

# Jorge Cisneros Paz

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## Education

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University of Washington, 1410 NE Campus Parkway, Seattle, WA 98195

- Ph.D. Candidate in Applied Mathematics
  - Advisor: Bernard Deconinck, PhD
  - Anticipate completion and defense of dissertation in June 2022
  - <https://amath.washington.edu/people/jorge-cisneros-paz>
- M.S., Applied Mathematics, 2019

University of Texas Rio Grande Valley\*, 1201 W. University Drive, Edinburg, TX 78539

- B.S., Mathematics, 2017
  - Concentration in Applied Mathematics
  - Advisor: Zhijun Qiao, PhD
- B.S., Physics, 2017
- *Minor in Chemistry, Honors Program, Summa Cum Laude*

\*formally known as University of Texas-Pan American before Fall 2015

## Areas of Interest

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### General

Complex analysis, computational methods, fluid mechanics, mathematical physics, numerical analysis, ordinary differential equations, partial differential equations

### Emphasis

Asymptotic analysis, integral equations, finite-difference schemes, nonlinear waves and coherent structures, perturbation methods, Unified Transform Method of Fokas, water wave equations

## Skills

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### Professional

- ability to carry out independent/collaborative projects as shown by current/past research experiences
- drive to comprehend new material and subject matter quickly
- effectively work with limited supervision
- efficient organization and communication of ideas in written/oral presentations
- ability to identify and prioritize tasks while anticipating potential problems
- competence in computation and quantitative analysis

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Last updated on June 19, 2020

### Programming and Formatting (in order of proficiency)

- MATLAB, Mathematica, Ansys Fluent, Maple, C++, Sage, R
- L<sup>A</sup>T<sub>E</sub>X
- Microsoft Word, Excel, PowerPoint

### Languages

English, Spanish, and some French

## Publications

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### In Print

3. J. Cisneros and D. N. Riahi, *Two-phase blood flow and thermal effects in elastic stenosed arteries*, Adv. Sci. Eng. & Med. 10, 11, 1130-1142, 2018.
2. R. Roy, D. N. Riahi, and J. Cisneros, *Effect of combined anticancer drugs treatment on heterogeneous brain tumors*, Int. J. Appl. & Comp. Math. 3, 4, 3877-3896, 2017.
1. R. Roy, J. Cisneros, and D. N. Riahi, *Unsteady two-phase flow in a catheterized artery with atherosclerosis*, Int. J. Fluid Mech. Res. 42, 2, 334-354, 2015.

### Submitted for Publication

1. J. Cisneros, C. M. Hartley, E. E. Masten, L. M. Mestre, N. Poppelreiter, R. Rebarber, N. J. Roberts, L. J. Sturman, and B. Tenhumberg, *Analysis of a metapopulation with an Allee effect*, submitted for publication, 2017.

### In Preparation

1. J. Cisneros and B. Deconinck, *The Unified Transform Method for semi-discrete linear evolution IBVPs on the half-line*, in preparation.

### Technical Papers

3. J. Cisneros and Z. Qiao, *Inverse scattering transform applied to the initial-value problem for the KdV equation*, Senior Project, 2017.
2. J. Cisneros, N. Malhotra, M. J. Perez Pereda, and M. Stuart, *Ballast cleaning scheduling optimization*, RIPS Summer Program, 2016.
1. J. Cisneros, O. Ong, and L. Scheel, *Factorization lengths and elasticity in numerical monoids*, PURE Math REU, 2014.

## Research Experience

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### Summer Research Programs

3. Research in Industrial Projects for Students (RIPS) (Summer 2016)
  - Funded nine-week summer program at Los Angeles, California with the Institute for Pure and Applied Mathematics (IPAM) and CSX Transportation
  - Developed a modified version of traveling-salesman algorithm to schedule near-optimal ballast-cleaner routes, taking as input list of jobs with priorities, regions with curfew, and other relevant scheduling data
  - Supervision under Masoumeh Taslimi (CSX), Kamalesh Somani (CSX), and Susana Serna (IPAM)

2. Applied Mathematics Research Experience for Undergraduates in the Nebraska Summer Research Program (Summer 2015)
  - Funded eight-week summer REU program at Lincoln, Nebraska with the University of Nebraska-Lincoln, producing publishable work
  - Devised a model for a metapopulation with carrying capacity and Allee threshold in an arbitrary number of patches to study which combination of initial and deterministic/stochastic parameters lead to persistence of population
  - Supervision under Richard Rebarber (UNL) and Brigitte Tenhumberg (UNL)
1. Pacific Undergraduate Research Experience (PURE) Math Summer Program (Summer 2014)
  - Funded five-week summer REU program at Hilo, Hawaii with the University of Hawaii-Hilo and Sam Houston State University, producing technical paper
  - Explored methods of finding maximum/minimum factorization lengths for elements in any monoid generated by an arithmetic sequence, as well as characterizing elasticity of elements in monoids with only 2 generators
  - Supervision under Roberto Pelayo (UHH) and Brian Wissman (UHH)

## Presentations

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### Conferences

16. 2nd Biennial Meeting of SIAM Pacific Northwest Section<sup>†</sup> (October 18 – 20, 2019)
  - Talk: “The Unified Transform Method for linear semi-discrete evolution IBVPs on the half-line & finite interval”
  - Seattle University, Seattle, WA
15. Applied Mathematics: The Next 50 Years Conference (June 19 – 21, 2019)
  - Poster: “The Unified Transform Method for the semi-discrete heat equation on the half-line”
  - University of Washington, Seattle, WA
14. 4th Coastal Bend Mathematics & Statistics Conference (March 23, 2019)
  - Talk: “The Unified Transform Method for the semi-discrete heat equation on the half-line”
  - University of Texas Rio Grande Valley, Edinburg, TX
13. 2017 Joint Mathematics Meetings<sup>†</sup> (January 4 – 7, 2017)
  - Talk: “Ballast cleaning schedule optimization”
  - Hyatt Regency Atlanta and Marriott Atlanta Marquis, Atlanta, GA
12. 2016 SACNAS National Conference<sup>†</sup> (October 13 – 15, 2016)
  - Poster: “Ballast cleaning schedule optimization”
  - Long Beach Convention Center, Long Beach, CA
11. 2016 IBII International Conference on Mathematics and Applications<sup>†</sup> (April 28 – 30, 2016)
  - Talk: “Analysis of a metapopulation model with an Allee effect”
  - Talk: “Parallel biconjugate gradient stabilized method using the OCCA library”
  - Sam Houston State University - The Woodlands Center, The Woodlands, TX
10. Great Plains Honors Conference 2016<sup>†</sup> (April 8 – 10, 2016)
  - Talk: “Analysis of a metapopulation model with an Allee effect”
  - John Brown University & Oral Roberts University, Siloam Springs, AR

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<sup>†</sup>presentations with awarded travel scholarship (conference registration, round-trip flights, lodging, etc.)

9. 96th Annual Meeting of the Texas Section of the MAA<sup>†</sup> (March 31 – April 2, 2016)
  - Talk: “Biconjugate gradient stabilized method on graphical processing units”
  - Stephen F. Austin State University, Nacogdoches, TX
8. APS March Meeting 2016<sup>†</sup> (March 14 – 18, 2016)
  - Poster: “Microwave irradiation on graphene dispersed within polymeric matrices”
  - Baltimore Convention Center, Baltimore, MD
7. Latin@s in the Mathematical Sciences Conference at the Institute for Pure and Applied Mathematics<sup>†</sup> (April 9 – 11, 2015)
  - Poster: “Two-phase blood flow and thermal effects in elastic artery with stenosis”
  - University of California - Los Angeles, Los Angeles, CA
6. Third Annual Undergraduate Research Conference (November 24, 2014)
  - Talk: “Two-phase blood flow and thermal effects in elastic artery with stenosis”
  - Talk: “Factorization lengths and elasticity in numerical monoids”
  - University of Texas-Pan American, Edinburg, TX
5. PACE 2014 Ethics Conference: Bioethics & the Future of Medical Education (November 4, 2014)
  - Talk: “Two-phase blood flow and thermal effects in elastic artery with stenosis”
  - University of Texas-Pan American, Edinburg, TX
4. 2014 SACNAS National Conference<sup>†</sup> (October 16 – 18, 2014)
  - Poster: “Atherosclerosis effect on blood flow in a catheterized artery”
  - Los Angeles Convention Center, Los Angeles, CA
3. 16th Annual University of Texas-Brownsville Research Symposium (April 4, 2014)
  - Talk: “Atherosclerosis effect on blood flow in a catheterized artery”
  - University of Texas-Brownsville, Brownsville, TX
2. PACE 2014 Ethics Conference: Bioethics Day @ MORE Health: Public Health, Public Dilemmas (March 25, 2014)
  - Poster: “Atherosclerosis effect on blood flow in a catheterized artery”
  - University of Texas-Pan American, Edinburg, TX
1. Second Annual Undergraduate Research Conference (November 26, 2013)
  - Talk: “Atherosclerosis effect on blood flow in a catheterized artery”
  - University of Texas-Pan American, Edinburg, TX

### Seminars and Workshops

7. Mathematical Methods Journal Club (January 14, 2020)
  - Talk: “The semi-discrete Unified Transform Method for the linear KdV equation on the finite interval”
  - University of Washington, Seattle, WA
6. Mathematical Methods Journal Club (October 29, 2019)
  - Talk: “The Unified Transform Method for linear semi-discrete evolution IBVPs on the finite interval: linear Schrödinger equation”
  - University of Washington, Seattle, WA
5. Mathematical Methods Journal Club (May 7, 2019)
  - Talk: “The Unified Transform Method for the semi-discrete heat equation on the half-line”
  - University of Washington, Seattle, WA

4. UTRGV Alumni Forum on Nonlinear Systems (March 24, 2019)
  - Talk: “The Unified Transform Method for the semi-discrete heat equation on the half-line: Dirichlet and Neumann BCs”
  - University of Texas Rio Grande Valley, Edinburg, TX
3. Mathematical Methods Journal Club (April 23, 2018)
  - Talk: “Ballast cleaning schedule optimization”
  - University of Washington, Seattle, WA
2. Applied Mathematics Seminar (December 4, 2014)
  - Talk: “Optimizing free-convection models influenced by cavity dimensions, Reynolds, Prandtl, and Froude numbers”
  - University of Texas-Pan American, Edinburg, TX
1. Secret Student Seminar (April 11, 2014)
  - Talk: “Atherosclerosis effect on blood flow in a catheterized artery”
  - University of Texas-Pan American, Edinburg, TX

### Participation

6. 2018 Conference of Ford Fellows<sup>†</sup> (October 19 – 20, 2018)
  - Arnold and Mabel Beckman Center of the National Academies of Sciences and Engineering, Irvine, CA
5. NSF-CBMS Conference on Solving Problems in Multiply-Connected Domains<sup>†</sup> (June 18 – 22, 2018)
  - University of California-Irvine, Irvine, CA
4. Wave Equations and Integrable Systems Graduate Seminar (Spring 2017, Fall 2015)
  - University of Texas Rio Grande Valley, Edinburg, TX
3. Field of Dreams Conference<sup>†</sup> (November 4 – 6, 2016)
  - Washington University, St. Louis, MO
2. 2016 Modern Math Workshop @ SACNAS<sup>†</sup> (October 12 – 13, 2016)
  - Long Beach Convention Center, Long Beach, CA
1. Calculus Bowl @ 96th Annual Meeting of the Texas Section of the MAA<sup>†</sup> (March 31, 2016)
  - Stephen F. Austin State University, Nacogdoches, TX

### Awards and Honors

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7. President’s List for UTRGV (Fall 2015 – Spring 2017)
  - Released after each Fall and Spring semester and includes undergraduate students who enrolled in at least 12 college-level hours and earned a GPA of 3.5 for courses taken that semester
  - Awarded each semester since start of UTRGV in Fall 2015 to Spring 2017
6. C-STEM Student Research Program at UTRGV (Fall 2015)
  - Funded research program that provides support for undergraduate students to conduct research with faculty in Department of Defense research areas of interest
5. Dean’s List for UTPA (Fall 2013 – Spring 2015)
  - Released after each Fall and Spring semester and includes undergraduate students who enrolled in at least 12 college-level hours and earned a GPA of 3.5 for courses taken that semester
  - Awarded each semester since Fall 2013 to end of UTPA in Spring 2015

4. Undergraduate Research Initiative (Spring 2015)
  - Award to fund project “Traveling-wave solutions of nonlinear partial differential equations” in student salary and travel expenses
3. Academic Deans’ Outstanding Student (Spring 2015)
  - Award to honor top three students from each UTPA college at the 36th Annual Awards and Recognition Convocation
2. Student Excellence Award (Spring 2015)
  - Recognition award for contribution to UTPA College of Science and Mathematics and for advances in mathematics through research projects
1. 16th Annual University of Texas-Brownsville Research Symposium (Spring 2014)
  - First prize for oral presentations in Physical and Mathematical Sciences Section

## Fellowships and Scholarships

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11. Ford Foundation Predoctoral Fellowship (Fall 2017 – Summer 2020)
  - Recipient of Ford Fellowship for \$24,000 per year for 3 years of PhD program to cover all remaining expenses
10. Graduate Opportunities & Minority Achievement Program Fellowship (Fall 2017 – Spring 2018, Fall 2021 – Spring 2022)
  - Recipient of Presidential Fellowship for \$20,000 per year for first and last year of PhD program to cover all remaining expenses
9. Jesse H. & Mary G. Jones Scholarship (Spring 2017)
  - Recipient of UTRGV Honors Program scholarship for \$500 to cover all university-related expenses
8. UTRGV Achieve Grant (Spring 2016, Fall 2016, Spring 2017)
  - Recipient of UTRGV scholarship to cover all university-related expenses not covered by other scholarships, with an additional \$500 for book expenses
7. Texas Grant Program (Fall 2014, Spring 2015, Fall 2015)
  - Recipient of UTPA scholarship for \$2,500 per semester to cover all university-related expenses
6. Texas Public Educational Grant (Fall 2014, Spring 2015, Fall 2016, Spring 2017)
  - Recipient of UTPA/UTRGV scholarship for \$1,000 per semester to cover all university-related expenses
5. Texas Grant Program – New Initial High School (Fall 2013, Spring 2014)
  - Recipient of UTPA scholarship for \$2,500 per semester to cover all university-related expenses
4. FY14 Miscellaneous Agency Scholarship (Fall 2013, Spring 2014)
  - Recipient of UTPA scholarship for \$750 per semester to cover all university-related expenses
3. FY2014 Miscellaneous Restricted Scholar (Spring 2014)
  - Recipient of UTPA scholarship for \$500 per semester to cover all university-related expenses
2. South Texas Federal Credit Union Scholarship (Fall 2014)
  - Recipient of Annual Scholarship Challenge for \$1,000 to cover book expenses
1. FY14 University Scholar Meritorious (all of undergraduate studies)
  - Recipient of UTPA/UTRGV scholarship for \$2,000 per semester to cover all university-related expenses

## Leadership

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### Outreach and Service

- Lockwood Elementary School Math Fair (December 11, 2019)
  - Demonstrations in mathematics for 4th and 5th grade students
- Northshore Middle School Math Fair (March 14, 2019)
  - Demonstrations in mathematics for a district-wide after-school math fair
- Graduate Student Mentorship Program (Summer 2019 – Fall 2019)
  - Guidance and assistance for incoming first-year graduate students into the Applied Mathematics Department at UW
- Applied Partial Differential Equations Seminar (Spring 2018 – today)
  - In charge of weekly seminar that focuses on study of analytical & numerical solution methods for PDEs, analysis of their solutions, and their applications, among other topics
- Flags and More Flags volunteer (Summer 2014)
  - Designer and salesman
  - Designed several flag designs for small businesses and local car dealerships
  - Developed professional and formal communication skills
- Mathematics Tutor (Summer 2012 – today)
  - On request
  - Topics from basic algebra to vector geometry to proof-writing to solving ODEs/PDEs
  - One-on-one or group sessions for exams or to better understand material
- Physics Tutor (Summer 2012 – today)
  - On request
  - Topics from introductory physics to thermodynamics to electromagnetism
  - One-on-one or group sessions for exams or to better understand material

### Organizations and Societies

- Society for Industrial and Applied Mathematics (Fall 2017 – today)
  - Organization that ensure strongest interactions between mathematics and other scientific and technological communities through membership activities, publication of journals and books, and conferences
- Sigma Pi Sigma (Fall 2015 – Spring 2017)
  - Elected president for 2016-2017 of a national physics honor society that honors outstanding scholarship in physics and encourages interest in physics among students at all levels, frequently visiting local schools for physics demonstrations and activities
- American Association for the Advancement of Science (Summer 2015 – today)
  - Nominated to be a member of an international non-profit organization dedicated to advancing science for the benefit of all people
- Student Physics Society (Fall 2014 – today)
  - Nominated to be a member of a professional association explicitly designed for students with an interest in the advancement of physics and related fields

- National Alliance for Predoctoral Studies in the Mathematical Sciences (Spring 2014 – Spring 2017)
  - Nominated and accepted to substantially increase likelihood to enter into and succeed in doctoral program in mathematical sciences
- Honor Society of Phi Kappa Phi (Spring 2014 – today)
  - Nominated to most prestigious all-discipline honor society in search for top 7.5%
- Eta Omicron Nu (Fall 2013 – today)
  - Honors organization made to promote and encourage academic excellence among members and all students, and strive toward helping community through service