Ivan Ramirez Zuniga

University of Tennessee Health Science Center
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CITIZENSHIP

Costa Rica with permanent residency in the U.S.

EDUCATION

Ph.D., Mathematics, University of Pittsburgh, 2020.
Thesis: "Mathematical Modeling of Energy Consumption in the Acute Inflammatory Response"
Advisors: Dr. Jonathan E. Rubin and Dr. David. Swigon

MS., Mathematics, East Tennessee State University, 2014.
Thesis: "Mathematical Modeling of Immune Responses to Hepatitis C Virus Infection" .
Advisor: Dr. Ariel Cintrón-Arias.

B.S, Mathematics, University of Costa Rica, 2010.

RESEARCH INTERESTS

Mathematical immunology and bioenergetics, parameter estimation, uncertainty quantification, infectious diseases, optimal control, differential equations, partial differential equations, epidemiology, population dynamics.

AWARDS

1. **Andrew Mellon Predoctoral Fellowship, University of Pittsburgh, 2019-2020**:
   These are competitive fellowships that are awarded to students of exceptional promise and ability who are enrolled in programs leading to the PhD in various fields of the humanities, natural sciences, and social sciences.
2. **Arts and Sciences Graduate Fellowship, University of Pittsburgh, 2014-2015**:
   These fellowships are used to recruit doctoral students of exceptional promise and ability either when they first enroll in the PhD program or for later years.

PUBLICATIONS

1. **I. Ramirez Zuniga**, J.E. Rubin, D. Swigon, and G. Clermont. *Mathematical Modeling of Energy Consumption in the Acute Inflammatory Response*. Journal of Theoretical Biology. Vol 460, 101-114. (2019).
2. R. Brady, C. Puelz, **I. Ramirez Zuniga**, K. Larripa, M.S. Olufsen. *A coupled model exploring the cardiovascular response to an acute inflammatory event*. Proc 5th Int Conf Comp Math Biomed Eng (CMBE) Vol 1. , 336-339. (2017).
3. **I. Ramirez Zuniga** *Mathematical Modeling of Immune Responses to Hepatitis C Virus Infection* . Electronic Theses and Dissertations.(2014). Paper 2425. https://dc.etsu.edu/etd/2425.

PRESENTATIONS

1. **Talk**: (Virtual): "Mathematical Modeling of Energy Consumption in the Acute Inflammatory Response in Sepsis" at the Colloquium in Applied Mathematics at the Department of Mathemtatics, Universidad Nacional, Heredia, Costa Rica, April 2020.
2. **Talk**: "Mathematical Modeling of Energy Consumption in the Acute Inflammatory Response in Sepsis" at the Colloquium of the Department of Mathematics at University of Pittsburgh, Pittsburgh PA, March 2020.
3. **Talk**: "A Data-driven Mathematical Study of the Role of Energy in Sepsis" at the MathBio seminar of the Department of Mathematics at University of Pittsburgh, Pittsburgh PA, February 2020.
4. **Talk**: "A Data-driven Mathematical Study of the Role of Energy in Sepsis" at the Joint Mathematics Meeting 2020, Denver CO, January 2020.
5. **Poster presentation**: "A Data-driven Mathematical Study of the Role of Energy in Sepsis" at the workshop :Summit on the Rules of Life at The Mathematical Biosciences Institute (MBI), Columbus OH, June 2019.
6. **Talk**: "Mathematical Modeling of Energy Consumption in the Acute Inflammatory Response" at the Biology and Medicine Through Mathematics Conference (BAMM), Virginia Commonwealth University, Richmond VA, May 2019.
7. **Talk**: "Mathematical Modeling of Energy Consumption in the Acute Inflammatory Response" at the at the AMS Microconference on Parameter Estimation, Marriot City Center, Minneapolis MN, August 2018.
8. **Talk**: "Mathematical Modeling of Energy Consumption in the Acute Inflammatory Response" at the SIAM conference on the life sciences (LS18), Radisson Blu Minneapolis, Minneapolis MN, August 2018.
9. **Poster presentation**: "Mathematical Modeling of Energy Consumption in the Acute Inflammatory Response" at the research training group in mathematical biology "Parameter Estimation for Mechanistic Biological Models", NC State University, Raleigh NC, July 2018.
10. **Poster presentation**: "Mathematical Modeling of Energy Consumption in the Acute Inflammatory Response" at the Host-pathogens dynamics workshop, The Mathematical Biosciences Institute (MBI), Columbus OH, February 2018.
11. **Poster presentation**: "Mathematical Modeling of the Acute Inflammatory Response and Energy Consumption " at the SIAM Conference on the Life Sciences 2016. Boston, MA July 2016.
12. **Talk**: "Sensitivity Analysis and Optimal Control Treatment of Hepatitis C Virus Dynamics" at the Appalachian Student Research Forum 2014, East Tennessee State University, Johnson City, TN April 2014.
13. **Poster presentation**: "Project 6x4 UEALC" at the Week of Methods to Reduce Dimension in Data Analysis Guanajuato, Mexico, organized by Centro de Investigaciones Matemáticas , CIMAT, and by Rice University, April, 2010.

ATTENDED CONFERENCES, WORKSHOPS, SUMMER SCHOOLS

1. **Conference**: (Virtual) Society for Mathematical Biology, Annual Meeting and Conference, 2020.
2. **Conference**: Joint Mathematics Meeting 2020, Denver CO, January 2020.

3. **Workshop**: Summit on the Rules of Life at The Mathematical Biosciences Institute (MBI), Columbus OH, June 2019.
4. **Conference**: Biology and Medicine Through Mathematics Conference (BAMM), Virginia Commonwealth University, Richmond VA, May 2019.
5. **Conference**: Joint Mathematics Meetings (JMM), Baltimore MD, January 2019.
6. **Micro-conference**: AMS Microconference on Parameter Estimation at the Marriot City Center, Minneapolis MN, August 2018.
7. **Conference**: SIAM, Life sciences (LS18) at the Radisson Blu Minneapolis, Minneapolis MN, August 2018.
8. **Workshop**: Research training group in mathematical biology "Parameter Estimation for Mechanistic Biological Models". NC State University, Raleigh NC, July 2018.
9. **Workshop**: Host-pathogens dynamics at The Mathematical Biosciences Institute (MBI),Columbus OH, February 2018.
10. **Conference**: Parameter Estimation and Uncertainty Quantification for Dynamical Systems, University of Pittsburgh, Pittsburgh PA, March 2017
11. **Conference**: SIAM, Life Sciences 2016, Boston, MA July 2016.
12. **Workshop**: Mathematics Research Communities - Mathematics in Physiology and Medicine, Snowbird Utah, June 2016.
13. **Summer School**: "The Joint 2015 CAMBAM-MBI-NIMBioS" in Nonlinear Dynamics in Biological Systems at McGill University, Montreal, June 2015.
14. **Workshop**: "Parameter Estimation for Dynamic Biological Models" at NIMBioS, May 2014.
15. **Conference**: SEARCDE 2013, University of Tennessee, Knoxville, TN, September 2013.
16. **Conference**: Society for Mathematical Biology Annual Meeting and Conference, Knoxville, TN 2012.
17. **Summer School**: Math Schools for Latin America and the Caribbean, EMALCA, organized by University of Costa Rica, 2012.
18. **Conference**: International Symposium of Applied Methods on Sciences, SIMAC, organized by University of Costa Rica, 2012.
19. **Conference**: International Symposium of Applied Methods on Sciences, SIMAC, organized by University of Costa Rica, 2008.
20. **Conference**: International Symposium of Applied Methods on Sciences, SIMAC, organized by University of Costa Rica, 2006.

TEACHING EXPERIENCE

Teaching Assistant, Fall 2014 – Spring 2019
Department of Mathematics, University of Pittsburgh.
Courses Taught:

- MATH 0031 Algebra, Summer 2020.
- MATH 0450 Introduction to Analysis (Honors), Spring 2019.
- MATH 0220 Calculus I, Fall 2015, Spring 2017, Fall 2018.

- MATH 0230 Calculus II, Fall 2015, Fall 2016, Fall 2018 .
- MATH 0290 Differential Equations, Spring 2018.
- MATH 0240 Calculus III, Summer 2016.
- MATH 0280 Introduction to matrices and Linear Algebra, Spring 2016.

Instructor
Department of Mathematics, University of Pittsburgh.
Courses Taught:

- MATH 0120 Business Calculus, Summer 2019.
- MATH 0240 Calculus III, Summer 2018.
- MATH 0230 Calculus II, Summer 2017.
- MATH 0290 Differential Equations, Summer 2015.

Instructor, Fall 2013 − Summer 2014.
Department of Mathematics, East Tennessee State University (ETSU).
Courses Taught:

- MATH 1920 Calculus II, Spring 2014, Summer 2014.
- MATH 1910 Calculus I, Fall 2013.

Instructor, 2009 − 2012
Department of Mathematics, Universidad de Costa Rica (UCR).
Courses Taught:

- MA 1005 Differential Equations, Spring 2011, Spring 2012, Fall 2012.
- MA 2210 Applied differential equations, Fall 2011, Fall 2012.
- MA 0230 Calculus for Economics, Fall 2011.
- MA 1001 Calculus I, Spring 2009, Spring 2010.
- MA 1002 Calculus II, Fall 2009, Fall 2010.
- MA 1004 Linear Algebra, Spring 2009, Spring 2010.

High School Teacher, 2010 − 2012
Colegio Científico Costarricense (STEM High School type).
Courses Taught:

- MA 0125 Precalculus.
- MA 1001 Calculus I.

COMPUTER SKILLS

Languages: MATLAB, Java.

Tools: XPP-Aut, Mathematica, Maple, and LaTeX.

Platforms: Linux, Windows.

LANGUAGES

Spanish(Native Language)

English(Spoken fluently)

NON-ACADEMIC ACTIVITIES

1. Participant, 1st World Mind Sports Games (Bridge), October 2008, Beijing, China.
2. Participant, 1st World Youth Bridge Congress, August 2009, Istanbul, Turkey.
3. Champions, 25th Central American and Caribbean Bridge Championship, May 2009, Guadeloupe Island.

REFERENCES

Dr. Jonathan E. Rubin
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