

Brayan Gutierrez
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EDUCATION

Master's in Statistics: (Fall 2025 – Fall 2026)

Rice University, Houston, Texas

Bachelor of Science in Mathematics – Data Science Option, Magna cum laude: (Fall 2021 – Spring 2024)

University of Houston, Houston, Texas

Final GPA: 3.77

Honors Associate of Science Degree, Magna cum laude: (Fall 2019 – Spring 2021)

Lone Star College-CyFair, Cypress, Texas

Final GPA: 3.80

High School Diploma, Magna cum laude: (Spring 2019)

Cypress Falls High School, Cypress, Texas

RESEARCH EXPERIENCE

Transcriptomic Deconvolution and Multi-Omic Method Development in Cancer Genomics with Dr. Wenyi Wang, MD Anderson Cancer Center Graduate Research Assistant, (Fall 2026 – Present)

- Developing and applying transcriptomic deconvolution methods to resolve cell-type composition from bulk RNA-seq data in cancer genomics.
- Reviewing and benchmarking existing cell-type deconvolution approaches, including Xu et al. 2025, to inform methodological direction.
- Corresponding with collaborators at DFCI, NCI, and MIT on data availability, including germline data access via dbGaP, for a multi-institution cancer genomics compendium project.
- Contributing to multi-omic data integration efforts within the lab's broader computational cancer bioinformatics research program.

3D Point Cloud Deep Learning for Fossil Teeth and Skeletal Classification with Manuel and Dr. Judy Wang, Rice University Collaborative Research, (Fall 2026 - Present)

- Applying 3D point cloud deep learning architectures, prioritizing PointMLP, PointNeXt, and Point Transformer over baseline models like PointNet++ and DGCNN, to classify fossil teeth and skeletal scans.
- Reviewing prior computer vision approaches to taphonomy, including Dominguez-Rodrigo et al.'s 2D CNN ensemble methods, to inform model architecture and design choices.
- Benchmarking the project's novelty against existing 3D fossil classification work, such as Doubabi et al. 2025, to identify methodological gaps.

EV-OMICS: Multi-Omics Profiling of Extracellular Vesicles for Early-Stage Predictive Diagnostics, Rice University / MD Anderson Collaborative Research, (Summer 2026 - Present)

- Contributing to multi-omic profiling of extracellular vesicles (EVs) toward the development of early-stage predictive diagnostic biomarkers.
- Supervising and mentoring a research assistant on the project's experimental and analytical workflows.
- Preparing lab meeting presentations to communicate project design and progress to collaborators.

Fishing for the Genetic and Developmental Mechanisms Underlying Skeletal Heterochrony in the Evolution of Cypriniform Fishes with Sara Loetzerich and Dr. Jake Daane, University of Houston Volunteer Research, (Summer 2026 – Fall 2026)

- Investigating the genetic and developmental basis of skeletal heterochrony (shifts in the timing of skeletal development) across Cypriniform fishes, using *Danio rerio* (zebrafish) and *Danionella cerebrum* as model species.

- Applying comparative genomics and bioinformatics approaches to identify candidate genes and regulatory elements associated with heterochronic shifts in skeletal ossification and morphology.
- Conducting traditional molecular assays (e.g., in situ hybridization, PCR-based genotyping) to validate candidate gene expression patterns during skeletal development.
- Integrating comparative developmental data across species to reconstruct the evolutionary trajectory of skeletal timing changes within Cypriniformes.

Robust Clustering Analysis of Genes Related to Age-related Macular Degeneration using RNA-seq, Rice University Graduate Research (Fall 2025 – Fall 2026)

- Optimizing the MEGENA (Multiscale Embedded Gene Co-expression Network Analysis) pipeline to leverage AMD's ROCm and GPU/CPU architecture for massive-scale gene expression data.
- Implementing parallel processing and memory management techniques to substantially improve the efficiency of network construction and multi-scale clustering.
- Analyzing co-expression modules to identify novel biomarkers and key genetic regulators associated with the pathogenesis of Age-related Macular Degeneration (AMD).
- Wrote custom scripts and R code for downstream statistical validation and visualization of network results, connecting modules to known AMD genetic risk loci.

Parallel reduction in skeletal density during benthic to pelagic transitions in Baikal sculpins with Dr. Jake Daane, University of Houston Baccalaureate and Post-Baccalaureate Research (Spring 2024 - Fall 2025)

- Characterizing patterns of skeletal density variation across the phylogeny of Baikal sculpins
- Rendering and processing μ CT scans of fish skeletons using Thermo Fisher's Amira software and collecting bone/tissue mineral density data using data science and statistical techniques
- <https://github.com/Brayan695/Parallel-reduction-in-skeletal-density-during-benthic-to-pelagic-transitions-in-Baikal-sculpins>

Stochastic Newton-MCMC for Bayesian Inference with Dr. Andrea Mang, University of Houston Summer Undergraduate Research Fellowship (Summer 2023)

- Implemented many Markov Chain Monte Carlo Algorithms, such as Metropolis Hastings, Hamiltonian, and Stochastic-Newton, into Python and observed how they worked on different gaussian probability distributions
- Used the above algorithms on Bayesian Inference Problems to find a certain problem's initial parameters

Dihedral Scan of Butane and Chloropropane, RICE Tapia/MolSSI Computational Chemistry Workshop (Summer 2020)

- Computationally rotated a methyl in a Butane molecule and a chlorine in a Chloropropane molecule with the use of Python/Jupyter Notebook
- Observed and gained an understanding on how the Intramolecular Potential Energy Surface of a molecule changed depending on its dihedral angles

PUBLICATIONS

Parallel Reduction in Skeletal Density during Benthic to Pelagic Transitions in Baikal Sculpins

- *Integrative Organismal Biology (IOB)*
- **Authors:** Brayan A. Gutierrez, Olivier Larouche, Sara Loetzerich, Mackenzie E. Gerringer, Kory M. Evans, Andres Aguilar, Sergei Kirilchik, Michael W. Sandel, Jacob M. Daane
- **Link:** <https://academic.oup.com/iob/article/8/1/obag026/8702922>

CONFERENCE PUBLICATIONS

Robust Clustering Analysis of Genes Related to Age-related Macular Degeneration using RNA-seq

- *IEEE International Conference on Healthcare Informatics (ICHI) 2026*
- **Authors:** Brayan Gutierrez, Rinki Ratnapriya, Arko Barman
- **Link:** <https://drive.google.com/file/d/18GsLjz6lyzjKJdw7pQOD6QshtYhXKtaE/view?usp=sharing>

PRESENTATIONS

“Robust Clustering Analysis of Genes Related to Age-related Macular Degeneration using RNA-seq.” IEEE International Conference on Healthcare Informatics, Oral Presentation (June 3rd, 2026), Rice University
Ken Kennedy AI in Health Conference, Poster Presentation (September 16th, 2026)

“Stochastic Newton-MCMC for Bayesian Inference.” National Diversity in STEM [NDiSTEM] Conference, Poster Presentation (October 26th, 2023), University of Houston Undergraduate Research Day, Poster Presentation (April 11th, 2024)

“Greco-Roman Medicine and Beliefs: The Influence of Cancer and The Humoral Theory.” Great Plains Honors Conference, Oral Presentation (Virtual) (March 12, 2021)

ADDITIONAL TRAINING

Statistical Inference, Johns Hopkins University (Coursera), Jun 2026

Topics: probability, common distributions, asymptotics and the CLT, estimation, confidence intervals, hypothesis testing.

Credential: coursera.org/verify/VBUSB8T66WW3

HONORS RESEARCH PROJECTS

“Greco-Roman Medicine and Beliefs: The Influence of Cancer and The Humoral Theory.” Honors Introduction to Archeology 2302, Lone Star College CyFair, Cypress, Texas, (Fall 2020)

“LGBTQ Awareness: Exploring the Transgender Healthcare Experience.” Honors Public Speaking 1315, Lone Star College CyFair, Cypress, Texas (Spring 2020)

“Identity and Childhood Cancer: The Influence Cancer has on The Child’s Personal Identity.” Honors English and Philosophy 1301, Lone Star College CyFair, Cypress, Texas (Fall 2019)

LEADERSHIP

American Statistical Association (ASA) Rice Chapter Founding Co-Treasurer (Fall 2025 - Present)

Managed chapter finances through event budgeting, fundraising via partnerships with companies within the greater Houston area, and through the authorship of grants submitted to UH to fund several programs ran by the organization.

Society for Advancement of Chicanos/Hispanics & Native Americans in Science (SACNAS UH)

Undergraduate Fundraising Officer (Fall 2022 – Fall 2023)

Aided in the management of a diverse community composed of over 300 undergraduate students, graduate students, professionals, technicians, and academics.

Managed chapter finances through event budgeting, fundraising via partnerships with companies within the greater Houston area, and through the authorship of grants submitted to UH to fund several programs ran by the organization.

Assisted in the planning of cultural and professional development events with a team of undergraduate and graduate student officers from varying STEM disciplines.

Received a Chapter Best Practices award in Outstanding STEM Diversity from the National SACNAS Organization during tenure as an officer.

Received a Graduate and Professional Chapter of the Year Award from the National SACNAS Organization during tenure as an officer.

Cougars of Data Science Founding Officer and Secretary (Fall 2022 – Spring 2023)

Founded the first data science-oriented organization at the University of Houston. Compiled transcripts, files, and notes of monthly organizational meetings.

ACADEMIC AND COMMUNITY SERVICE

Daane Lab, Houston, Texas

Undergraduate Researcher - applied μ CT imaging and morphometrics approaches to investigate changes to skeletal density and body shape during fish evolution. (Fall 2023 - Fall 2025)

Mathnasium, Houston, Texas

Instructor – Built student understanding of K-12 mathematics, working primarily with middle and high school students. Prepared said students for success in their following yearly math class. (Summer 2022 – Fall 2024)

SACNAS UH Freshmen/Transfer Mentorship Program, Houston, Texas

Mentor - Mentored a first-year undergraduate student, offered them academic and moral support, and exposing them to a good first-year University experience (Fall 2022)

Multicultural Education and Counseling through the Arts (MECA), Houston, Texas

Tutor - Built student understanding of K-12 mathematics, and prepared said students for success in their following yearly math class. (Fall 2022 - Fall 2023)

Botanica Furniture Experiences, Valencia, Spain (Virtual)

Intern – Assisted in *Phoenix Dactylifera* (date palm) research by utilizing ecological seed oil extraction methods. Took part in Lean Canvas/Startup business bootcamp. (Summer 2021)

Campus Outreach Department, Lone Star College-CyFair, Cypress, Texas

Honors College Virtual Webinars, regular volunteer/host – Promoted the campus Honors College to incoming and current students (Fall 2020 – Spring 2021)

The Honors College, Lone Star College-CyFair, Cypress, Texas

Honors Emissary Team

Recruited for the Honors College to current and incoming first-year students (Spring 2020 – Spring 2021)

Honors Day Moderator/Videographer

Moderated and recorded Honors Conference presentations (Fall 2019 – Spring 2021)

Chancellor Fellow Panelist

Participated in a panel to introduce and educate first-year Chancellor Fellow Students (Summer 2020)

Chemistry Corner Tutor

Tutored Introduction to Chemistry and General Chemistry I & II weekly (Fall 2019 – Spring 2020)

Empowerment Center Student Volunteer

Advertised the Lone Star College empowerment center and assisted with the popcorn machine (Fall 2019)

Honors College Table Volunteer

Promoted the Honors College at the campus club rush (Fall 2019)

HONORS, AWARDS, AND RECOGNITION

- o IEEE International Conference on Healthcare Informatics Student Award (IEEE ICHI, TCII-sponsored): 2026
- o Jack Kent Cooke Foundation, Jack Kent Cooke Graduate Scholar: 2025
- o The Society for Advancement of Chicanos/Hispanics & Native Americans in Science (SACNAS), Graduate and Professional Chapter of the Year Award: 2023
- o University of Houston, Summer Undergraduate Research Fellowship (SURF): 2023
- o The Society for Advancement of Chicanos/Hispanics & Native Americans in Science (SACNAS), Chapter Best Practices award in Outstanding STEM Diversity Award: 2022
- o University of Houston, Department of Natural Sciences and Mathematics Dean's List: 2022-2024
- o Jack Kent Cooke Foundation, Jack Kent Cooke Undergraduate Transfer Scholar: 2021
- o Lone Star College, President's List: 2019-2021
- o Texas Education Opportunity Grant: 2019-2020
- o Lone Star College, Honors College Chancellor Fellow Scholarship: 2019
- o CyFair Education Foundation, Schroeder Scholarship: 2019
- o CyFair Federal Credit Union, \$3500 Pattie R. Miller Memorial Scholarship: 2019

ACADEMIC MEMBERSHIPS

Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) (Fall 2022 - Fall 2023)

Pi Mu Epsilon Membership (Spring 2022 - Spring 2024)

Phi Theta Kappa Membership (Summer 2020 - Spring 2024)

PROFESSIONAL AND TECHNICAL SKILLS

Experience in Python:

- Numpy
- Matplotlib
- Math Module
- Image Processing
- Pandas
- SK Learn

Experience in R/R Studio

Beginner Experience in Matlab

Beginner Experience in Tableau

Experience in micro CT scans through Skyscan

Experience in Bruker's Data Viewer Software

Experience in Bruker's DataVox Software

Experience in Bruker's CT Analyzer Software

Experience in Amira segmentation software

Proficient in English and Spanish