).

ACTIVE/UPCOMING ACTIVITIES

- Workshop co-organizer at the FoCM conference in Paris, France, from June 12-21, 2023.
- Co-organizer of the PSU-Purdue-UMD Joint Seminar on Mathematical Data Science. See the schedule at: <https://yuangaogao.github.io/seminar.html>.
- Associate editor for Advances in Continuous and Discrete Models, 2021-present.
- Associate editor for SIAM/ASA Journal of Uncertainty Quantification, 2018-present.

Last Updated: September 21, 2022.