Matthew D. Koslovsky, PhD

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RESEARCH INTERESTS

Theory and Methods: Bayesian modeling, variable selection, graphical models, nonparametric Bayes, statistical computing, multistate Markov models, R package development, varying-coefficient models, hidden Markov models, variational inference

Application: cancer prevention, smoking behaviors, mental health, addiction, physical activity, nutrition, microbiome, mHealth, ecological momentary assessment, intensive longitudinal data, environmental health, human health and performance in space

EDUCATION

The University of Texas Health Science Center, Houston, TX
Doctor of Philosophy, Biostatistics, GPA: 4.0/4.0 — Dec 2016
· Minor: Health Promotions and Behavioral Sciences
· Title: Deterministic Bayesian variable selection developments for binary outcomes
· Advisor: Michael D. Swartz, PhD

The University of Texas, Austin, TX
Bachelor of Science, Mathematics — Aug 2011
· Concentration: Scientific Computation

EXPERIENCE

Colorado State University, Fort Collins, CO
Assistant Professor — Aug 2020 - Current
· Department of Statistics

Rice University, Houston, TX
Adjunct Professor — Aug 2021 - Current
· Department of Statistics

Rice University, Houston, TX
Post-Doctoral Research Associate — March 2018 - July 2020
· NSF/RTG Post-Doctoral Fellowship in Data Science
· Advisor: Marina Vannucci, PhD

KBRwyle, Houston, TX
Biostatistician — July 2016 - March 2018
· Human Health and Performance Contract
· Johnson Space Center

The University of Texas Health Science Center, Houston, TX
Pre-Doctoral Fellow — Jan 2015 - Dec 2016
· National Cancer Institute Pre-Doctoral Fellowship
· Cancer Education and Career Development Program

Pre-Doctoral Trainee — Aug 2013 - Jan 2015
· National Institutes of Health Pre-Doctoral Traineeship

Science Systems and Applications, Inc., Hampton, VA

Summer Intern — May 2014 - Aug 2014
· DEVELOP National Program
· Langley Research Center

National Space Biomedical Research Institute, Houston, TX
Summer Apprentice — May 2013 - Aug 2013
· Biostatistics Laboratory
· Johnson Space Center

Cancer Prevention and Research Institute of Texas, Austin, TX
Summer Intern — May 2010 - Oct 2010
· University of Texas School of Public Health
· Biostatistics Department

TEACHING EXPERIENCE

Colorado State University, Department of Statistics

Data Analysis and Regression (STAT 540)	Fall 2021
Statistical Computing (STAT 600)	Spring 2021
Logistic/Survival Analysis for Epidemiology (STAR 580A1)	Fall 2020
Statistics Seminar Series (STAT 592 & 792)	Fall 2020

UTHealth, Department of Biostatistics and Data Science

Lecturer (Ad Hoc), Foundations of Biostatistics (PH1690)	Fall 2019
· Student evaluation of overall effectiveness - 4.81/5.0	
Lecturer (Ad Hoc), Foundations of Biostatistics (PH1690)	Summer 2019
· Student evaluation of overall effectiveness - 4.86/5.0	
Teaching Assistant, Theory of Biostatistics II (PH1911)	Spring 2016
Teaching Assistant, Linear Models (PH1915)	Fall 2015
Teaching Assistant, Intermediate Biostatistics (PH1700)	Fall 2015
Teaching Assistant, Applied Statistical Analysis I (PH1820)	Summer 2015
Teaching Assistant, Applied Statistical Analysis II (PH1821)	Spring 2013

PUBLICATIONS

Submitted/In Progress

1. Hoskovec, L., **Koslovsky, M.D.**, Koehler, K., Peel, J.L., Volckens, J., and Wilson, A. Infinite Hidden Markov Models for Multiple Multivariate Time Series with Missing Data (Submitted). [**Honorable mention in the ENVR Student Paper Competition for the Joint Statistical Meetings 2021**]
2. Fu, J., **Koslovsky, M.D.**, and Vannucci, M. A Bayesian Joint Model for Mediation Effect Selection in Compositional Microbiome Data. (Submitted).
3. **Koslovsky, M.D.** and Kendzor, D.E. A Bayesian Joint Modeling Approach for Dynamic Functional Variable Selection. (In Progress)
4. Liang, M. , **Koslovsky, M.D.**, and Vannucci, M., An Ewens-Pitman Attraction mixture model for mHealth Data. (In Progress)
5. Yu, Duo, **Koslovsky, M.D.**, and Swartz, M.D., TRIO_RVEMVS: Rare Variant Association Analysis by EMVS with Trio Data. (In Progress)
6. Shaddox, E. , **Koslovsky, M.D.**, and Vannucci, M. A Spiked Dirichlet Process Prior for Joint Network Inference. (In Progress)
7. Hébert, E.T., **Koslovsky, M.D.**, and Businelle, M.S. Time-varying relations for smoking behaviors captured in a novel, smartphone-based just-in-time adaptive intervention. (In Progress)

Statistical Methodology

8. Liang, M.*, **Koslovsky, M.D.***, Hébert, E.T., Kendzor, D.E., Businelle, M.S., and Vannucci, M. (2021+). Bayesian Continuous-Time Hidden Markov Models with Covariate Selection for Intensive Longitudinal Data with Measurement Error. *Psychological Methods*.
* indicates equal contribution

9. **Koslovsky, M.D.** and Vannucci, M. (2021+). Dirichlet-Multinomial Regression Models with Bayesian Variable Selection for Microbiome Data. In S. Datta & S. Guha (Eds.), *Statistical Analysis of Microbiome Data*. Springer Verlag.

10. **Koslovsky, M.D.**, Hébert, E.T., Businelle, M.S., and Vannucci, M. (2020). A Bayesian Time-Varying Effect Model for Behavioral mHealth Data. *Annals of Applied Statistics,* **14(4)**, 1878-1902.

11. **Koslovsky, M.D.** and Vannucci, M. (2020). MicroBVS: Dirichlet-tree multinomial regression models with Bayesian variable selection - an R package. *BMC Bioinformatics*, **21(301)**.

12. **Koslovsky, M.D.**, Hoffman, K., Daniel, C., and Vannucci, M. (2020). A Bayesian model of microbiome data for simultaneous identification of covariate associations and prediction of phenotypic outcomes. *Annals of Applied Statistics*, **14(3)**, 1471-1492. [**Selected for presentation as "The Best of AOAS" at the Joint Statistical Meetings 2021**]

13. **Koslovsky, M.D.**, Swartz, M.D., Chan, W., Leon-Novelo, L., Wilkinson, A.V., Kendzor, D.E., and Businelle, M.S. (2018). Bayesian variable selection for multistate Markov models with interval-censored data in an ecological momentary assessment study of smoking cessation. *Biometrics*, **74(2)**, 636-644.

14. **Koslovsky, M.D.**, Swartz, M.D., Leon-Novelo, L., Chan, W., and Wilkinson, A.V. (2018). Using the EM algorithm for Bayesian variable selection in logistic regression models with related covariates. *Journal of Statistical Computation and Simulation*, **88(3)**, 575-596.

Applications

15. Zwart, S.R., Rice, B.L., Dlouhy, H., Shackelford, L.C., Heer, M., **Koslovsky, M.D.**, and Smith, S.M. (2018). Dietary acid load and bone turnover during long-duration spaceflight and bed rest. *The American Journal of Clinical Nutrition*, **107(5)**, 834-844.

16. Conkin, J., Sanders, R.W., **Koslovsky, M.D.**, Wear, M.L., Kozminski, A.G., and Abercromby, A.F. (2018). A systematic review and meta-analysis of decompression sickness in altitude physiological training. *Aerospace Medicine and Human Performance*, **89(11)**, 941-951.

17. **Koslovsky, M.D.**, Hébert, E.T., Swartz, M.D., Chan, W., Leon-Novelo, L., Wilkinson, A.V., Kendzor, D.E. and Businelle, M.S. (2017). The time-varying relations between risk factors and smoking before and after a quit attempt. *Nicotine and Tobacco Research*, **20(10)**, 1231-1236.

18. Conkin, J., Wessel, J.H., Norcross, J.R., Bekdash, O.S., Abercromby, A.F., **Koslovsky, M.D.**, and Gernhardt, M.L. (2017). Hemoglobin oxygen saturation with mild hypoxia and microgravity. *Aerospace Medicine and Human Performance*, **88(6)**, 527-534.

Proceedings

18. Meyers, J., Garcia, Y., Arellano, J., Boley, L., Goodenow D., Kerstman, E., **Koslovsky, M.D.**, Reyes, D., Saile, L., Taiym, W., and Young, M. (2018, September 16-21). Validation of the NASA Integrated Medical Model: A Space Flight Medical Risk Prediction Tool. Paper presented at *Probabilistic Safety Assessment and Management 14*, Los Angeles, CA.

PRESENTATIONS

- "A Bayesian Model of Microbiome Data for Simultaneous Identification of Covariate Associations and Prediction of Phenotypic Outcomes." **Best of AOAS**, Joint Statistics Meetings, Seattle, WA. Aug 2021. (Invited Talk)
- "A Bayesian Model of Microbiome Data for Simultaneous Identification of Covariate Associations and Prediction of Phenotypic Outcomes.", ISBA, virtual conference. July 2021. (Contributed Talk)
- "A Bayesian Model of Microbiome Data for Simultaneous Identification of Covariate Associations and Prediction of Phenotypic Outcomes." CM-Statistics, virtual conference. Dec 2020. (Invited Talk)
- "A Bayesian Model of Microbiome Data for Simultaneous Identification of Covariate Associations and Prediction of Phenotypic Outcomes." ICSA Applied Statistics Symposium, virtual conference. Dec 2020. (Invited Talk)
- "A Bayesian Model of Microbiome Data for Simultaneous Identification of Covariate Associations and Prediction of Phenotypic Outcomes." BAYSM:O, virtual conference. Nov 2020. (Invited Talk)
- "Bayesian Methods for Behavioral mHealth Data." Colorado State University, Department of Statistics. Feb 2020. (Departmental Seminar)
- "Bayesian Methods for Behavioral mHealth Data." University of Colorado Denver, Department of Biostatistics & Informatics. Feb 2020. (Departmental Seminar)
- "Bayesian Methods for Behavioral mHealth Data." University of Missouri, Department of Statistics. Jan 2020. (Departmental Seminar)
- "Bayesian Methods for Behavioral mHealth Data." Montana State University, Department of Mathematical Sciences. Jan 2020. (Departmental Seminar)
- "A Bayesian Model of Microbiome Data for Simultaneous Identification of Covariate Associations and Prediction of Phenotypic Outcomes." iBright, Houston, TX. Nov 2019. (Contributed Poster Presentation)
- "A Bayesian Model of Microbiome Data for Simultaneous Identification of Covariate Associations and Prediction of Phenotypic Outcomes." Joint Statitsics Meetings, Denver, CO. Aug 2019. (Contributed Poster Presentation)
- "A Bayesian Model of Microbiome Data for Simultaneous Identification of Covariate Associations and Prediction of Phenotypic Outcomes." BigDIA, Houston, TX. Dec 2018. (Contributed Poster Presentation)
- "CommClust: A network-based algorithm for clustering multivariate repeated measures data." NASA Human Research Program Investigators' Workshop. Galveston, TX. Jan 2018. (Contributed Poster Presentation)
- "Immersive Data Analysis for NASA Biomedical Data," Rice Data Science Conference, Houston, TX, Oct 2017. (contributed oral presentation)

- "Immersive Data Analysis for NASA Biomedical Data," Texas Collaboration Center Data Analytics Workshop, Houston, TX, Oct 2017 (Contributed Oral Presentation)
- "A Network-based Algorithm for Clustering Multivariate Longitudinal Data." Joint Statistical Meetings. Baltimore, MD. Aug 2017. (Contributed Oral Presentation)
- "Deterministic Bayesian variable selection for multistate models, with applications to ecological momentary assessment of an attempt to quit smoking." Joint Statistical Meetings. Chicago, IL. Aug 2016. (Contributed Oral Presentation)
- "Deterministic Bayesian Variable Selection for Binary Outcomes." Joint Statistical Meetings. Seattle, WA, Aug 2015. (Contributed Oral Presentation)
- "New England Water Resources-Historical Tracking of Harmful Algal Blooms Using Landsat Missions from 1984-2014." DEVELOP Summer Closeout at NASA Headquarters. Washington, D.C. Aug 2014. (Contributed Poster Presentation)

AWARDS

- Dr. M. Stewart West Memorial Scholarship, 2015
- UTHealth Division of Biostatistics Travel Award, 2015
- Richard D. Remington Memorial Student Scholarship, 2014
- Robert. H Bigelow Endowed Scholarship, 2013

MENTORING

- Justin Van Ee, Colorado State University, PhD Statistics student, Thesis Committee, Co-Advisor, 06/2021-Current
- Scott Liang, Rice University, PhD Statistics student, Co-mentor, 03/2019-Current
- Yefei Zhang, UTHealth, PhD Biostatistics candidate, Co-Thesis Director, 01/2017-Current
- Sherry WeMott-Colton, Colorado State University, Masters in Environmental Health student, Thesis Committee, External member, 01/2021-Current
- Yijun Wang, Colorado State University, PhD Mechanical Engineering candidate, Dissertation Committee, External member, 08/2020-Current
- Xin Tan, Rice University, Undergraduate in Statistics, Co-mentor, 05/2020-11/2020
- James Warner, Rice University, Rice Undergraduate Data Science Summer Program, 2018
- Karan Adams, Rice University, Rice Undergraduate Data Science Summer Program, 2018
- Stoyan Komitov, Rice University, Rice Undergraduate Data Science Summer Program, 2018
- Alex Aguilar, Rice University, PhD Statistics candidate, NASA Summer Intern, 2018
- Austin Vo, University of Central Florida, NASA Summer Intern, 2017
- UTHealth New Student Mentor, Fall 2013

COMPUTER SKILLS

Languages & Software: R, C++, Rcpp, Shiny, LaTeX, STATA, SAS, WinBUGS

PROFESSIONAL AFFILIATION

Member

- American Statistical Association, 2015 - Current
- International Society for Bayesian Analysis, 2020 - Current

PROFESSIONAL SERVICE

Associate Editor

- Journal of Classification

Reviewer

- Biometrical Journal, Biometrics, Biostatistics, Nature Communications, Journal of Classification

Board Member

- Johnson Space Center IRB, 2017 - 2018

Professional Conferences

- ENAR 2022, Invited session organizer, *Advanced Analytical Methods for mHealth Data*

Consultation

- Conference for Food Protection 2019: Program Standards Committee- Standard 8 Re-Evaluation of Staffing Level Model

DEPARTMENTAL SERVICE

Colorado State University

- Graduate Committee Fall 2021 - Spring 2022
- Statistics Seminar Series, Fall 2020 - Spring 2022
- Communications Committee Fall 2020 - Spring 2021

CONTINUING EDUCATION

- HACASA - Short Course "Randomized Clinical Trials-Replacing Traditional Analyses with Better Alternatives," Houston, TX, May 2018
- Joint Statistical Meetings - Short Course "Network Meta-Analysis," Baltimore, MD, Aug 2017
- Joint Statistical Meetings - Short Course "Evolution of Classification," Baltimore, MD, Aug 2017
- NASA Human Research Program Investigator's Workshop - "A New Dawn: Enabling Human Space Exploration," Galveston, TX, Jan 2017
- Technology Collaboration Center - "Omics Workshop," Houston, TX, Spring 2017
- Tableau Conference 2016 - Tableau Classroom Training- "Tableau Desktop II," Austin, TX, Fall 2016
- ENAR - Short Course "An Introduction to Statistical Machine Learning," Austin, TX, Spring 2016
- ENAR - Tutorial Session - "Data Visualizations in R with shiny and ggplot2," Austin, TX, Spring 2016
- ENAR - Tutorial Session - "High Performance Computing with R," Austin, TX, Spring 2016

- ASA Biopharmaceutical Section FDA - Industry Statistics Workshop - "Equivalence and Similarity Testing," Washington, DC, Fall 2015
- ASA Biopharmaceutical Section FDA - Industry Statistics Workshop - "Designing Observational Comparative Studies Using Propensity Score Methodology in Regulatory Settings," Washington, DC, Fall 2015
- Joint Statistical Meetings - "Adaptive Methods for Modern Clinical Trials," Seattle, WA, Summer 2015
- UT Summer Statistics Institute - "Introduction to Mixed Models with Applications," Austin, TX, Summer 2015
- UT Summer Statistics Institute - "Big Data Analytics," Austin, TX, Summer 2015

REFERENCES

Marina Vannucci, PhD marina@rice.edu
Noah Harding Professor of Statistics 713-348-6132
Department of Statistics
Rice University

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The University of Oklahoma Health Sciences Center

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Johnson Space Center
NASA