

Contact Information

Juan B. Gutiérrez, Ph.D.
Professor, Department of Mathematics
Flawn Science Building 4.01.32
The University of Texas at San Antonio
1 UTSA Circle, San Antonio, Texas 78249
+1 (210) 458-5735

juan.gutierrez3@utsa.edu
ORCID: [0000-0002-0627-5035](https://orcid.org/0000-0002-0627-5035)
LinkedIn: [biomathematicus](https://www.linkedin.com/in/biomathematicus)
GitHub: [biomathematicus](https://github.com/biomathematicus)
<https://biomathematicus.me>

Credentials

- **9/2010 - 7/2012.** Postdoc, [Math. Biosci. Inst.](#), Ohio State University, Columbus, OH.
- **9/2009 - 8/2010.** Postdoc, [Inst. for Theor. and Math. Ecology](#), U of Miami, Coral Gables, FL.
- **12/2009.** Ph.D. in Mathematics. [Department of Mathematics](#), FSU, Tallahassee, Florida.
- **05/2005.** M.Sc. in Mathematics. [Department of Mathematics](#), FSU, Tallahassee, Florida.
- **05/1996.** Civil Engineer, [Department of Civil Engineering](#), Universidad Nacional de Colombia. .

Academic Appointments

- Chair of the [Department of Mathematics](#), University of Texas at San Antonio, August 2019 to 2025.
- Professor of Mathematics, University of Texas at San Antonio, August 2019.
- Adjunct Associate Professor of Mathematics, [Department of Mathematics](#), University of Georgia, Athens, Georgia. August 2019 to July 2024.
- Interim director of the [Latin American and Caribbean Studies Institute](#), University of Georgia, Athens, Georgia. Dec 2017-Jun, 2018.
- Associate Professor of [Mathematics](#) and [Bioinformatics](#), University of Georgia, Athens, Georgia. August 2016 to July 2019.
- Adjunct Associate Professor of [Computer Science](#), University of Georgia, Athens, Georgia. August 2017 to July 2019.
- Assistant Professor of [Mathematics](#) and [Bioinformatics](#), University of Georgia, Athens, Georgia. August 2012 to July 2016.

Sponsored Projects (11)

1. NSF. [Supporting Student Learning and Success in Early Undergraduate Mathematics Courses via AI-Enhanced Education](#) (2026-2028, \$374,000). PI.
2. NIH NIGMS. [Training Biomedical Research Teams for Rigor and Reproducibility in Data Science](#) (2023-2028, \$450,000 UTSA out of \$2.5M multi-institutional award). Joint PI.
3. NSF. [ALICE \(Adaptive Learning for Interdisciplinary Learning Environments\)](#), (2016-2019, \$299,000), NSF award #1645325. PI
4. DARPA. [Technologies for Host Resilience](#) (2016-2019, \$1,573,674 UGA out of \$6.5M multi-institutional award) - Host Acute Models of Malaria to study Experimental Resilience (THoR's HAMMER), [DARPA contract #W911NF-16-C-0008](#). Co-PI
5. NSF. [Collaborative Research: NSF INCLUDES: An Integrated Approach to Retain Underrepresented Minority Students in STEM Disciplines](#) (2016-2019, \$117K). NSF award 1649226. Co-PI

6. NIH NIAID. [Malaria Host-Pathogen Interaction Center](#) (MaHPIC - 2012-2017, \$19.5M) NIH's NIAID contract HHSN272201200031C. Co-I.
7. NIH NIAID. [International Centers for Excellence in Malaria Research - Center for non-Amazonian regions of Latin America](#) (2012-2017, \$159K for UGA out of \$5.5M) - CLAIM, NIAID cooperative agreement U19AI089702-01, 2010-2017. PI of sub-award
8. Florida Department of Agriculture, Division of Aquaculture. Modeling dispersal of invasive snail species in Florida. 2008, \$2,500. PI.
9. Spanish Ministry of Industry. DISCOVER-LIT. Sub-award from contract TSI-070300-2008-67. 2008-2009, \$100K sub-award out of a \$300K research contract. PI of subaward.
10. IDCT. *Contravía* (Counterway). Award # IDCT-410/1998 by the *Instituto Distrital de Cultura y Turismo* (Institute of Culture and Tourism of the City of Bogota) 1998-1999, \$12K. PI.
11. IDCT. *Condiciones Extremas* (Extreme Conditions). Award # IDCT-514/1997 by the *Instituto Distrital de Cultura y Turismo* (Institute of Culture and Tourism of the City of Bogota) *textit*Condiciones Extremas. 1997-1998, \$30K. PI.
12. Colcultura. *El Primer Vuelo de los Hermanos Wright* (The First Flight of the Wright Brothers). Award # Colcultura-SECAB 014/1996 by the *Instituto Colombiano de Cultura - Colcultura, now the Ministry of Culture* (Colombian Institute of Culture, now the Ministry of Culture) 1996-1998, \$8K. PI.

Publications (37)

- 2025 “*Orthogonal Activation Functions in Neural Networks: Utilizing Chebyshev, Legendre, and Hermite Polynomials*”. In: Arabnia, H.R., Ferens, K., Deligiannidis, L. (eds) *Applied Cognitive Computing and Artificial Intelligence*. CSCE 2024. Communications in Computer and Information Science, vol 2251, pp 284-300. DOI: [10.1007/978-3-031-85628-0_21](https://doi.org/10.1007/978-3-031-85628-0_21).
- 2022 “*MaHPIC malaria systems biology data from Plasmodium cynomolgi sporozoite longitudinal infections in macaques*.” *Nature Scientific Data*. 9, 722 (2022). DOI: [10.1038/s41597-022-01755-y](https://doi.org/10.1038/s41597-022-01755-y)
- 2022 “*Plasmodium knowlesi* cytoadhesion involves SICA variant proteins.” *Frontiers in Cellular and Infection Microbiology* (2022): 617. DOI: [10.3389/fcimb.2022.888496](https://doi.org/10.3389/fcimb.2022.888496)
- 2021 “Clinical recovery of *Macaca fascicularis* infected with *Plasmodium knowlesi*”. *Malaria Journal*, 20(1), pp.1-20. DOI: [10.1186/s12936-021-03925-6](https://doi.org/10.1186/s12936-021-03925-6).
- 2020 “An Epidemiological Model of Malaria Accounting for Asymptomatic Carriers.” *Bulletin of Mathematical Biology* 82, 42 (2020). DOI: [10.1007/s11538-020-00717-y](https://doi.org/10.1007/s11538-020-00717-y)
- 2020 “*Practical Recommendations for Supporting a Systems Biology Cyberinfrastructure*.” *Data Science Journal*, 19(1), 24. DOI: [10.5334/dsj-2020-024](https://doi.org/10.5334/dsj-2020-024)
- 2020 “*In silico* identification of potential inhibitors against human 2'-5'- oligoadenylate synthetase (OAS) proteins.” *Computational Biology and Chemistry*, Volume 85, April 2020, 107211. DOI: [10.1016/j.compbiolchem.2020.107211](https://doi.org/10.1016/j.compbiolchem.2020.107211).
- 2019 “*Multi-scale dynamics of infectious diseases*.” *Interface Focus* 10: 20190118, Royal Society. DOI: [10.1098/rsfs.2019.0118](https://doi.org/10.1098/rsfs.2019.0118).
- 2019 “*The FRiND Model: A Mathematical Model for Representing Macrophage Plasticity in Muscular Dystrophy Pathogenesis*.” *Bulletin of Mathematical Biology*. Volume 81, pages 3976-3997. DOI: [10.1007/s11538-019-00635-8doi](https://doi.org/10.1007/s11538-019-00635-8doi)
- 2018 “*A Review of Mathematical Models for Muscular Dystrophy: A Systems Biology Approach*.” *PLOS Currents Muscular Dystrophy*. 2018-2-16. DOI: [10.1371/currents.md.6af74d0cec0834554dac78f0045cfded](https://doi.org/10.1371/currents.md.6af74d0cec0834554dac78f0045cfded).

- 2017 PROCEEDINGS. “*A comprehensive investigation and comparison of Machine Learning Techniques in the domain of heart disease.*” In Computers and Communications (ISCC), 2017 IEEE Symposium on, pp. 204-207. IEEE, 2017. DOI: [10.1109/ISCC.2017.8024530](https://doi.org/10.1109/ISCC.2017.8024530)
- 2017 “*Malaria epidemiology in low-endemicity areas of the northern coast of Ecuador: high prevalence of asymptomatic infections.*” Malaria journal 16, no. 1 (2017):300. DOI: [10.1186/s12936-017-1947-0](https://doi.org/10.1186/s12936-017-1947-0)
- 2017 PROCEEDINGS. “*Reviving Computer Science Education through Adaptive, Interest-Based Learning.*” In 2017 International Conference on Computational Science and Computational Intelligence (CSCI), pp. 1161-1166. IEEE, 2017. DOI: [10.1109/CSCI.2017.202](https://doi.org/10.1109/CSCI.2017.202)
- 2017 PROCEEDINGS. “*Towards Interest-based Adaptive Learning and Community Knowledge Sharing.*” International Conference Frontiers in Education: CS and CE. FECS'17. CSREA Press, 2017, pp 58-61. <https://csce.ucmss.com/cr/books/2017/LFS/CSREA2017/FEC3527.pdf>
- 2017 CHAPTER. “*Establishment of the Vertebrate Germ Layers.*” In: Pelegri F., Danilchik M., Sutherland A. (eds) Vertebrate Development, pp. 307-381. Springer, 2017. DOI: [10.1007/978-3-319-46095-6_7](https://doi.org/10.1007/978-3-319-46095-6_7)
- 2017 PROCEEDINGS. “*Text Summarization Techniques: A Brief Survey.*” (IJACSA) International Journal of Advanced Computer Science and Applications, Vol. 8, No. 10, 2017. <http://...Volume8No10-Paper-52.pdf>.
- 2016 PROCEEDINGS. “*Making CS inclusive: An overview of efforts to expand and diversify cs education.*” In Computational Science and Computational Intelligence (CSCI), 2016 International Conference on, pp. 321-326. IEEE, 2016. DOI: [10.1109/CSCI.2016.0067](https://doi.org/10.1109/CSCI.2016.0067)
- 2015 “*Mathematical model of susceptibility, resistance, and resilience in the within-host dynamics between a Plasmodium parasite and the immune system.*” Mathematical Biosciences. Volume 270, Part B, December 2015, Pages 213-223. DOI: [10.1016/j.mbs.2015.10.003](https://doi.org/10.1016/j.mbs.2015.10.003)
- 2015 “*Clinical profile of Plasmodium falciparum and Plasmodium vivax infections in low and unstable malaria transmission settings of Colombia.*” Malaria Journal 2015, 14:154. DOI: [10.1186/s12936-015-0678-3](https://doi.org/10.1186/s12936-015-0678-3)
- 2015 “*Bivariate Spline Solution of Time Dependent Nonlinear PDE for a Population Density over Irregular Domains.*” Mathematical Biosciences. Volume 270, Part B, December 2015, Pages 263-277. DOI: [10.1016/j.mbs.2015.08.013](https://doi.org/10.1016/j.mbs.2015.08.013)
- 2015 “*From Within Host Dynamics to the Epidemiology of Infectious Disease: Scientific Overview and Challenges.*” Mathematical Biosciences. Volume 270, Part B, December 2015, Pages 143-155. DOI: [10.1016/j.mbs.2015.10.002](https://doi.org/10.1016/j.mbs.2015.10.002)
- 2015 “*A Framework for Global Collaborative Data Management in Malaria Research.*” Am J Trop Med Hyg. 2015 Sep 2; 93(3 Suppl): 124-132. DOI: [10.4269/ajtmh.15-0003](https://doi.org/10.4269/ajtmh.15-0003)
- 2015 “*Malaria-Related anemia in patients from unstable transmission areas in Colombia.*” Am J Trop Med Hyg. 2015 Feb 4;92(2):294-301. DOI: [10.4269/ajtmh.14-0345](https://doi.org/10.4269/ajtmh.14-0345)
- 2014 “*Knowledge attitudes and practices on malaria in Colombia.*” Malaria Journal 2014, 13:165. DOI: [10.1186/1475-2875-13-165](https://doi.org/10.1186/1475-2875-13-165)
- 2013 “*Global existence and asymptotic behavior of a model for biological control of invasive species via supermale introduction.*” Communications in Mathematical Sciences. 11(4):971-992. DOI: [10.4310/CMS.2013.v11.n4.a4](https://doi.org/10.4310/CMS.2013.v11.n4.a4)
- 2013 “*Combining the Trojan Y Chromosome and Daughterless Carp Eradication Strategies.*” Biological Invasions, May 2013. DOI: [10.1007/s10530-013-0476-1](https://doi.org/10.1007/s10530-013-0476-1).
- 2013 “*A Comparison of the Trojan Y Chromosome and Daughterless Carp Eradication Strategies.*” Biological Invasions, May 2013. DOI: [10.1007/s10530-013-0475-2](https://doi.org/10.1007/s10530-013-0475-2).

- 2012 “*Prospects for malaria elimination in non-Amazonian regions of Latin America.*” *Acta Tropica*. Volume 121, issue 3 (March, 2012), p. 315-323. DOI: [10.1016/j.actatropica.2011.06.018](https://doi.org/10.1016/j.actatropica.2011.06.018).
- 2012 “*Analysis of the Trojan Y Chromosome Model for Eradication of Invasive Species in a Riverine System.*” *Journal of Mathematical Biology*. Volume 64, Numbers 1-2 (2012), 319-340. DOI: [10.1007/s00285-011-0413-9](https://doi.org/10.1007/s00285-011-0413-9).
- 2011 CHAPTER. “*A theoretical strategy for eradication of Asian carps using a Trojan Y chromosome to shift the sex ratio of the population.*” In Duane C. Chapman, editor, *Bigheaded Carps in North America*. Published by the American Fisheries Society, AFS Symposium 74, Bethesda, MD, 2011. ISBN: 978-1-934874-23-3. .
- 2010 “*On the Well Posedness of the Trojan Y Chromosome Model.*” *Boundary Value Problems*, vol. 2010, Article ID 405816, Nov. 2010. DOI: [10.1155/2010/405816](https://doi.org/10.1155/2010/405816).
- 2010 “*On the Global Attractor of the Trojan Y Chromosome Model.*” *Communications in Pure and Applied Analysis*, 10(10):339-359, January 2010. DOI: [10.3934/cpaa.2011.10.339](https://doi.org/10.3934/cpaa.2011.10.339).
- 2008 “*Shape analysis for automated sulcal classification and parcellation of MRI data.*” *Journal of Combinatorial Optimization*, 15(3):257–275, 2008. DOI: [10.1007/s10878-007-9096-y](https://doi.org/10.1007/s10878-007-9096-y).
- 2008 PROCEEDINGS. “*Geometric invariants for classification of cortical sulci.*” In *IEEE International Conference on Image Processing*. IEEE, pages 1156–1159, San Diego, CA, October 2008. DOI: [10.1109/ICIP.2008.4711965](https://doi.org/10.1109/ICIP.2008.4711965).
- 2008 PROCEEDINGS. “*Literatronica. Adaptive Digital Narrative.*” In ACM’s Hypertext’08. Creating ’08: Proceedings of the hypertext 2008 workshop on Creating out of the machine: hypertext, hypermedia, and web artists explore the craft, pages 5-8, New York, NY, USA. DOI: [10.1145/1379153.1379156](https://doi.org/10.1145/1379153.1379156).
- 2006 “*A model describing the effect of sex-reversed YY fish in an established wild population: the use of a Trojan Y chromosome to cause extinction of an introduced exotic species.*” *Journal of Theoretical Biology*, 241(22):333–341, July 2006. DOI: [10.1016/j.jtbi.2005.11.032](https://doi.org/10.1016/j.jtbi.2005.11.032).

Preprints(10)

- 2025 A Mathematical Theory of Discursive Networks. [arXiv:2507.06565](https://arxiv.org/abs/2507.06565) [cs.CL]
- 2024 Data rectification to account for delays in reporting disease incidence with an application to forecasting COVID-19 cases. DOI: [10.1101/2024.04.08.24305398](https://doi.org/10.1101/2024.04.08.24305398)
- 2020 A Model Describing COVID-19 Community Transmission Taking into Account Asymptomatic Carriers and Risk Mitigation. DOI: [10.1101/2020.03.18.20037994](https://doi.org/10.1101/2020.03.18.20037994)
- 2017 Considerations on Interdisciplinary Instruction and Design Influenced by Adaptive Learning. A Case Study Involving Biology, Computer Science, Mathematics, and Statistics. [arXiv:1703.06010](https://arxiv.org/abs/1703.06010).
- 2017 A Brief Survey of Text Mining: Classification, Clustering and Extraction Techniques. [arXiv:1707.02919](https://arxiv.org/abs/1707.02919).
- 2017 A Vision for Health Informatics: Introducing the SKED Framework. An Extensible Architecture for Scientific Knowledge Extraction from Data. [arXiv:1706.07992](https://arxiv.org/abs/1706.07992).
- 2017 Correlates of severity of disease in *Macaca mulatta* infected with *Plasmodium cynomolgi*. [arXiv:1706.08836](https://arxiv.org/abs/1706.08836).
- 2017 The lunar cycle’s influence on sex determination at conception in humans. [arXiv:1706.08151](https://arxiv.org/abs/1706.08151) .
- 2017 Quantification of Healthy Red Blood Cell Removal and Preferential Invasion of Reticulocytes in *Macaca mulatta* during *Plasmodium cynomolgi* Infection. [arXiv:1706.08139](https://arxiv.org/abs/1706.08139).
- 2016 A Method for Massively Parallel Analysis of Time Series. [arXiv:1612.08759](https://arxiv.org/abs/1612.08759).

Graduate Students (4 M.Sc., 8 Ph.D.)

- 2024 UTSA. Khanh Ho. Masters of Science in Mathematics Education.
- 2022 UTSA. Samuel Roberts. Masters of Science in Mathematics.
- 2019 UGA. Jessica A. Brady. Ph.D. in Engineering. *Mathematical modeling in health and disease.*
- 2019 UGA. Zerotti Woods. Ph.D. in Mathematics. *A new regularization term for deep neural networks with applications to biological data.*
- 2019 UGA. Tao Sheng. Ph.D. in Bioinformatics. *Integration of transcriptomic and high frequency telemetry data via machine learning methods.*
- 2019 UGA. Diego M. Moncada-Giraldo. Masters of Science in Bioinformatics.
- 2018 UGA. Valerie N. Flint. Ph.D. in Bioinformatics. *Shield: SNV heuristic identification, exploration, and location detector.*
- 2018 UGA. Matthew T. Houston. Ph.D. in Mathematics. *The FRiND model: a mathematical model for representing immunological interactions in muscular dystrophy pathogenesis.*
- 2018 UGA. Elizabeth D. Trippe. Ph.D. in Bioinformatics. *Data Integration for Systems Biology.*
- 2018 UGA. Bolanle O. Salaam. Masters of Science in Applied Mathematical Sciences.
- 2017 UGA. Karen E. Aguar, Ph.D. in Computer Science. *SAIL: A system for adaptive interest-based learning in STEM education.*
- 2017 UGA. Yi H. Yan, Ph.D. in Bioinformatics. *Multi-Omic and multi-scale data integration for the characterization of malaria infection in non-human primates.*

Editorial Service & Professional Societies

- Editorial Board of Mathematical Biosciences (Elsevier), 2012-2023.
- Editorial Board of Mathematics (MDPI), 2020-Present.
- Member of the American mathematical Society (AMS).
- Member of the Society for Mathematical Biology (SMB).
- Member of the Society for Industrial and Applied Mathematics (SIAM).

Prizes and Awards

- 2023 *Academia de Liderazgo*. Hispanic Association of Colleges and Universities (HACU).
- 2023 *Best Visualization*. Academic Data Science Alliance Annual Meeting, San Antonio, TX.
- 2021 Diversity, Equity and Inclusion Award. Oak Ridge National Lab. 2021 Meeting Soc. Math. Bio.
- 2011 *Summer Leadership Institute*. SACNAS.
- 1998 Civic Medal of the City of Bogota. Decree 504, August 4, 1999.
- 1996 First Prize. Excellence in Engineering Thesis, November 28, 1996. Awarded by the Society of Civil Engineers, AICUN. Bogota, Colombia.
- 1996 First Prize. International Literary Contest Carlos Casto Saavedra, Medellin, Colombia.
- 1995 Winner of the International Literary Award 'Ko'eyú Latinoamericano', 1995, Caracas, Venezuela.