MARY LAI SALVAÑA, Ph.D.

ASSISTANT PROFESSOR IN STATISTICS

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Research Interests

EXTREME & CATASTROPHIC EVENTS, RISKS, DISASTERS, ANTIFRAGILITY, CLIMATE & ENVIRONMENTAL DATA SCIENCE, SPATIAL & SPATIO-TEMPORAL STATISTICS, HIGH-PERFORMANCE COMPUTING, COMPUTATIONAL STATISTICS, BIG DATA, MULTIVARIATE ANALYSIS, DEEP LEARNING, MACHINE LEARNING

Education

King Abdullah University of Science and Technology (KAUST)   *Jeddah, Saudi Arabia*
PHD IN STATISTICS   *January 2017 - July 2021*
- Thesis: Lagrangian Spatio-Temporal Covariance Functions for Multivariate Nonstationary Random Fields, Advisor: Marc G. Genton

Ateneo de Manila University   *Manila, Philippines*
MS IN APPLIED MATHEMATICS   *August 2015 - July 2016*
BS IN APPLIED MATHEMATICS   *June 2011 - March 2015*

Employment

Department of Statistics, University of Connecticut   *Storrs, CT, USA*
ASSISTANT PROFESSOR IN STATISTICS   *December 2023 – Present*

Statistics Department, KAUST   *Jeddah, Saudi Arabia*
VISITING PROFESSOR   *October 2023 – December 2023*

Department of Mathematics, University of Houston   *Houston, TX, USA*
POSTDOCTORAL RESEARCHER   *August 2021 – July 2023*

Honors & Awards

| 2021 | **Al-Kindi Statistics Research Student Award** | *KAUST* |

Publications

- **Salvaña, M. L. O.**, Lenzi, A., & Genton, M. G. (2023). *Spatio-temporal cross-covariance functions under the Lagrangian framework with multiple advections*. Journal of the American Statistical Association, 118(544), 2746-2761. https://doi.org/10.1080/01621459.2022.2078330.
- **Salvaña, M. L. O.**, Abdulah, S., Ltaief, H., Sun, Y., Genton, M. G., & Keyes, D. E. (2022). *Parallel space-time likelihood optimization for air pollution prediction on large-scale systems*. PASC '22: Proceedings of the Platform for Advanced Scientific Computing Conference, 17, 1-11. https://dl.acm.org/doi/pdf/10.1145/3539781.3539800.
- **Salvaña, M. L. O.**, Abdulah, S., Huang, H., Ltaief, H., Sun, Y., Genton, M. G., & Keyes, D. E. (2021). *High performance multivariate spatial modeling for geostatistical data on manycore systems*. IEEE Transactions on Parallel and Distributed Systems, 32(11), 2719-2733. https://ieeexplore.ieee.org/document/9397281.
- **Salvaña, M. L. O.**, & Genton, M. G. (2021). *Lagrangian spatio-temporal nonstationary covariance functions*. Book Chapter in Advances in Contemporary Statistics and Econometrics, Festschrift for Prof. C. Thomas-Agnan, 427-447. https://link.springer.com/chapter/10.1007/978-3-030-73249-3_22.

- **Salvaña, M. L. O.** & Genton, M. G. (2020). *Nonstationary cross-covariance functions for multivariate spatio-temporal random fields*. Spatial Statistics, 37, 100411. https://doi.org/10.1016/j.spasta.2020.100411.

Manuscripts

- **Salvaña, M. L. O.** & Jun, M. (2024) *3D bivariate spatial modelling of Argo ocean temperature and salinity profiles.* Under review. https://arxiv.org/pdf/2210.11611.pdf.
- **Salvaña, M. L. O.** & Genton, M. G. (2024) *Taylor's hypothesis for non-frozen nonstationary spatio-temporal random fields*. In preparation.
- **Salvaña, M. L. O.**, Abdulah, S., Kim, M., Helmy, D., Sun, Y., & Genton, M. G. (2024) *MPCR: Multi- and Mixed-Precision Computations Package in R*. https://arxiv.org/pdf/2406.02701. Under review.

Software

- DiffOp: https://github.com/marysalvana/DiffOp (Author)
- ExaGeoStat: https://github.com/ecrc/exageostat (Contributor)
- MPCR: https://github.com/stsds/MPCR (Contributor)

Presentations

Joint Statistical Meeting	*Portland, OR, USA*
TOPIC-CONTRIBUTED TALK: MPCR: Multi- and Mixed-Precision Computations Package in R	*August 2024*
EAC-ISBA Conference	*The Education University of Hong Kong, Hong Kong*
INVITED TALK: MPCR: Multi- and Mixed-Precision Computations Package in R	*June 2024*
The 37th New England Statistics Symposium	*University of Connecticut, Storrs, CT, USA*
INVITED TALK: Multi- and Mixed-Precision Computations for Spatial and Spatio-Temporal Statistics	*May 2024*
KAUST: Statistics Workshop	*Jeddah, Saudi Arabia*
POSTER PRESENTATION: MPCR: Multi- and Mixed-Precision Computations Package in R	*November 2023*
University of Connecticut	*Storrs, CT, USA*
SEMINAR: 3D bivariate spatial modelling of Argo ocean temperature and salinity profiles	*January 2023*
Duke University	*Durham, NC, USA*
SEMINAR: 3D bivariate spatial modelling of Argo ocean temperature and salinity profiles	*January 2023*
Pennsylvania State University	*University Park, PA, USA*
SEMINAR: 3D bivariate spatial modelling of Argo ocean temperature and salinity profiles	*January 2023*
Michigan State University	*East Lansing, MI, USA*
SEMINAR: 3D bivariate spatial modelling of Argo ocean temperature and salinity profiles	*January 2023*
Auburn University	*Auburn, AL, USA*
SEMINAR: 3D bivariate spatial modelling of Argo ocean temperature and salinity profiles	*January 2023*
George Mason University	*Fairfax, VA, USA*
SEMINAR: 3D bivariate spatial modelling of Argo ocean temperature and salinity profiles	*January 2023*
University of Iowa	*Iowa City, IA, USA*
SEMINAR: 3D bivariate spatial modelling of Argo ocean temperature and salinity profiles	*December 2022*
Indiana University	*Bloomington, IN, USA*
SEMINAR: 3D bivariate spatial modelling of Argo ocean temperature and salinity profiles	*December 2022*
Texas A&M University Conference on Advances in Data Science: Theory, Methods, and Computation	*College Station, TX, USA*
POSTER PRESENTATION: 3D bivariate spatial modelling of Argo ocean temperature and salinity profiles	*October 2022*
ENVR Workshop: Environmental and Ecological Statistical Research and Applications with Societal Impacts	*Provo, UT, USA*
POSTER PRESENTATION: 3D bivariate spatial modelling of Argo ocean temperature and salinity profiles	*October 2022*
Institute for Mathematical and Statistical Innovation Workshop: Expressing and Exploiting Structure in Modeling, Theory, and Computation with Gaussian Processes	*Chicago, IL, USA*
POSTER PRESENTATION: 3D bivariate spatial modelling of Argo ocean temperature and salinity profiles	*August 2022*
Joint Statistical Meeting (JSM)	*Washington DC, USA*
TOPIC-CONTRIBUTED TALK: Parallel space-time likelihood optimization for air pollution prediction on large-scale systems	*August 2022*
Platform for Advanced Scientific Computing (Online)	*Basel, Switzerland*
TOPIC-CONTRIBUTED TALK: Parallel space-time likelihood optimization for air pollution prediction on large-scale systems.	*June 2022*

Joint Statistical Meeting (Online) *Philadelphia, PA, USA*
TOPIC-CONTRIBUTED TALK: Lagrangian spatio-temporal nonstationary covariance functions *August 2020*
Joint Statistical Meeting *Denver, CO, USA*
TOPIC-CONTRIBUTED TALK: Spatio-temporal cross-covariance functions under the Lagrangian framework *August 2019*
KAUST Statistics Workshop *Jeddah, Saudi Arabia*
POSTER PRESENTATION *November 2018, 2019*

Short Course

1. 2024: *Large Scale Spatial Data Science* (Half day), **Joint Statistical Meeting** *Portland, OR, USA*
2. 2024: *Large Scale Spatial Data Science* (Full day), **The 37th New England Statistics Symposium** *University of Connecticut, Storrs, CT, USA*

Teaching

Department of Statistics, University of Connecticut *Storrs, CT, USA*
1. *Applied Spatio-Temporal Statistics (STAT 4845/5845)*, 3-credit undergraduate/graduate level, Fall 2024
2. *Introduction to Mathematical Statistics I (STAT 3375Q)*, 3-credit undergraduate level, Spring 2024

Statistics Department, KAUST *Jeddah, Saudi Arabia*
1. *Linear Models*, 3-credit graduate level, Fall 2020

Conference Organization

1. 2024: Poster and Scholarship Subcommittee, **2024 Statistics in Pharmaceuticals (SiP)** *University of Connecticut, Storrs, CT, USA*
2. 2024: Session Chair, *Sports Analytics Beyond the Field*, **2024 UConn Sports Analytics Symposium (UCSAS)** *University of Connecticut, Storrs, CT, USA*
3. 2023: Session Organizer & Session Chair, *Opportunities & Challenges in the Use of Statistics in Disaster Science*, **2023 New England Statistics Symposium (NESS)** *Boston University, MA, USA*

Departmental Service

Department of Statistics, University of Connecticut *Storrs, CT, USA*
1. 2024: R. Makuch Distinguished Lecture Committee
2. 2024: Library/Tech Reports Committee

Professional Associations

1. American Statistical Association Member
2. New England Statistical Society Member
3. Institute of Mathematical Statistics Member
4. Ateneo Innovation Center Research Fellow

Journal Reviews

Journal of Computational and Graphical Statistics, Journal of the Royal Statistical Society: Series C, Computational Statistics and Data Analysis, Statistics and Computing, Journal of Data Science, Data Science in Science, STAT, Biostatistics