JORGE L. GONZALEZ
Mathematics Dept. FAU 777 Glades Rd. Boca Raton FL 33431, 786 261 6329, jorgegonzale2013@fau.edu

Research Interests:

Dynamical Systems, invariant manifolds, Bifurcation Theory, Perturbation Theory, ODE, PDE, rigorous error bounds, computer-assisted proofs, Parameterization Method, Computational Topology, Topological Data Analysis, numerical methods, optimization, mathematical modeling, Mathematical Biology, Computational Neuroscience, cognitive modeling, Machine Learning.

Education:

- Ph.D Candidate Mathematics. Florida Atlantic University. Boca Raton FL. Fall 2015.
  Thesis Advisor: J.D Mireles-James and Necibe Tuncer.
  Expected Graduation: Spring 2020. GPA 3.98
- MS Mathematics. Florida Atlantic University. Boca Raton FL. Spring 2015
- MA Mathematics. University of California San Diego. San Diego CA. 2012. GPA 3.73
- BS Mathematics. Florida International University. Miami FL. 2009. GPA 3.81
- BS Physics. Florida International University. Miami FL. 2009. GPA 3.90

Publications:

1. "High-order parameterization of stable/unstable manifolds for long periodic orbits of maps," with J.D Mireles-James (SIAM Journal on Applied Dynamical Systems**,** 2017, Vol. 16, No. 3 : pp. 1748-1795).

Preprints:

1. "Finite element approximation of invariant manifolds by the parameterization method", with J.D Mireles-James and Necibe Tuncer. (submitted)
2. "Towards an explanatory model for network traffic", with Chad Bollmann and Joshua Clymer. (accepted to 2019 IEEE 40th Sarnoff Symposium)
3. "Aggregated impulses: Towards explanatory models for self-similar alpha stable traffic", with Chad Bollmann and Joshua Clymer.
   (accepted to ICSPCS'2019: Signal Processing and Communication Theory 1)

Manuscripts in preparation:

1. "A computer assisted proofs of a diffusion mechanism", with Maciej Capinski, J.D Mireles-James and Jean-Pierre Marco

Internships:

- Naval Research Enterprise Internship Program (NREIP) with the Office of Naval Research (ONR) at the Naval Postgraduate School working on network measurement and cyber attack detection using alpha stable distributions, network traffic modeling. Summer 2019.
  Mentor: CDR Chad Bollmann

Additional Projects:

- Seagrass Restoration Project, Biscayne National Park, Village of Key Biscayne, 82-month monitoring report with Amanda Bourque, Smart-Sciences, Fall 2018
- Spontaneous Symmetry Breaking with Rajamani Narayanan, Florida International University, Spring 2009
- Hilbert's 10^{th} Problem: Study of Exponential Diophantine Sets with Steve Simpson, Pennsylvania State University, Fall 2007
- Study of Regular Variation with Omri Sarig, Pennsylvania State University, Fall 2007
- Study of Modular Curves with Anatole Katok, Pennsylvania State University, Fall 2007
- Cryptography Project with Ravi Ramakrishna, Cornel University, Summer 2007

Research presentations:

- Finite element approximation of invariant manifolds by the parameterization method, CDSNS Colloquium, Georgia Tech, September 30, 2019
- Towards an explanatory model for network traffic, The 40th IEEE Sarnoff Symposium, NJIT, September 23, 2019
- Parameterization Method for Parabolic PDEs, AG Nichtlineare Partielle Differentialgleichungen at Karlsruhe Institute of Technology, Karlsruhe, June 26, 2018
- Parameterization Method for Parabolic PDEs, Dynamics, Topology and Computations DyToComp, Bedlewo, June 18-23, 2018
- Parameterization Method for Parabolic PDEs, Dynamical Systems Seminar at Jagiellonian University, Krakow, June 12, 2018
- Parameterization Method for Parabolic PDEs. Llavefest: A Broad Perspective on Finite and Infinite Dimensional Dynamical Systems. Poster Session, Barcelona, June 12-16, 2017
- Parameterization Method for Parabolic PDEs. SIAM Conference on Applications of Dynamical Systems. Poster Session, Snowbird, May 21-25, 2017
- Parameterization Method for Stable/Unstable Manifolds of Periodic Points for Maps. Special Session (Dynamics and Computations), The 11^{th} AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, July 1-5, 2016
- Parameterization Method for Stable/Unstable Manifolds of Periodic Points for Maps. Poster Session, Dynamics of Evolution Equations, CIRM, Marseille, March 21-25, 2016
- McGehee's proof of the Stable and Unstable Manifold Theorem via isolating blocks, Analysis Seminar, Florida Atlantic University, 2016
- Parametrization Method for Stable/Unstable Manifolds of Periodic Points for Maps, Analysis Seminar, Florida Atlantic University, 2016
- Parameterization Method for Stable/Unstable Manifolds of Periodic Points for Maps. Poster Session, CMS Winter, Montreal, December 4-7, 2015
- Gauss Sums and Reciprocity Laws. BS Mathematics Presentation, Florida International University, Fall 2009
- Spontaneous Symmetry Breaking. McNair Program, Florida International University, Fall 2009
- Hilbert's 10^{th} Problem: Study of Exponential Diophantine Sets, Mathematics Advanced Study Semesters (MASS), Penn State University, Fall 2007

- Study of Regular Variation, Mathematics Advanced Study Semesters (MASS), Penn State University, Fall 2007
- Study of Modular Curves. Mathematics Advanced Study Semesters (MASS), Penn State University, Fall 2007
- Outreach presentation on Cryptography. Summer Math Institute (SMI), Cornell University, Summer 2007

Relevant Courses:

- MAA 5105 Multivariable Analysis
- MAP 6336 Ordinary Differential Equations
- MTG 6316 General Topology
- STA 6446 Stochastic Calculus
- MAA 6907 Numerical Methods and Applications
- MAA 6907 Introduction Theory of Dynamical Systems
- MAP 6345 Partial Differential Equations
- MAT 6907 Introduction to Computer Assisted Proofs
- MAS 6215 Algebraic Number Theory

Teaching Experience:

- Graduate Teaching Assistant at Florida Atlantic University, 2013-present
- Adjunct Instructor at Florida International University, 2017-2018
- Teaching Assistant at University of California San Diego, 2009-2012
- Mathematics/Physics Tutor/Grader at Florida International University, 2007-2009

Computer Skills and Languages:

- MATLAB (fluent), Mathematica (fluent), Python (fluent), Java (beginner), R (fluent), Julia (beginner), Excel (fluent), C++ (beginner)
- Spanish (native)

Awards and Fellowships:

- Florida Bright Futures Scholarship, Fall 2004
- Robert Leo Thomas Scholarship
- Florida NU Balanced Man Scholarship Finalist, Fall 2004
- Honor College Student at Florida International University, Fall 2005
- McNair Post Baccalaureate Achievement Fellow, 2008-2009
- Award for Outstanding Academic Achievement in Mathematics, Spring 2009
- Phi Beta Kappa, Spring 2009
- FAU Graduate Grant, Fall 2013
- Provosts Fellowship, Fall 2013
- Delores Auzenne Fellowship, Fall 2016
- FAU Graduate Grant, Fall 2016
- Gus and Sharon Pearthree Math Graduate Scholar Award, Fall 2017
- Stuyvesant Legacy of Excellence in STEM Scholarship, Fall 2018