Victor Churchill churchill.77@osu.edu https://people.math.osu.edu/churchill.77/ **(207) 216-0251**

Academic Appointments

Trinity College, Hartford, CT — *Starting Jul. 2023*
Assistant Professor
Department of Mathematics

The Ohio State University, Columbus, OH — *Aug. 2020 - Present*
Visiting Assistant Professor of Scientific Computation
Department of Mathematics
Mentor: Dongbin Xiu

Education

Dartmouth College, Hanover, NH — *Sep. 2016 - Jun. 2020*
Ph.D. Mathematics — *Awarded Jun. 2020*
A.M. Mathematics — *Awarded Nov. 2017*
Advisor: Anne Gelb

Courant Institute of Mathematical Sciences, New York University — *Jan. 2015 - May 2016*
M.S. Mathematics — *Awarded May 2016*
Advisor: Michael O'Neil

Boston College, B.A. Mathematics, *magna cum laude*, minor in economics — *Awarded May 2013*

Papers

1. Chen, Z., Churchill, V., Wu, K., and Xiu, D. (2022).
Deep Neural Network Modeling of Unknown Partial Differential Equations in Nodal Space,
Journal of Computational Physics, 449, 110782.
2. Churchill, V. and Gelb, A. (2023).
Estimation and Uncertainty Quantification for Piecewise Smooth Signal Recovery,
Journal of Computational Mathematics, 41(2), 246-262.
3. Churchill, V. and Gelb, A. (2022).
Sampling-based Spotlight SAR Image Reconstruction from Phase History Data for Speckle Reduction and Uncertainty Quantification,
SIAM/ASA Journal of Uncertainty Quantification, 10(3), 1225-1249.
4. Churchill, V., and Gelb, A. (2022).
Sub-Aperture SAR Imaging with Uncertainty Quantification,
Under review at *Inverse Problems*.
5. Churchill, V., Manns, S., and Xiu, D. (2022).
Robust Modeling of Unknown Dynamical Systems via Ensemble Averaged Learning,
Accepted at *Journal of Computational Physics*.
6. Churchill, V., and Xiu, D. (2022).
Deep Learning of Chaotic Systems from Partially-Observed Data,
Journal of Machine Learning for Modeling and Computing, 3(3), 97-119.
7. Churchill, V., and Xiu, D. (2022).
Learning Fine Scale Dynamics from Coarse Observations via Inner Recurrence,
Journal of Machine Learning for Modeling and Computing, 3(3), 61-77.
8. Churchill, V. and Gelb, A. (2019).
Detecting edges from non-uniform Fourier data via sparse Bayesian learning,
Journal of Scientific Computing, 80(2), 762-783.
9. Churchill, V., Archibald, R., and Gelb, A. (2019).
Edge-adaptive ℓ_2 regularization image reconstruction from non-uniform Fourier data.
Inverse Problems and Imaging 13(5), 931-958.
10. Churchill, V. and Gelb, A. (2019).
Edge-masked CT image reconstruction from limited data,
In *15th International Meeting on Fully Three-Dimensional Image Reconstruction in Radiology and Nuclear Medicine* (Vol. 11072), 320-324, SPIE.

In Preparation

1. Churchill, V., Chen, Y., Xu, Z., and Xiu, D. (2022).
Modeling of Partially-Observed PDE Systems,
2. Xu, Z., Churchill, V., Manns, S., and Xiu, D. (2022).
Parameter Estimation for Dynamical Systems using Deep Neural Networks.

Research Presentations

1. SIAM Conference on Computational Science and Engineering — *Mar. 2023*
2. SIAM TX-LA Regional Meeting — *Nov. 2022*
3. SIAM Conference on Mathematics of Data Science — *Sep. 2022*
   Organizer of Mini-Symposium: Data-Driven Methods in Scientific Computing
4. SIAM Annual Meeting — *Jul. 2022*
   Robust Modeling of Unknown Dynamical Systems via Ensemble Averaging
5. Joint Math Meetings (virtual) — *Apr. 2022*
   Deep Neural Network Modeling of Unknown PDEs in Nodal Space
6. SIAM Conference on Uncertainty Quantification — *Mar. 2022*
   Robust Modeling of Unknown Dynamical Systems via Ensemble Averaging
7. AMS Central Section Meeting (virtual) — *Mar. 2022*
   Deep Neural Network Modeling of Unknown PDEs in Nodal Space
8. 16th U.S. National Congress on Computational Mechanics (virtual) — *Jul. 2021*
   Learning Coarse-Grained Dynamics from High Fidelity Models
9. SIAM Annual Meeting (virtual) — *Jul. 2021*
   Deep Neural Network Modeling of Unknown PDEs in Nodal Space
10. SIAM Conference on Imaging Science (virtual) — *Jul. 2020*
    Binary weighting for sparsity regularization
11. AFOSR Contractor Review — *January 2020*
    High order total variation Bayesian learning via synthesis
12. The Ohio State University Computational Mathematics Seminar — *December 2019*
    High order total variation Bayesian learning via synthesis
13. SIAM PNW Regional Meeting — *October 2019*
    Image reconstruction via masked regularization
14. Dartmouth Applied and Computational Math Seminar — *October 2019*
    Identifying damage in sea ice from sparse laser strain measurements
15. SIAM SEAS Regional Meeting — *September 2019*
    Image reconstruction via masked regularization
16. Dartmouth Applied and Computational Math Seminar — *May 2019*
    Total variation Bayesian learning via synthesis
17. New England Numerical Analysis Days — *April 2019*
    Image reconstruction via masked regularization
18. ATR Center Summer Review — *August 2018*
    Sparsity-based Interferometric Synthetic Aperture Radar
19. SIAM Conference on Imaging Science — *June 2018*
    Edge-Adaptive ℓ_2 Regularization Image Reconstruction

Coding

Python (including Keras and Tensorflow), MATLAB

Lab/Industry Work

2019	Summer Researcher, US Army Cold Regions Research and Engineering Lab, Hanover, NH
2018	Summer Researcher, ATR Center at Wright State Univ. / Air Force Research Lab, Dayton, OH
2014-2015	Program Manager, Code Systems Corporation (Software Startup), Seattle, WA

Awards

- Neukom Prize for Outstanding Graduate Research in Computational Science - 3rd Prize — *2020*
- Neukom Prize for Outstanding Graduate Research in Computational Science - 2nd Prize — *2019*
- Pi Mu Epsilon National Mathematics Honor Society — *2013*
- National Security Education Program David L. Boren Scholarship — *2011-2012*

Teaching Experience

The Ohio State University, Columbus, OH *Autumn 2020 - Present*
Instructor
Designed syllabi and delivered lectures, held office hours, wrote and graded homework and exams. Fully responsible for all course content and material.

- Math 3607 – Beginning Scientific Computing (Undergraduate) *Springs 2021, 2022*
- Math 5603 – Numerical Linear Algebra (Graduate) *Autumns 2020, 2021, 2022*
- Math 6193 – Computational Math Headstart (Entering PhD Students) *Summers 2021, 2022*

Dartmouth College, Hanover, NH *September 2019 - June 2020*
Instructor
Designed syllabi and delivered lectures, held office hours, wrote and graded homework and exams. Fully responsible for all course content and material.

- Math 8 – Calculus of Functions of One and Several Variables *Spring 2020*
- Math 23 – Differential Equations *Fall 2019*

Teaching/Research Assistant *Sep. 2016 - Aug. 2019*
Held homework help sessions three times a week. Wrote and graded homework, held coding tutorials, and assisted students with individual research projects.

- Math 22 – Linear Algebra *Spring 2018*
- Dartmouth Mathematics REU *Summer 2017*
- Math 76 – Topics in Applied Math *Summer 2017*
- Math 20 – Probability *Spring 2017*
- Math 23 – Differential Equations *Fall 2016*

Courant Institute, NYU, New York, NY *Sep. 2015 - May 2016*
Recitation Leader
Instructed students in twice weekly mandatory review sessions, wrote and graded quizzes.

- Algebra and Calculus *Fall 2015, Spring 2016*

Posters

Jun. 2019 15th International Meeting on Fully Three-Dimensional Image Reconstruction in Radiology and Nuclear Medicine
Edge-masked CT image reconstruction from limited data

Apr. 2019 Graduate Student Poster Session - Dartmouth College
Image reconstruction enhancement via masked regularization

Mar. 2019 Computational Imaging - ICERM
Image reconstruction enhancement via masked regularization

Oct. 2018 Celebrating Biomedical Research at Dartmouth College
Parameter-free Bayesian Total Variation Medical Image Denoising

Aug 2018 ATR Center Summer Review
Sparsity-based 3D Interferometric Synthetic Aperture Radar

Apr. 2018 Graduate Student Poster Session - Dartmouth College
Edge-Adaptive ℓ_2 Regularization Image Reconstruction

Jan. 2018 Annual Review of EM Contractors - Air Force Office of Scientific Research
Edge-Adaptive ℓ_2 Regularization Image Reconstruction from Vehicle SAR Data

Affiliations

2018-2020 Vice President, Dartmouth SIAM Chapter
2017-2020 Department Representative, Dartmouth Graduate Student Council
2016- Member, SIAM

Professional Service

Peer Reviewer for: Journal of Machine Learning for Modeling and Computing, Foundations of Data Science, Inverse Problems, Journal of Computational Physics, Journal of Scientific Computing, IEEE Transactions on Signal Processing, Inverse Problems and Imaging

Professional Development

Fall 2019 Academic Job Search Workshop Series (10 sessions)
Dartmouth Center for the Advancement of Learning

Winter 2019 Future Faculty Teaching Workshop Series (6 sessions)
Dartmouth Center for the Advancement of Learning