

Jordy Cheyem Lopez Garcia

Curriculum Vitae

Personal Information

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Education

- 08/19 – **P.h. D. in Mathematics**, *Texas A&M University*, College Station, Texas
Advisor: Frank Sottile
Co-Advisor: Paulo Lima-filho
- 01/14–05/16 **M.S. in Mathematics**, *The University of Texas Rio Grande Valley*, Brownsville, Texas, *GPA 4.00/4.00*
Advisor: Paul-hermann Zieschang.
Thesis: *On Hypergroups of Order at Most 6*
- 08/11–05/16 **B.S. in Mathematics**, *The University of Texas Rio Grande Valley*, Brownsville, Texas, *GPA 3.94/4.00*
Summa cum laude and Minor in (Visual) Arts, drawing and painting concentration

Papers (Reverse Chronological)

- [1] [\$\mathbb{A}^1\$ -Brouwer Degrees in Macaulay2](#). Joint work with Borisov, Brazelton, Espino, Hagedorn, Han, Louwsma, Ong and Tawfeek
- [2] [Deficiency of Chemical Reaction Networks: The Effect of Operations that Preserve Multistationarity and Periodic Orbits](#). Submitted. Joint work with Gutierrez, Leake, Sobie and Shiu.
- [3] [Additive Invariants of Open Petri Nets](#). Submitted. Joint work with Bumpus, Libkind, Sorkatti and Tenka.
- [4] [Irreducibility of the Dispersion Polynomial for Periodic Graphs](#). Submitted. Joint work with Faust.
- [5] [Real Solutions to Systems of Polynomial Equations in Macaulay2](#). Submitted. Joint work with Maluccio, Sottile and Thomas Yahl.
- [6] [On Hypergroups of Order at Most 6](#). M.S. thesis, May 2016, 38 pp., 51 tables, references, 8 titles.

Employment

- 08/19– **Graduate Teaching Assistant**, *Texas A&M University*, College Station, TX, USA, Duties involve grading, lead Calculus recitations and Python labs, and during Summer 2021 taught (through zoom) Mathematics for Business and Social Sciences
- 06/11/22– **Graduate Research Assistant**, *MSRI-UP*, Berkeley, CA, USA, I mentor students of the Mathematical Sciences Research Institute Undergraduate Program, led by Dr. Anne Shiu and Dr. Federico Ardila. I advised students on their research projects, and gave talks on Descartes' Rule of Signs and "How (Not?) to Give a Talk"
- 07/23/22
- 09/17–06/19 **Sunday School Teacher Volunteer**, *Restauracion y Poder Church*, Brownsville TX, USA
Bible Teacher for Migrant Children
- 09/16–05/19 **Lecturer I**, *The University of Texas Rio Grande Valley*, Brownsville TX, USA
Taught a variety of courses (see Courses Taught Section)
- 08/16–05/19 **High School Teacher**, *Valley Christian High School*, Brownsville TX, USA
Taught Dual Enrollment College Algebra, Advanced Math, Algebra II and volunteered to teach Oil Painting
- 02/17–05/17 **Adjunct Instructor**, *Texas Southmost College*, Brownsville TX, USA, I taught Dual Enrollment College Algebra at Valley Christian High School
- 09/15–05/16 **Graduate Teaching Assistant**, *The University of Texas Rio Grande Valley*, Brownsville TX, USA, As a GTA, I proctored exams, graded papers and tutored
- 06/15–08/15 **College of Sciences Graduate Assistant**, *The University of Texas at Brownsville*, Brownsville TX, USA
I created the MathJax code for a pool of questions for Math Education courses.
- 09/14–05/15 **Teaching Assistant**, *The University of Texas at Brownsville*, Brownsville TX, USA, I proctored exams, graded papers and tutored
- 07/14–08/14 **College of Sciences Tutor**, *The University of Texas at Brownsville*, Brownsville TX, USA
I tutored students in a Precalculus JumpStart course and held two workshops prior to their exams. Additionally, I held an Algebra II workshop for high school students of the Math and Science Academy of UT Brownsville.
- 01/14–05/14 **Title V Calculus Tutor**, *The University of Texas at Brownsville*, Brownsville TX, USA
Certified CRLA Level 1. I held weekly workshops for Calculus I students.
- 08/13–12/13 **Learning Enrichment Tutor**, *The University of Texas at Brownsville*, Brownsville TX, USA, I tutored a variety of courses ranging from College Algebra to Calculus
- 08/12–05/13 **Teaching Assistant**, *The University of Texas at Brownsville*, Brownsville TX, USA, I tutored a variety of courses ranging from College Algebra to Calculus
- 03/12–05/12 **Instructor Assistant**, *The University of Texas at Brownsville*, Brownsville TX, USA, I created pools of problems of Elementary Statistics.

Other Professional Activities

- 11/04/23 **SIAM TX/LA Special Session Co-organizer**, *University of Louisiana at Lafayette*, Lafayette, LA
Together with Julia Lindberg, I organized the mini symposium, "Nonlinear Algebra in Applications"
- 10/13/23-10/15/23 **Spectral Theory and Applications, Co-organizer**, *Texas A&M University*, College Station, TX
- 08/23 – 12/23 **Hullabaloo U Instructor of Record**, *Texas A&M University*, College Station, TX, I taught a first year seminar course for math undergraduates as an introduction to Texas A&M University
- 06/23-07/23 **Participant in Simons Laufer Mathematical Sciences Institute summer school: Introduction to Derived Algebraic Geometry**, *UC Berkeley*, Berkeley, CA
- 06/23 **Participant in Macaulay2 workshop**, *University of Minnesota, Twin Cities*, Minneapolis and Saint Paul, MN
- 11/04/23 **Participant in Algebraic Geometry in Spectral Theory workshop**, *ICERM*, Brown, RI
- 11/04/22 **SIAM TX/LA Special Session Co-organizer**, *University of Houston*, Houston, TX
Together with Josué Tonelli-Cueto and Thomas Yahl, I organized the mini symposium, "Applications and Computation in Algebraic Geometry."
- 08/22 – 12/22 **Twoples Directed Reading Program, Mentor**, *Online*
- 08/21 – **Directed Reading Program , Co-organizer**, *Texas A&M University*, College Station, TX
Together with Angelique Morvant and Dr. Anne Shiu, I promote such nation-wide program among undergrad and graduate students, select recipients, and host the DRP symposium at the end of the semester.
- 08/21 – **Graduate Algebra Symposium, Co-organizer**, *Texas A&M University*, College Station, TX
I organize the TAMU chapter of the Graduate Student Symposium between Texas A&M University, the University of North Texas, the University of Texas at Arlington, and the University of Oklahoma.
- 08/21 – 08/22 **Treasurer**, *American Mathematical Society Graduate Student Chapter*, College Station, TX

Talks/Posters

- 11/06/23 **Operators, Polytopes, and Toric Geometry**, *University of Louisiana at Lafayette*, SIAM TX/LA Conference, Lafayette, LA
- 11/04/23 **A1BrouwerDegrees in Macaulay2**, *University of Louisiana at Lafayette*, SIAM TX/LA Conference, Lafayette, LA
- 03/18/23 **Discrete Periodic Schrödinger Operators and Algebraic Geometry**, *Georgia Tech*, AMS Southeastern Regional Meeting, Atlanta, GA
- 01/05/23 **Functors on Open Petri Nets**, Joint Mathematics Meetings, Boston, MA

- 01/04/23 **Discrete Periodic Operators and Algebraic Geometry**, Joint Mathematics Meetings, Boston, MA
- 11/04/22 **Extending Irreducibility of Bloch Varieties**, *University of Houston*, SIAM TX/LA Conference, Houston, TX
- 10/01/22 **Poster: Extending Irreducibility of Bloch Varieties**, *Texas A&M University*, Texas Algebraic Geometry Symposium, College Station, TX
- 05/03/22 **Poster: Using Macaulay2 to Study Real Roots of Polynomial Systems**, *University of Notre Dame*, Future Faculty Workshop, South Bend, Indiana
- 11/13/21 **Using Macaulay2 to Count Real Roots of Univariate Polynomials**, *University of North Texas*, Graduate Algebra Symposium, Zoom
- 11/5/21 **Using Macaulay2 to Count Real Roots of Univariate Polynomials**, SIAM TX/LA Conference, South Padre Island, Texas
- 03/27/21 **What is a Scheme?**, *Texas A&M University*, GIG'EM Graduate Student Conference, College Station, Texas
- 05/16 **The Baker-Campbell-Hausdorff Formula**, *The University of Texas Rio Grande Valley*, Master Project Capstone, Brownsville, Texas
- 04/16 **On Hypergroups of Order at Most 6**, *The University of Texas Rio Grande Valley*, Thesis Defense, Brownsville, Texas
- 04/15 **Hypergroups and Buildings 2**, *The University of Texas at Brownsville*, Pure Math Seminar, Brownsville, Texas
- 04/15 **Hypergroups and Buildings 1**, *The University of Texas at Brownsville*, Pure Math Seminar, Brownsville, Texas
- 02/13 **On Galois Theory**, *The University of Texas at Brownsville*, Algebra Day, Brownsville, Texas

Honors, Awards and Memberships

- 05/22 **Houston A&M Mother's Club Outstanding TA Award**
- 08/19– **American Mathematical Society Student Member**
- 08/19– **Mathematical Association of America Student Member**
- 08/11–05/16 **BS Summa Cum Laude**, *The University of Texas Rio Grande Valley*
- 01/15–05/16 **Baptist Student Ministry member**, *The University of Texas Rio Grande Valley*, Volunteered in several community events and gave a talk on the life of King David from the Bible
- 08/11–05/16 **Scorpion Scholar**, *The University of Texas at Brownsville*, I received full financial support for the Bachelor degree and part for the Master degree in Mathematics
- 08/11–05/14 **Scholastic Excellence Award in Mathematics**, *The University of Texas at Brownsville*, Academic Achievement in the Mathematics Department
- 05/14 **Student Juried Show Exhibitor**, *The University of Texas at Brownsville*
- 08/13–05/14 **Chi Alpha member**, *The University of Texas at Brownsville*

- 08/13–12/13 **College Reading and Learning Association Level 1**, *The University of Texas at Brownsville/Texas Southmost College*
- 08/11–05/12, 05/13 **President's List**, *The University of Texas at Brownsville/Texas Southmost College*
- 08/12–12/12 **Dean's List**, *The University of Texas at Brownsville/Texas Southmost College*
- 01/12–05/12 **Provost Essay Finalist**, *The University of Texas at Brownsville/Texas Southmost College*, My essay on why Mexican-Americans cheer the Mexican soccer team when playing the US Team got to the finalist category
- 05/11 **Paul Hanson Memorial Spiritual Leadership Award**, *Valley Christian High School*
- 05/11 **Valedictorian**, *Valley Christian High School*
- 05/11 **Distinguished Lecture Series Essay finalist**, *The University of Texas at Brownsville/Texas Southmost College*, Toms Shoes founder Blake Mycoskie selected my essay on the importance of giving to be in the finalist tier
- 08/10–05/11 **Student Council President**, *Valley Christian High School*
- 08/10–05/11 **Brownsville Jr. Leadership member**, *City of Brownsville, Texas, USA*, Hosted the "We CAN Rock Brownsville" concert to collect non-perishable items to give to families in need in the border cities of Matamoros, Mexico and Brownsville, USA

Undergraduate Projects I Mentored

- 07/22 – 12/22 **Directed Reading Program with Jasmine Arredondo-Torres**, *Twoples Program*, I guide a directed reading on Loring Tu's *Introduction to Manifolds*
- 06/22 **REU with Awildo Gutierrez, Elijah Leake and Caelyn Sobie**, *MSRI Undergraduate Program*, I advise students on research paths, revise their research paper and give constructive criticism on their talks
- 06/22 – 07/22 **REU with Alexis Edozie, Odalys Garcia-Lopez and Viridiana Neri**, *MSRI Undergraduate Program*, I advised students on research paths, revised their research paper and gave constructive criticism on their talks
- 01/21 – 04/21 **Directed Reading Program with Tessora Stefan**, *Texas A&M University*, I guide a directed reading on Munkres' *Topology* and the proof of the infinity of primes using the arithmetic-progression topology
- 01/19 – 05/19 **Poster: Minimum Network Problems by Alexandra Castillo**, *The University of Texas Rio Grande Valley*, I co-advised the project with Dr. Oleg Musin
- 01/19 – 05/19 **Poster: Robin and Lagarias Criteria by Andrea Lerma**, *The University of Texas Rio Grande Valley*, I co-advised the project with Dr. Oleg Musin
- 01/19 – 05/19 **Poster: Four Color Theorem by Brenda Garcia**, *The University of Texas Rio Grande Valley*, I co-advised the project with Dr. Oleg Musin
- 01/19 – 05/19 **Poster: License Plates Recognition Using Neural Networks by Armando Silva**, *The University of Texas Rio Grande Valley*, I co-advised the project with Dr. Oleg Musin

- 01/19 – 05/19 **Poster: Voronoi Diagrams and Delaunay Triangulations by Estefania Sierra**, *The University of Texas Rio Grande Valley*, I co-advised the project with Dr. Oleg Musin
- 01/19 – 05/19 **Poster: Kepler's Conjecture by Monica Muñoz**, *The University of Texas Rio Grande Valley*, I co-advised the project with Dr. Oleg Musin
- 01/19 – 05/19 **Poster: The Cake Cutting Problem by Ana Gabriela Gutierrez**, *The University of Texas Rio Grande Valley*, I co-advised the project with Dr. Oleg Musin
- 07/18 – 12/18 **Poster: The Isoperimetric Problem of Polyhedra by Aldo Gonzalez**, *The University of Texas Rio Grande Valley*, I co-advised the project with Dr. Oleg Musin
- 07/18 – 12/18 **Poster: Two-Distance Sets by Jessica Juarez**, *The University of Texas Rio Grande Valley*, I co-advised the project with Dr. Oleg Musin

Languages

Spanish Mother Tongue
English Fluent
French Basic

Programming

Macaulay2 Co-authored packages `RealRoots.m2` and `A1BrouwerDegrees.m2`
Python Developed supplemental material for calculus students at Texas A&M