James Matuk

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Education

Ph.D. Statistics, The Ohio State University, Columbus, OH   Aug. 2016 - Aug. 2021
  Advisors: Oksana Chkrebtii and Sebastian Kurtek
  Dissertation: Bayesian Frameworks for Simultaneous Estimation, Registration, and Inference for Functions and Planar Curves

M.S. Statistics, The Ohio State University, Columbus, OH   Aug. 2016 - Dec. 2018

B.S. Mathematics, Duquesne University, Pittsburgh, PA   Aug. 2012 - May 2016
  Honors: *summa cum laude*

Academic Experience

Duke University, Durham, NC

Postdoctoral Associate   Aug. 2021 - Present
  Advisors: David Dunson and Amy Herring
Data+ Project Manager   May 2022 - Jul. 2022

The Ohio State University, Columbus, OH

Graduate Research Associate, Department of Statistics   Jan. 2018 - Aug. 2021
Graduate Teaching Associate, Department of Statistics   Aug. 2017 - May 2020

  - Recitation leader for STAT 4201: *Introduction to Mathematical Statistics* (Autumn 2017, 140 students)
  - Instructor for STAT 3303: *Bayesian Analysis and Statistical Decision Making* (Spring 2020, 50 Students students)

Consultant, Department of Statistics, Statistical Consulting Service Aug. 2018 - Dec. 2018
University Fellow, Department of Statistics   Aug. 2016 - Aug. 2017

Duquesne University, Pittsburgh, PA

Undergraduate Research Assistant, Department of Mathematics   Jan. 2015 - May 2016

Publications

Peer-Reviewed Publications

6. **Matuk, J.**, and Guo, X. *Shape-Restricted Estimation and Spatial Clustering of COVID-19 Infection Rate Curves*, Spatial Statistics, 2022.

5. **Matuk, J.**, Bharath, K., Chkrebtii, O., and Kurtek, S. *Bayesian Framework for Simultaneous Registration and Estimation of Noisy, Sparse and Fragmented Functional Data*, Journal of the American Statistical Association, 2021.

4. **Matuk, J.**, Bharath, K., Chkrebtii, O., and Kurtek, S. *Geometric Empirical Bayesian Model for Classification of Functional Data under Diverse Sampling Regimes*, IEEE/CVF Conference of Computer Vision and Pattern Recognition Workshops, 2021.

3. **Matuk, J.**, Herbei, R., and Kurtek, S. *Bayesian Registration of Functions*, Wiley StatsRef, 2021.

2. **Matuk, J.**, Chkrebtii, O., and Niezgoda, S. *Bayesian Inference for Polycrystalline Materials*, Stat, 2020.

1. **Matuk, J.**, Chkrebtii, O., and Kurtek, S. *Estimation of Sparsely Observed Signals with an Empirical Bayesian Model*, Conference proceedings of the Asilomar Conference on Signals, Systems, and Computers, 2019.

Book Chapters

1. **Matuk, J.**, Mohammed, S., Kurtek, S., and Bharath, K. *Biomedical Applications of Geometric Functional Data Analysis.* In Grohs, P., Holler, M., and Weinmann, A. (editors), *Handbook of Variational Methods for Nonlinear Geometric Data*, Springer, 2019.

Pre-Prints

2. **Matuk, J.**, Herring, A. H., and Dunson, D. B. *Bayesian Functional Principal Component Analysis using Relaxed Mutually Orthogonal Processes*, arxiv.org:2205.12361, 2022+.

1. **Matuk, J.**, Kurtek, S., and Bharath, K. *Topological Data Analysis through Aligment of Persistence Landscapes*, arXiv:2106.15436, 2021+.

Awards

8. *Craig Cooley Memorial Prize*, Department of Statistics, The Ohio State University, Apr. 2021.

7. *Student & Early Career Funding Award*, Symposium on Data Science and Statistics, Jun. 2020.

6. *Hannan Graduate Student Travel Award*, Institute of Mathematical Statistics, Apr. 2020.

5. *Third Place Prize for Best Oral Presentation in Mathematical & Physical Sciences* for the presentation *Bayesian Framework for Simultaneous Registration and Estimation of Noisy, Sparse and Fragmented Functional Data* at the Edward F. Hayes Graduate Research Forum, The Ohio State University, Mar. 2020.

4. *2020 ASA Statistics in Imaging Student Paper Competition Runner-up Award* for the paper *Bayesian Framework for Simultaneous Registration and Estimation of Noisy, Sparse and Fragmented Functional Data*, Jan. 2020.

3. *Student Paper Contest Finalist* for the paper *Estimation of Sparsely Observed Signals with an Empirical Bayesian Model* at the Asilomar Conference on Signals, Systems, and Computers, Nov. 2019.

2. *Award for Outstanding Research Associate*, Department of Statistics, The Ohio State University, Apr. 2018.

1. *Chuck Loch Memorial Award for Excellence in Mathematics*, Department of Mathematics, Duquesne University, Apr. 2016.

Presentations

Talks

13. *Bayesian Functional Principal Component Analysis using Relaxed Mutually Orthogonal Processes*,

    - International Society of Bayesian Analysis World Meeting, Montreal, CA, Jul. 2022.
    - Joint Statistical Meeting, Washington D.C., Aug. 2022.

12. *Topological Data Analysis through Alignment of Persistence Landscapes*. Geometry and Topology meet Data Analysis and Machine Learning (virtual), Jul. 2021.

11. *Bayesian Framework for Simultaneous Registration and Estimation of Noisy, Sparse and Fragmented Functional Data*,

    - Eastern North American Region of the International Biometric Society Spring Meeting (virtual), Mar. 2021.
    - Joint Statistical Meetings (virtual), Aug. 2020.
    - Edward F. Hayes Graduate Research Forum, The Ohio State University, Mar. 2020.

10. *Shape Based Classification of Curves*, Invited Talk, Duquesne University (virtual), Mar. 2021.

9. *A Bayesian Model for Incomplete Closed Curves*, The Ohio State University's Statistics Department Student Seminar (virtual), Oct. 2020.

8. *Bayesian Inference for Polycrystalline Materials*, Symposium on Data Science and Statistics (virtual), Jun. 2020.

7. *Functional and Shape Data Analysis*, Invited Talk, Duquesne University, Mar. 2019.

6. *Bayesian Inference for Material Texture*, Electron Backscatter Diffraction Topical Conference, University of Michigan, May 2018.

5. *Bayesian Calibration of Inexact Computer Models*, Research Group in Design of Physical and Computer Experiments, The Ohio State University, Mar. 2018.

4. *The Curvature Noise Distribution and Applications*,

   - Joint Mathematics Meetings in Seattle, WA, Jan. 2016.
   - Bowling Green State University, Nov. 2015.

3. *Curvature Noise vs. Image Noise*, Mathematical Association of America Mathfest, Washington D.C., Aug. 2015.

2. *A Non-local approach for Denoising Image Data*, Mathematical Association of America regional meeting, Washington and Jefferson College, Apr. 2015.

1. *A Study of the Buades, Coll, and Morel Non-local Means Algorithm*, Pi Mu Epsilon regional meeting, Youngstown State University, Mar. 2015.

Posters

7. *Geometric empirical Bayesian model for classification of functional data under diverse sampling regimes*, 6th IEEE CVPR International Workshop on Differentual Geometry in Computer Vision and Machine Learning (virtual), Jun. 2021.

6. *Shape-Restricted Estimation and Clustering for COVID-19 Infection Rate Curves*, Center for Clinical and Translational Science Annual Meeting (virtual), The Ohio State University, Jan. 2021.

5. *Estimation of Sparsely Observed Signals with an Empirical Bayesian Model*

   - Center for Clinical and Translational Science Annual Meeting, The Ohio State University, Dec. 2019.
   - Asilomar Conference on Signals, Systems, and Computers, Nov. 2019.
   - International Conference on Statistical Distributions and Applications, Grand Rapids, MI, Nov. 2019.

4. *Function Estimation Through Phase and Amplitude Separation*, Joint Statistical Meetings, Denver, CO, Aug. 2019.

3. *Functional Principal Component Analysis of Phase and Amplitude Variability*, Statistics and Biostatistics Graduate Student Poster Session, The Ohio State University, Sep. 2017.

2. *Curvature Noise vs. Image Noise*, Summer Undergraduate Research Program, Duquesne University, Jul. 2015.

1. *A Non-Local Approach for Denoising Image Curvature Data*, Duquesne University Undergraduate Research and Scholarship Symposium, Apr. 2015.

Software

Proficient: LaTeX, MATLAB, R
Competent: C++, JMP, Python, SPSS

Editorial Activities

Peer Reviewer
    Annals of Applied Statistics
    Biostatistics
    Journal of Data Science
    Journal of the Royal Statistical Society, Series C

Service Activities

Session Chair
    International Society for Bayesian Analysis 2022 World Meeting
    Session: Recent applications of scalable Bayesian inference using stochastic gradient
           MCMC
American Statistical Association's DataFest at The Ohio State University
    Mentor at Duke University, 2022
    Mentor at The Ohio State University, 2017 & 2018
Duke Datathon
    Mentor, 2021
Statistics and Biostatistics Graduate Student Association at The Ohio State University
    President, 2019-2020 Academic Year
Ohio State Science Fair
    Judge, 2017
Pi Mu Epsilon (U.S. Mathematics Honors Society), Duquesne University Chapter
    President, 2015-2016 Academic Year

Vice President, 2014-2015 Academic Year

Membership

American Statistical Association
    Sections: Bayesian Statistical Science, Statistics in Imaging
Eastern North American Region of the International Biometric Society
Institute of Mathematical Statistics
Society for Industrial and Applied Mathematics