

# Claudia R. Solís-Lemus

## Curriculum Vitae

### Employment

- 2019–present **Assistant Professor**, *Joint appointment in Wisconsin Institute for Discovery and Department of Plant Pathology*, University of Wisconsin-Madison.  
UW Affiliations: Department of Statistics, Department of Mathematics, Department of Biostatistics and Medical Informatics, JF Crow Institute for the Study of Evolution, Quantitative Biology Initiative, Center for Genomic Innovation, Data Science Institute

### Education

- 2010–2015 **Ph.D., Statistics**, *University of Wisconsin-Madison*, Madison.  
2013 **M.A., Mathematics**, *University of Wisconsin-Madison*, Madison.  
2003–2008 **B.S., Applied Mathematics**, *Instituto Tecnológico Autónomo de México (ITAM)*, Mexico City, Summa cum laude.  
2003–2008 **B.S., Actuarial Sciences**, *Instituto Tecnológico Autónomo de México (ITAM)*, Mexico City, Summa cum laude.

### Publications

Google Scholar link

Pre-prints (submitted to peer review)

- 2024 **HighDimMixedModels.jl: Robust High Dimensional Mixed Models across Omics Data**, Gorstein, E.\*, Aghdam, R.\*. and C. Solís-Lemus, [bioRxiv:2024.05.09.593305](#).
- 2023 **Unsupervised Learning of Phylogenetic Trees via Split-Weight Embedding**, Kong, Y.\*, Tiley, G. and C. Solís-Lemus, [arXiv:2312.16074](#).
- 2023 **Extracting diamonds: Identifiability of 4-node cycles in level-1 phylogenetic networks under a pseudolikelihood coalescent model**, Tiley, G. and C. Solís-Lemus, [biorXiv:2023/564087](#).
- 2023 **Human Limits in Machine Learning: Prediction of Plant Phenotypes Using Soil Microbiome Data**, Aghdam, R.\*, Tang, X.\*, Shan, S., Lankau, R., C. Solís-Lemus, [arXiv:2306.11157](#).
- 2022 **Detectability of Varied Hybridization Scenarios using Genome-Scale Hybrid Detection Methods**, Bjorner, M.\*, E. K. Molloy, C. N. Dewey, and C. Solís-Lemus, [arXiv:2211.00712](#).
- 2022 **BioKlustering: a web app for semi-supervised learning of maximally imbalanced genomic data**, Ozminkowski, S.\*, Y. Wu\*, L. Yang\*, Z. Xu\*, L. Selberg\*, C. Huang\* and C. Solís-Lemus, [arXiv:2209.11730](#).
- 2021 **A Kernel Method for Dissecting Genetic Signals in Tests of High-Dimensional Phenotypes**, Solís-Lemus, C., A. M. Holleman, A. Todor, B. Bradley, K. J. Ressler, D. Ghosh, M. P. Epstein, [bioRxiv:2021.07.29.454336](#).
- 2021 **CARlasso: An R package for the estimation of sparse microbial networks with predictors**, Shen, Y.\*, Solís-Lemus, C., [arXiv:2107.13763](#).
- 2020 **Bayesian Conditional Auto-Regressive LASSO Models to Learn Sparse Networks with Predictors**, Shen, Y.\*, Solís-Lemus, C., [arXiv:2012.08397](#).
- 2020 **On the identifiability of phylogenetic networks under a pseudolikelihood model**, Solís-Lemus, C., Coen, Arrigo\*, C. Ané, [arXiv: 2010.01758](#).

- 2024 **Benefits and Limits of Phasing Alleles for Network Inference of Allopolyploid Complexes**, *Tiley, G., Crowl, A., Manos, P., Sessa, E., Solís-Lemus, C., Yoder, A., Burleigh, G.*, Syst Bio.  
DOI: 10.1093/sysbio/syae024
- 2024 **Identifying microbial drivers in biological phenotypes with a Bayesian Network Regression model**, *Ozminkowski, S.\* and C. Solís-Lemus*, Ecology and Evolution.  
DOI: 10.1002/ece3.11039
- 2024 **The Effect of the Prior and the Experimental Design on the Inference of the Precision Matrix in Gaussian Chain Graph Models**, *Shen, Y.\*, Solís-Lemus, C.*, JABES.  
DOI: 10.1007/s13253-024-00621-1
- 2024 **MiNAA: Microbiome Network Alignment Algorithm**, *Nelson, R.\*, Aghdam, R.\*, C. Solís-Lemus*, JOSS.  
DOI: 10.2115/joss.05448
- 2024 **Estimating Sparse Direct Effects in Multivariate Regression With the Spike-and-Slab LASSO**, *Shen, Y.\*, C. Solís-Lemus. S.K. Deshpande*, Bayesian Analysis.  
DOI: 10.1214/24-BA1430
- 2024 **Ultrafast learning of 4-node hybridization cycles in phylogenetic networks using algebraic invariants**, *Wu, Z.\*, C. Solís-Lemus*, Bioinformatics Advances.  
DOI: 10.1093/bioadv/vbae014
- 2024 **Novel Symmetry-preserving Neural Network Model for Phylogenetic Inference**, *Tang, X.\*, Zepeda-Nunez, L., S. Yang\*, Z. Zhao\*, C. Solís-Lemus*, Bioinformatics Advances.  
DOI: 10.1093/bioadv/vbae022
- 2023 **Machine learning identification of Pseudomonas aeruginosa strains from colony image data**, *Ratray, JB, Walden, R., Marquez-Zacarias, P., Molotkova, E., Perron, G., Solís-Lemus, C., Pimentel-Alarcon, D., Brown, S*, PLoS Comp Bio.  
DOI: 10.1371/journal.pcbi.1011699
- 2023 **SiPhyNetwork: An R package for simulating phylogenetic networks**, *J. Justison, Solís-Lemus, C., T. Heath*, bioRxiv:10.1101/2022.10.26.513953, Methods of Ecology and Evolution.  
DOI: 10.1111/2041-210X.14116
- 2022 **Classification of animal sounds in a hyperdiverse rainforest using Convolutional Neural Networks**, *Y. Sun\*, T. M. Maeda, Solís-Lemus, C., D. Pimentel-Alarcon, Z. Burivalova*, arXiv:2111.14971, Ecological Indicators.  
DOI: 10.1016/j.ecolind.2022.109621
- 2022 **WI Fast Stats: a collection of web apps for the visualization and analysis of WI Fast Plants data**, *Liu, Y.\*, Solís-Lemus, C.*, JOSE, DOI:10.21105/jose.00159.  
arXiv:2012.03290
- 2022 **Towards a robust out-of-the-box neural network model for genomic data**, *Zhang, Z.\*, Cheng, S.\* Solís-Lemus, C.*, BMC Bioinformatics, DOI:10.1186/s12859-022-04660-8.  
arXiv (2020):2012.05995
- 2022 **Efficient Estimation of Indirect Effects in Case-Control Studies Using a Unified Likelihood Framework**, *G. A. Satten, S. W. Curtis, C. Solís-Lemus, E. J. Leslie, M. P. Epstein*, Statistics in Medicine: DOI 10.1002/sim.9390, bioRxiv:10.1101/2021.07.16.452552.
- 2021 **Effect of genetic background on the evolution of Vancomycin-Intermediate Staphylococcus aureus (VISA)**, *Su, M., Hargita Davis, M.N., Peterson, J., Solís-Lemus, C., Satola, S.W. and T. Read*, PeerJ, DOI: 10.7717/peerj.11764.
- 2021 **Genes influencing phage host range in Staphylococcus aureus on a species-wide scale**, *Moller, A., Winston, K., Ji, S., Wang, J.\*, Hargita Davis, M.N., Solís-Lemus, C. and T. Read*, mSphere, DOI: 10.1128/mSphere.01263-20.
- 2020 **A generalized measure of relative dispersion**, *Guerrero, V. and C. Solís-Lemus*, Stat. and Prob. Letters.

- 2020 **Genomic analysis of variability in delta-toxin levels between *Staphylococcus aureus* strains**, M. Su, J. Lyles, R. A. Petit III, J. M. Peterson, M. Hargita, H. Tang, C. Solís-Lemus, C. Quave, T. D. Read, PeerJ, doi:10.7717/peerj.8717.
- 2020 **Leveraging family history in case-control analyses of rare variation**, C. Solís-Lemus, S.T. Fischer, A. Todor, C. Liu, E.J. Leslie, D. Cutler, D. Ghosh, M.P. Epstein, Genetics, doi: 10.1534/genetics.119.302846.  
(Genetics editors Highlights of February 2020)
- 2020 **Prediction of functional markers of mass cytometry data via deep learning**, C. Solís-Lemus, X. Ma, M. Hostetter II, S. Kundu, P. Qiu, D. Pimentel-Alarcón, Statistical Modeling in Biomedical Research, Springer.
- 2018 **Greatly reduced phylogenetic structure in the cultivated potato clade (*Solanum* section *Petota* pro parte)**, Spooner, D.M., H. Ruess, C. Arbizu, F. Rodríguez, and C. Solís-Lemus, American Journal of Botany, doi:10.1002/ajb2.1008.
- 2018 **Phylogenetic comparative methods on phylogenetic networks with reticulations**, Bastide, P., C. Solís-Lemus, R. Kriebel, K.W. Sparks, and C. Ané, Systematic Biology, doi: 10.1093/sysbio/syy033.
- 2017 **PhyloNetworks: a package for phylogenetic networks**, Solís-Lemus, C., P. Bastide and C. Ané, Molecular Biology and Evolution, doi: 10.1093/molbev/msx235.
- 2016 **Inferring phylogenetic networks with maximum pseudolikelihood under incomplete lineage sorting**, Solís-Lemus, C. and C. Ané, PLoS Genetics 12(3):e1005896, doi:10.1371/journal.pgen.1005896.  
(PLOS Genetics Top 10%)
- 2016 **Inconsistency of species-tree methods under gene flow**, Solís-Lemus, C., M. Yang and C. Ané, Systematic Biology, doi: 10.1093/sysbio/syw030.
- 2016 **Statistical evidence for common ancestry: application to primates**, Baum, D., C. Ané, B. Larget, C. Solís-Lemus, L.S.T. Ho, P. Boone, C. Drummond, M. Bontrager, S. Hunter, B. Saucier, Evolution, doi: 10.1111/evo.12934.
- 2015 **Bayesian species delimitation combining multiple genes and traits in a unified framework**, Solís-Lemus, C., L.L. Knowles and C. Ané, Evolution, 2:69,492–507.

#### Conference papers

- 2018 **Breaking the Limits of Subspace Inference**, Solís-Lemus, C., D. Pimentel-Alarcón, 56th Annual Allerton Conference on Communication, Control, and Computing.
- 2017 **Processus d'évolution réticulée: tests de signal phylogénétique**, Ané, C., P. Bastide, M. Mariadassou, S., and C. Solís-Lemus, Journées de Statistique.
- 2017 **Adversarial Principal Component Analysis**, Pimentel-Alarcón, D., A. Biswas and C. Solís-Lemus, IEEE International Symposium on Information Theory (ISIT).
- 2016 **Crime detection via crowdsourcing**, Pimentel-Alarcón, D. and C. Solís-Lemus, 8th Mexican Conference on Pattern Recognition, Springer International.

\* Member of Solis-Lemus lab

## Grants

### Awarded

- 2024–2028 **USDA-Individual hatch**, *Enhanced interaction and network statistical models for microbiome data*, Role: PI.
- 2023–2027 **NSF IntBIO Collaborative Research**, *Assessing drivers of the nitrogen-fixing symbiosis at continental scales*, Role: co-PI, (co-PI: Ryan Folk, Mississippi State U).
- 2022–2027 **USDA NIFA**, *Unraveling The Microbial Mechanisms That Mediate Disease Resurgence In Plants Following Fungicide Application*, Role: co-PI, (co-PI: Paul Koch, UW-Madison).
- 2022–2027 **NSF CAREER**, *Towards robust and scalable inference of phylogenetic networks*, Role: PI.
- 2020 **Wisconsin Potato and Vegetable Growers Association, Inc.**, *Development of bioinformatic tools to leverage certification data for enhanced seed potato production*, Role: PI.

- 2020–2022 **DOE – Computational Tool Development for Integrative Systems Biology**, *Harnessing the power of big omics data: Novel statistical tools to study the role of microbial communities in fundamental biological processes*, Role: PI, (NCE to 2023).
- 2020–2021 **USDA-hatch**, *Novel interaction and network statistical models for microbiome data*, Role: PI.
- 2019 **NIH K99/R00 Path to Independence**, *Enhanced Penalized Regression Methods for Detecting Trait Loci in GWAS*, Role: PI.  
Score: 20 (withdrawn due to faculty job)

## Fellowships and Awards

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|------|---|------------------------------------|
| 2024 | Holstrom Environmental Undergraduate Research Fellowship (Tianyi Xu)      | UW-Madison                         |
| 2022 | Hilldale Faculty/Undergraduate Research Fellowship (Bella Wu)             | UW-Madison                         |
| 2021 | Holstrom Environmental Undergraduate Research Fellowship (Yuren Sun)      | UW-Madison                         |
| 2020 | Solis-Lemus et al (2016) paper listed in PLOS Genetics Top 10% Collection |                                    |
| 2020 | Hilldale Faculty/Undergraduate Research Fellowship (Zhaoyi Zhang)         | UW-Madison                         |
| 2020 | Madison Teaching and Learning Excellence Fellow                           | UW-Madison                         |
| 2019 | Reviewers' choice award   | American Society of Human Genetics |
| 2015 | Student travel support  | Society for Systematic Biologists  |
| 2015 | Vilas conference presentation funds                                       | UW-Madison                         |
| 2014 | Advanced Computing Infrastructure Fellowship                              | UW-Madison                         |
| 2012 | College of Letters and Science Teaching Fellowship                        | UW-Madison                         |
| 2009 | Ex-ITAM Research Award in Actuarial Sciences                              | ITAM                               |
| 2008 | Social Responsibility Award   | ITAM                               |
| 2003 | Academic Excellence Scholarship   | ITAM                               |

## Software development

- 2024 **HighDimMixedModels.jl**, <https://github.com/solislemuslab/HighDimMixedModels.jl>, A Julia package for fitting regularized linear mixed-effect models on high-dimensional omics data..
- 2023 **PhyloClustering.jl**, <https://github.com/solislemuslab/PhyloClustering.jl>, A Julia package to perform unsupervised learning on phylogenetic trees.
- 2023 **PhyloDiamond.jl**, <https://github.com/solislemuslab/PhyloDiamond.jl>, A Julia package to estimate phylogenetic networks from algebraic invariants.
- 2022 **MiNAA**, <https://github.com/solislemuslab/minaa>, C++ software to align two biological networks based on topology and biology.
- 2022 **BioKlustering**, <https://bioklustering.wid.wisc.edu/>, Web app to cluster unaligned genomics sequences for partially labelled samples.
- 2022 **BayesianNetworkRegression.jl**, <https://github.com/solislemuslab/BayesianNetworkRegression.jl>, A Julia package for fitting Bayesian Network Regression models to infer the relationships between microbiome networks and biological phenotypes.
- 2021 **CARlasso**, <https://yunyishen.ml/CAR-LASSO/dev/>, An R package for the reconstruction of microbial networks with predictors.
- 2020 **WI Fast Stats**, <https://wi-fast-stats.wid.wisc.edu/>, A collection of web apps for the data analysis and data visualization for WI Fast Plants.
- 2015 **PhyloNetworks**, <https://github.com/crsl4/PhyloNetworks>, Julia package for phylogenetic networks including estimation method SNaQ.
- 2014 **iBPP**, <https://github.com/cecileane/iBPP>, Bayesian species delimitation integrating genes and traits.

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## Research Experience

- 2017–2019 **Postdoctoral fellow**, *NIH-supported project*, Epilepsy consortium and 22q11.1 deletion syndrome consortium, PI: Michael Epstein.  
Emory University
- 2016–2017 **Postdoctoral research**, *NSF-supported project*, Improved Bayesian phylogenetic inference based on approximate conditional independence, PI: Bret Larget.  
University of Wisconsin-Madison
- 2014–2015 **Research assistant**, *NSF-supported project*, ATOL: Assembling a taxonomically balanced genome-scale reconstruction of the evolutionary history of the Enterobacteriaceae, PI: Nicole Perna, Bret Larget, Cécile Ané, Colin Dewey.  
University of Wisconsin-Madison
- 2013–2014 **Research assistant**, *NSF-supported project*, Reconciling gene trees: Deciphering the source and extent of genealogical discordance, PI: David Spooner, David Baum, Bret Larget, Cécile Ané, Gregory Thain.  
University of Wisconsin-Madison

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## Teaching Experience

At UW-Madison

- Spring 2024 **Botany/Plant Path 563**, *Phylogenetic analysis of molecular data*, A course in the theory and practice of phylogenetic inference from DNA sequence data. Students will learn all the necessary components of state-of-the-art phylogenomic analyses and apply the knowledge to the data analyses of their own organisms, UW-Madison.
- Spring 2023 **Botany 563**, *Phylogenetic analysis of molecular data*, A course in the theory and practice of phylogenetic inference from DNA sequence data. Students will learn all the necessary components of state-of-the-art phylogenomic analyses and apply the knowledge to the data analyses of their own organisms, UW-Madison.
- 2023 **Guest lecture**, *LAW 915: Statistics for Forensic Science*, (Spring and Fall).
- 2023 **Guest lecture**, *BMI 826: Inferring Biological Networks*.
- 2022 **Guest lecture**, *ENVIR ST 400: Deep learning in Biology*.
- 2022 **Guest lecture**, *STAT 609/849: Statistical models for biological applications*.
- 2022 **Guest lecture**, *LAW 915: Statistics for Forensic Science*.
- Spring 2022 **Botany 563**, *Phylogenetic analysis of molecular data*, A course in the theory and practice of phylogenetic inference from DNA sequence data. Students will learn all the necessary components of state-of-the-art phylogenomic analyses and apply the knowledge to the data analyses of their own organisms, UW-Madison.
- Spring 2022 **Plant Path 875**, *Readings in phylogenomics*, This course will be a journal club where students will read and discuss the current literature related to phylogenomic analyses, UW-Madison.
- 2021 **Guest lecture**, *BME 780: An overview of phylogenetic inference*.
- 2021 **Guest lecture**, *STAT 609/849: Statistical models for biological applications*.
- Spring 2021 **Botany 563**, *Phylogenetic analysis of molecular data*, A course in the theory and practice of phylogenetic inference from DNA sequence data. Students will learn all the necessary components of state-of-the-art phylogenomic analyses and apply the knowledge to the data analyses of their own organisms, UW-Madison.
- Spring 2021 **Plant Path 875**, *Readings in phylogenomics*, This course will be a journal club where students will read and discuss the current literature related to phylogenomic analyses, UW-Madison.
- 2020 **Guest lecture**, *STAT 609/849: Statistical models for biological applications*, (virtual).
- 2016 **Guest lecture**, *Botany 563: Phylogenetic networks*, UW-Madison.
- 2015 **The hacker within series – UW Madison**, *Short introduction to Julia*.
- 2015 **Statistics student seminar – UW Madison**, *Short introduction to HTCondor*.
- 2014 **Teaching assistant**, *Statistics tutorial: PhD qualifying examination summer camp*, UW-Madison.

- 2012–2013 **Teaching assistant**, *Regression methods for population health*, UW-Madison, Professor Ron Gangnon.
- 2011–2012 **Teaching assistant**, *Introduction to Biostatistics for population health*, UW-Madison, Professor Ron Gangnon.
- 2011 **Teaching assistant**, *Introduction to Statistical methods*, UW-Madison, Professor Kevin Packard (Spring), Kam Wah Tsui (Summer).
- 2010 **Teaching assistant**, *Introduction to theory and methods of mathematical statistics I*, UW-Madison, Professor Zhengjun Zhang.

Outside of UW-Madison

- 2023 **Workshop on Methodological Advances in Reticulate Evolution**, *Invited faculty*, Edinburgh Botanical Gardens, Edinburgh, Scotland.
- 2023 **Workshop on Methodological Advances in Reticulate Evolution**, *Invited faculty*, Kew Botanical Gardens, Richmond, UK.
- 2023 **Botany conference 2023**, *Workshop: Estimating phylogenetic networks with SNaQ*.
- 2023 **Molecular Evolution Workshop: Phylogenetic networks**, *Invited Faculty*, Marine Biology Lab (MBL), Woods Hole, MA.
- 2023 **SSB 2023 Satellite**, *Workshop: Introduction to PhyloNetworks*, Mexico City.
- 2022 **AI Summer School**, *Deep learning in Biology*, August 10, 2022, UChicago.
- 2022 **Molecular Evolution Workshop: Phylogenetic networks**, *Invited Faculty*, Marine Biology Lab (MBL), Woods Hole, MA.
- 2022 **International Society of Molecular Biology Meeting**, *Workshop: Julia for Data Science*, Co-taught with Doug Bates.
- 2022 **Scalable inference of phylogenetic networks**, *RADsequencing for phylogenOMICS*, Taxon-OMICS partners from Göttingen, München and Braunschweig.
- 2021 **Virtual Species Delimitation workshop**, *Invited Faculty*, National Museum of Natural History, (virtual).
- 2021 **Seminario de Investigacion de la Escuela de Estadística**, *Julia workshop for Data Science*, Universidad de Los Andes, Mérida, Venezuela, (taught in Spanish).
- 2021 **WID Data Science Research Bazaar**, *Julia workshop for Data Science*, (co-taught with Douglas Bates).
- 2020 **Molecular Evolution Workshop: Phylogenetic networks**, *Invited Faculty*, Marine Biology Lab (MBL), Woods Hole, MA.  
(cancelled due to COVID19)
- 2020 **Mexicanas en Ciencias de Datos**, *Julia workshop for Data Science*, Virtual event organized by CIMAT.
- 2020 **WI Fast Plants webinar**, *Data analysis tools for WI Fast plants data*, (webinar for high-school teachers in Biology).
- 2019 **R developer workshop – Nantucket, MA**, *From mindful programming to reproducible research*.
- 2019 **Taming the BEAST – Squamish, BC**, *Invited Faculty*, Bayesian phylogenetic inference for big data.
- 2019 **Taming the BEAST – Squamish, BC**, *Invited Faculty*, Statistical models on phylogenetic networks.
- 2019 **Molecular Evolution Workshop – Woods Hole, MA**, *Invited Faculty*, Statistical models on phylogenetic networks.
- 2017 **Human Genetics Meeting – Emory University**, *Julia: why do we need another language?*.
- 2016 **Instituto de Biología – UNAM**, *PhyloNetworks: julia package for phylogenetic networks*.
- 2016 **Phylogenomics symposium and software school – Evolution meeting**, *PhyloNetworks: julia package for phylogenetic networks*.
- 2010 **Instructor in Mathematics**, *Advanced Algebra II*, ITAM.
- 2010 **Instructor in Mathematics**, *Calculus II*, ITAM.
- 2009 **Instructor in Mathematics**, *Calculus III*, ITAM.
- 2009–2010 **Instructor in Actuarial Sciences**, *Actuarial Mathematics I*, ITAM.

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## Presentations

### Invited talks

- 2024 **Data Science Symposium**, *Inferring Biological Networks*, Loyola University.
- 2024 **WID Seminar**, *Statistical and Computational Challenges in Phylogenetic Inference*, Co-presenter: Kris Sankaran, Lab presenters: Nathan Kolbow, Hailey Louw, Yibo Kong.
- 2023 **American Statistical Association**, *Reproducibility and mindful programming*.
- 2023 **Algebraic Statistics for Ecological and Biological Systems**, *Ultrafast learning of 4-node hybridization cycles using phylogenetic invariants*, Institute for Mathematical and Statistical Innovation (IMSI), University of Chicago.
- 2023 **BMI Seminar**, *Inferring networks*, (UW-Madison).
- 2023 **Evolution conference**, *Identifiability of 4-node hybridization cycles in phylogenetic networks*.
- 2023 **Botany conference**, *Inferring phylogenetic networks*.
- 2023 **Toronto Workshop on Reproducibility**, *Accessible reproducibility for biological researchers*.
- 2023 **Biological Interactions Program**, *Biological Data Science*, (UW-Madison).
- 2023 **WID seminar**, *Biological Networks from Adaptable Mathematics*, (UW-Madison).
- 2023 **SSB Standalone Meeting**, *Statistical models on phylogenetic networks*, (Mexico City, remote).
- 2022 **PBEE seminar at Emory University**, *From phylogenetic networks to microbial networks: novel tools for networked data*.
- 2022 **Statistics seminar – UW-Madison**, *Inferring networks*, (Lightning talk).
- 2022 **Evolution conference**, *Invited panelist for the iEvoBio panel "Build it right from the start"*.
- 2022 **Evolution conference**, *Statistical challenges to infer phylogenetic networks*, Symposium: Towards the Network of Life.
- 2022 **EEOB seminar at Iowa State University**, *Statistical challenges to infer phylogenetic networks*.
- 2021 **Coloquio de la Sociedad Matemática Mexicana**, *Biología Evolutiva a través de los ojos de Ciencias de Datos*.
- 2021 **ISCB EvolCompGen: Evolution and Comparative Genomics**, *Scalable inference of phylogenetic networks*.
- 2021 **I Congreso Latinoamericano de Evolución**, *Metodos estadísticos para reconstruir redes filogenéticas*.
- 2021 **Organisms and Evolution seminar at Duke University**, *Statistical challenges on phylogenetic networks*, Invited speaker selected by graduate students.
- 2021 **American Mathematical Society: Special Section on Phylogenetic Networks**, *Identifiability of phylogenetic networks under the multispecies coalescent model*.
- 2021 **Delta Beer Lab: The adventures of the statistician's rule of thumb**, *WI Science Festival*.
- 2021 **Biology seminar series – University of Florida**, *From phylogenetic networks to microbial networks: statistical tools for networked data*.
- 2021 **Kenneth B. Raper Symposium – UW-Madison**, *Novel methods to reconstruct microbial networks with environmental or experimental predictors*.
- 2021 **ClubEcoEvo Latinoamerica**, *Metodos Estadísticos para estudiar comunidades microbianas*.
- 2021 **Think STEM**, *Career Exploration Center at UW-Madison*, (audience: high school students).
- 2021 **Universidad de La Paz**, *Through the looking glass of Data Science*.
- 2021 **BISP12**, *Bayesian CAR-LASSO model to learn sparse networks with predictors*, (virtual in Italy).
- 2021 **INFORMS en español**, *Biología evolutiva a través de los ojos de Ciencias de Datos*, (Rice University).
- 2021 **NZ seminar in Algorithms and Complexity in Phylogenetics**, *Scalable inference of phylogenetic networks*.
- 2021 **University of Georgia – Athens**, *Scalable inference of phylogenetic networks*.

- 2021 **Department of Statistics – Ohio State University**, *Scalable inference of phylogenetic networks*.
- 2021 **Department of Ecology and Evolutionary Biology – Ohio State University**, *Scalable inference of phylogenetic networks*.
- 2021 **Bioinformatics Institute – University of North Carolina**, *Scalable inference of phylogenetic networks*.
- 2021 **CIBM – UW-Madison**, *New challenges in phylogenetic inference*.
- 2021 **Wednesday at the Lab – University of Wisconsin-Madison**, *Through the looking glass of Data Science*, (audience: general public).
- 2021 **El Zoominario**, *Learning the Tree of Life*, (audience: general public).
- 2020 **Biology seminar – University of Central Florida**, *Comparative methods on phylogenetic networks*.
- 2020 **Department of Statistics – University of British Columbia**, *Scalable inference of phylogenetic networks*.
- 2020 **The Biology Department – George Washington University**, *Scalable inference of phylogenetic networks*, (invited by graduate students).
- 2020 **Department of Biological Sciences – Auburn University**, *Scalable inference of phylogenetic networks*.
- 2020 **BadgerTalks – Cedarburg Public Library**, *Through the looking glass of Data Science*, (talk for general audience interested in women in STEM).
- 2020 **WID symposium – Lightning talk**, *Statistical methods for biological applications*.
- 2020 **SBE Meeting – Methods in phylogenomics**, *What are phylogenetic networks and why should we care?*.
- 2020 **Microbiome Hub Seminar – WID**, *Scalable Inference of Phylogenetic Networks*.
- 2020 **Illuminating connections – WID**, *Identifying Genetic Factors Driving Microbial Phenotypes Through the Power of Data Science*.
- 2020 **Statistics seminar – UW-Madison**, *New challenges in phylogenetic inference*.
- 2019 **R developer workshop – Nantucket, MA**, *From mindful programming to reproducible research*.
- 2019 **Bio-mathematics seminar – Georgia Tech, Atlanta, GA**, *Phylogenetic inference for big data*.
- 2019 **HAMLET seminar – UW-Madison**, *Using neural networks to predict antibiotic-resistance from genomic data*.
- 2019 **Women in STEM conference – Georgia State University**, *Through the looking glass of Data Science*.
- 2018 **Statistics seminar – Creighton University**, *Statistical methods to identify genes associated with disease*.
- 2018 **BUGS seminar – Georgia Institute of Technology**, *Statistical methods to reconstruct phylogenetic networks*.
- 2017 **Microbiome group – Emory University**, *Statistical methods to reconstruct phylogenetic networks*.
- 2017 **CIBS Seminar – Emory University**, *Statistical methods and Julia computings tools for the reconstruction of the tree of life*.
- 2017 **Human Genetics Seminar – Emory University**, *Phylogenetic inference for big data*.
- 2017 **Mathematical Approaches to Evolutionary Trees and Networks – BIRS**, *Likelihood challenges for big trees and networks*.
- 2016 **Statistics Seminar – UW-Madison**, *Phylogenetic inference for Big Data*.
- 2016 **Instituto de Biología UNAM – Mexico City, Mexico**, *Quartet-based inference of phylogenetic networks*.
- 2016 **Simposio de Inferencia y modelación estadística – Guanajuato, Mexico**, *Bayesian phylogenetic inference for big data*.
- 2016 **SSB symposium: Advances in the analysis of reticulate population networks – Evolution meeting**, *Quartet-based inference of phylogenetic networks*.



- 2016 **Phylogenomics symposium and software school – Evolution meeting**, *Quartet-based estimation of reticulate evolution*.
- 2015 **System Information Learning Optimization Seminar – UW Madison**, *Statistical inference of phylogenetic networks*.
- 2015 **Evolution Seminar Series – UW Madison**, *Fast reconstruction of hybridization networks from multilocus data*.
- 2015 **Networks seminar – UW Madison**, *Statistical inference on phylogenetic networks*.
- 2015 **Statistics student seminar – UW Madison**, *Statistical inference on phylogenetic networks*.
- 2014 **Seminario Aleatorio – ITAM**, *The role of Statistics in the inference of the Tree of Life*.
- Contributed talks
- 2023 **Botany conference**, *Phylogenetic networks to study reticulate evolution*, (co-organized symposium with George Tiley).
- 2021 **JuliaCon (virtual)**, *PhyloNetworks: a julia package for phylogenetic networks*.
- 2021 **Evolution conference (virtual)**, *Behind the scenes of phylogenetic reconstructions with SNaQ*.
- 2020 **JSM – Statistical Methods in Phylogenetics**, *Fast reconstruction of Phylogenetic Networks*.
- 2018 **JSM – Advanced statistical inference for stochastic models of evolutionary biology**, *Comparative methods in phylogenetic networks*.
- 2018 **SACNAS – Data Science: The Rise of the Machines**, *Identifying genes associated with disease*.
- 2018 **SACNAS – Postdoc talks**, *Machine-learning the Tree of Life*.
- 2018 **20th IMS New Researchers Conference**, *Statistical inference of the Tree of Life*.
- 2016 **8th Mexican Conference on Pattern Recognition – Guanajuato, Mexico**, *Crime detection via crowdsourcing*.
- 2015 **Evolutionary System Biology and Modeling Workshop – UW Madison**, *Statistical inference of phylogenetic networks*.
- 2015 **JSM – Bayesian Models and Inference**, *Bayesian species delimitation combining multiple genes and traits in a unified framework*.
- 2015 **Mathematical and Computational Evolutionary Biology Conference**, *Inferring phylogenetic networks from quartets with maximum pseudolikelihood estimation*.
- 2009 **XXIV Foro Nacional de Estadística**, *A parametric measure of dispersion derived from the generalized mean*.

## Service

### University

- 2024 **Reviewer of Sophomore Undergraduate Research Fellowships**.
- 2023–2024 **Graduate admissions committee**, *Department of Plant Pathology*.
- 2024 **Data in Action Research Bazaar**, *Co-organizer of the Collaboration Matching Exercise: Want to find your match?*, Co-organizer: Michael Ferris.
- 2023 **MANRRS Women in STEM panel**, *Invited faculty*.
- 2023 **Research Forward committee**.
- 2023 **Biological Interactions Mentoring Program**, *Invited speaker*, Biological Data Science.
- 2023 **WID Research Bazaar**, *Co-organizer of the Collaboration Matching Exercise: Want to find your match?*, Co-organizer: Michael Ferris.
- 2022 **MOSAIC mentor**, *Lauren English*.
- 2022 **Pre-awards recruitment committee**, *WID*.
- 2022 **Creator of Latinx UW-Madison Faculty group**.
- 2022 **Reviewer for Research Forward 2**.
- 2021 **Pre-award recruitment committee**, *WID*.
- 2021 **A-JEDI committee**, *WID*.

- 2021 **Biological Interactions Mentoring Program**, *Summer mentor of Kaitilyn Abshire (CUNY).*
- 2020 **Whiteness in STEM Discussions**, *WID.*
- 2020 **Anti-racist working group**, *WID.*
- 2020–2021 **Phylogenomics bookclub**, *Organizer.*
- 2020 **Meet and Greet**, *with students of color, first generation students, students with varying abilities, or students from low-income backgrounds*, Division of Diversity, Equity and Educational Achievement.
- 2020 **Women in Science and Engineering (WISE) Learning Community**, *Faculty Guest.*
- 2020 **SciMed GRS Poster Session**, *Judge*, (cancelled due to COVID).
- 2020–present **Justice, Equity, Diversity and Inclusion (JEDI) committee**, *Chair.*
- 2020–present **PSGSC Plant Sciences Graduate Student Council**, *Invited to mentor students of color.*
- 2019 **International Year of Plant Health committee**, *Department of Plant Pathology*, (activities canceled due to COVID).
- 2019–2020 **Graduate admissions committee**, *Department of Plant Pathology.*
- Editorial
- 2024 **75th anniversary of Systematic Biology**, *Invited “Evolving views” article on phylogenetic networks.*
- 2024 **PNAS special issue Speciation-Introgression-Conservation**, *Invited review article on phylogenetic networks*, (co-author: George Tiley).
- 2023–2024 **Co-editor Special Edition**, *Seeing the web for the tree: advances in reticulate evolution*, *Bulletin of Society of Systematic Biology*, (co-editor: George Tiley).
- 2023–present **Journal of Agricultural, Biological and Environmental Statistics**, *Associate Editor.*
- 2023–present **Journal of Open Source Software**, *Associate Editor.*
- 2021–present **Frontiers in Ecology and Evolution - Phylogenetics, Phylogenomics, and Systematics**, *Review Editor.*
- 2019–present **Systematic Biology**, *Associate Editor.*
- 2016–present **Systematic Biology**, *Editorial Board Member.*
- Reviewer:**, *Syst Bio, MBE, Bioinformatics, Genetics, eLIFE, Evolution, PLoS Comp Bio, Bulletin of Math Bio, Nature Methods, JOMB, BSSB, ISMB, Nature Microbiology, Science.*
- Conferences, Symposia, Workshops
- 2024 **Methods for Biological Data Workshop Series**, *Department of Plant Pathology, UW-Madison*, Co-organizer with Emile Gluck-Thaler.
- 2023 **Botany Meeting Symposium**, *Seeing the network for the trees: novel methods in phylogenetic networks*, Co-organizer: George Tiley.
- 2021 **Evolution Meeting**, *Bilingual Mentoring Program.*
- 2020 **Systematic Biology Meeting**, *Coalescent-based methods in the age of big data.*
- 2020 **Future of Systematics Invited Session**, *SSB-Standalone Meeting.*
- 2020–present **El Zoominario**, *Short scientific talks to increase visibility of Latinx in STEM*, Co-organizer: Daniel Pimentel-Alarcon.
- 2018 **SACNAS Symposium**, *Data Science: The Rise of the Machines*, Co-organizer: Daniel Pimentel-Alarcón.
- 2016 **Evolution Meeting Symposium**, *Advances in the analysis of reticulate population networks*, Co-organizer: David Baum.
- Grant panels
- 2022 **Dutch Research Council**, *Grant review.*
- 2022 **NSF**, *Grants review panel (Summer).*
- 2022 **NSF**, *Grants review panel (April).*
- 2022 **DOE**, *Grants review panel (Summer).*
- 2022 **DOE**, *Grants review panel (April).*

- 2021 **NSF**, *Grants review panel*.
- 2020 **NIH NHGRI Genomics**, *Strategic Planning Finale Meeting*.
- 2020 **DOE**, *Grants review panel*.

#### Outreach and Public Engagement

- 2024 **Guest lecture: Statistics in Forensics 101**, *Forensic Justice Institute*.
- 2023 **Celebrating Latinx voices in STEM Symposium**, *UW-Madison*, organizer of the event with the support of WID and CALS.
- 2023 **Crossroads of ideas: Comparing the Creative Process in Science and Art**, *WI Science Fest and WI Book Fest*.
- 2023 **Uncontrolled Variables**, *Invited speaker at the comedy show about scientific presentations*.
- 2023 **Technical to Beautiful: Data as Art Exhibition**, *UW-Madison*, Co-organizer: Kris Sankaran.
- 2023 **Guest lecture: Statistics in Forensics 101**, *DNA Bootcamp 2023 by California State University Los Angeles, Los Angeles Innocence Project, Federal Defender Central District of California, and Los Angeles County Public Defender*.
- 2023 **Women in STEM – UNAM**, *De las mates a las plantas: mi camino en ciencia*.
- 2023 **Latino Youth Summit**, *From math to plants: my winding path in science*.
- 2023 **Girls Who Code**, *What is a statistician doing in Plant Pathology?*.
- 2022 **Dreamers of Wisconsin Mentoring Program Kickoff Event**, *UW-Madison School of Education*, Invited speaker.
- 2022 **Guest lecture: Statistics in Forensics 101**, *National Forensic College*.
- 2022 **Guest lecture: Basics of statistics for defense attorneys**, *Forensic University*, (WI public defenders).
- 2022 **Virtual Science Event**, *Data Decoders*, Mauston High School.
- 2022 **Día Internacional de la Mujer y la Niña en la Ciencia**, *Universidad Anahuac*, Invited speaker.
- 2021 **WI Science Festival: Stumble into Science**, *UW-Madison*.
- 2021 **WI Science Festival: Stumble into Science**, *UW-Madison*, Science talk at Delta Beer Lab.
- 2020 **SACNAS Women in Science Forum**, *UW-Madison*, (cancelled due to COVID).
- 2020 **Cientifico Latino mentoring program**.
- 2020 **Latina in Science presentation**, *Universidad Nacional de Colombia*.
- 2019 **Atlanta Science Festival**, *Complete the circuit: meet a woman scientist*.
- 2018 **Career Day**, *Bridge the diversity gap in science*, Campbell Middle School.
- 2005-2008 **Sistema de preparatoria abierta para adultos**, *ITAM*, Math high-school teacher for adults, Mexico.

#### Societies

- 2021–2024 **Society of Systematic Biologists**, *Elected Council Member*.
- 2022 **American Statistical Association**, *Creator of LatinxInStat database*.
- Member**, *Society of Systematic Biologists, American Statistical Association, SACNAS*.

#### Media

- 2024 Faculty Spotlight *Madison Chapter of Graduate Women in Science (GWIS-Beta Chapter)*
- 2023 There are no bugs in winter *Zero budget sci-fi movie screening*
- 2023 Faces of Data Science: Claudia Solis-Lemus *Data Science at UW*
- 2023 El Zoominario: giving a voice to Latinx scientists and inspiring the next generation *CGSI Newsletter*
- 2022 "Behind the scientist" *Interview for WID Kohler fellowship*
- 2022 Wisconsin Latinx History Collective (WLHP) *Interview with Tess Arenas*
- 2021 En Nuestro Patio Radio Interview on diversity in STEM *WORT FM*
- 2021 Meet the Lab: Data Decoders *PBS*
- 2021 Invited publication about me *Mujeres Haciendo Ciencia @mujeres.haciendo.ciencia*
- 2021 Rotating Curator of Twitter @WomenInStat in Sept 13-17 *American Statistical Association (ASA)*

2021 "The Tree of Life is rooted in Math" article  
2021 WID Women's history month  
2020 Code conversations with Casey Dunn  
2020 "The flip of a coin" article

*GROW Magazine*  
*YouTube video*  
*YouTube interview*  
*Badger Vibes stories*

## Computer skills

Programming C++, Java, Julia, Perl, Python  
Statistics R, SAS, SPSS  
Mathematics Matlab, Mathematica, Macaulay2  
HTC HTCondor, OSG, SLURM

## Certifications

Exam C Society of Actuaries (SOA) *Construction of Actuarial Models Certificate*  
Exam FM Society of Actuaries (SOA) *Financial Mathematics Certificate*  
Exam P Society of Actuaries (SOA) *Probability Certificate*

## Languages

Spanish Native language  
English Proficient level: TOEFL iBT (2009), IELTS (2009)  
French Advanced level: DALF C1 (2007)  
Portuguese Advanced level: CELPE-BRAS (2008)  
German Beginner level: A1 Start Deutsch 1 (2008)

Last updated: July 6, 2024