

Jordy Cevallos

Curriculum Vitæ

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Personal Information

Full Name: Jordy José Cevallos Chávez

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Network:  ORCID  ResearchGate  Google Scholar  LinkedIn

Education

Jan 2020 - **PhD in Applied Mathematics for Life and Social Sciences**, *Arizona State University*, Tempe, Arizona, United States of America.

Jan 2020 - Apr 2021 **Master of Science in Applied Mathematics for Life and Social Sciences**, *Arizona State University*, Tempe, Arizona, United States of America.

Thesis title: “The Impact of Mobility on the Dynamics of COVID-19 Outbreak in Provinces of Ecuador”

Mar 2014 - Sep 2019 **Bachelor of Science in Mathematics**, *Yachay Tech University*, Urcuquí, Ecuador, *9.3/10*.

Thesis title: “Concentration and Multiplicity of Solutions for a Non-Linear Schrödinger Equation with Critical Frequency: Infinite Case”

Awards and Scholarships

Aug 2023 Institute for Mathematics and Statistical Innovation Travel Award.

May 2023 Graduate and Professional Student Association Assembly Service Award.

Sep 2022 School of Human Evolution and Social Change (SHESC) Travel Grant.

2014–2019 IFTH undergraduate scholarship, Ecuadorian Secretary of Higher Education, Science, Technology and Innovation.

Sep 2019 Cum Laude (9.3/10), Universidad de Investigación de Tecnología Experimental Yachay.

Publications

Finalized

- ▶ Carlos Bustamante-Orellana, Dingyong Bai **Jordy Cevallos-Chávez**, Yun Kang, Benjamin Pyenson, Congbo Xie. Hierarchy Establishment from Nonlinear Social Interactions and Metabolic Costs: an Application to the *Harpegnathos saltator*. *Applied Sciences*. 2022; 12(9):4239. DOI: 10.1080/08898480.2021.1983323.
- ▶ Christine Brasic, Latimer Harris-Ward, Fabio A. Milner, Carlos Bustamante-Orellana, **Jordy Cevallos-Chavez** & Leon Arriola. Lead toxicity in the bald eagle population of the Great Lakes region, *Mathematical Population Studies*, 2021; DOI: 10.3390/app12094239.
- ▶ Ariel Aguas-Barreno, **Jordy Cevallos-Chávez**, Juan Mayorga-Zambrano, and Leonardo Medina-Espinosa. Semiclassical asymptotics of infinitely many solutions for the infinite case of a nonlinear Schrödinger equation with critical frequency. *Bulletin of the Korean Mathematical Society*, 2021; DOI:10.4134/BKMS.b210307.

- ▶ **Jordy Cevallos-Chávez.** Adaptation in Metapopulation: Book Review. *Bionatura*, 2021; Vol. 6, issue 2. pgs. 1880-1881, DOI. 10.21931/RB/2021.06.02.32.
- ▶ Lilian Maritza Spencer, Markus P Tellkamp, Nelson F Santiago Vispo, Isidro R Amaro, **Jordy J Cevallos-Chavez**, Sophía N Anchalí, Dalia N Cabada, Mariana M Arcos, Maria J Aldaz. Evaluation of avian malaria in an inter-Andean dry forest of Imbabura Province in Ecuador , 2021;(Submitted).
- ▶ Christine Brašić, Latimer Harris-Ward, Gregoire Moreau, Carlos Bustamante-Orellana and **Jordy Cevallos-Chávez.** Quantifying the Impact of Chronic Lead Toxicity on the American Bald Eagle (*Haliaeetus leucocephalus*) Population in the Great Lakes Region. 2020; Technical Report for MTBI 2020. DOI 10.13140/RG.2.2.28953.24166.
- ▶ Carlos E Bustamante Orellana, **Jordy Cevallos-Chávez**, Cesar Montalvo, Jeff Sullivian, Edwin Michael, Anuj Mubayi. Modeling and Preparedness: The Transmission Dynamics of COVID-19 Outbreak in Provinces of Ecuador. 2020; Preprint
- ▶ **Jordy Cevallos-Chávez.** Concentration of infinitely many solutions of a nonlinear Schrödinger equation with critical frequency: Infinite Case. 2019; Bachelor's thesis, Universidad de Investigación de Tecnología Experimental Yachay.
- ▶ Devin Akman, Carlos Bustamante, **Jordy Cevallos-Chávez**, Cui-Hua Wang, Jordan Bates, Viswanathan Arunachalam, Leon M Arriola, Baojun Song. Modeling an Anthrax Plume: Prioritizing the Delivery of Antibiotics After an Anthrax Bioterrorism Event, 2018; Technical Report for MTBI 2018.

Research projects

- Spring 2023 **Quantifying the Impact of Sexual Behavior on HPV Transmission: A Mathematical Modeling Study** , *Arizona State University*, Tempe, Arizona, United States of America.
 We propose a mathematical model to study and quantify the impact of sexual behavior on Human Papiloma Virus (HPV) transmission.
- 2021-2022 **Human Robot Interaction and Trust in Automation**, *Arizona State University*, Tempe, Arizona, United States of America.
 We start a mathematical modeling of trust in automation and decision making prediction including physiological and behavioral data.
- Fall 2020 **Hierarchy Establishment from Nonlinear Social Interactions and Metabolic Costs: an Application to the *Harpegnathos saltator*.**, *Arizona State University*, Tempe, Arizona, United States of America.
 We constructed a compartmental model to predict the population and hierarchal dynamics of *H. saltator*, as well as to test the role of metabolic costs in the formation of shared hierarchies. We prove some basic properties of our system. We found that the metabolic cost factor of being a gamergate was found to be higher than the metabolic cost factor of being a worker. In fact, the system is sensitive to the metabolic cost factor of being a gamergate.
- Summer 2020 **Quantifying the impact of chronic lead toxicity on the American Bald Eagle (*Haliaeetus leucocephalus*) population in the Great Lakes Region**, *Arizona State University*, Tempe, Arizona, United States of America.
 To quantify the impact of lead-contaminated food sources on the bald eagle's population of the Great Lakes, we formulated a system of ordinary differential equations to show the progression through the stages of lead-toxicity and its role in the eagle's population dynamics. We compared the impact of the source of contamination verses treatment of lead-toxicity. We found the bald eagle population is sensitive to its source of lead-contamination.

- Spring 2020 **Social Distancing, Mobility Transmission Dynamics: The Trichotomy of COVID-19 Outbreak in Ecuador**, *Arizona State University*, Tempe, Arizona, United States of America.
We linked provincial-level demographic, epidemiological, and transportation information with the spread of COVID-19 outbreak to understand the role of local patterns of low and high-density provinces on the infection growth rate at the country level. The analysis is carried out using best (with no inter provincial movement) and worst (with movement patterns similar to before COVID-19 outbreak) case scenarios in Ecuador.
- Fall 2019 **Concentration of infinitely many solutions of a nonlinear Schrödinger equation with critical frequency: Infinite Case**, *Yachay Tech University*, Urcuquí, Imbabura, Ecuador.
We proved by a Lusternik–Schnirelman scheme (using the Kranoselskii genus) that the original problem has infinitely many solutions. We also prove multiplicity of solutions for the limit problem by using the same technique mentioned before. In fact, by the Kranoselskii's genus properties, the solutions found for the limit problem and original problem come in pairs for each critical level. Finally, we prove concentration results.
- Spring 2017 **Mathematical Modeling of Cracks in Rocks and Porosity**, *Yachay Tech University*, Urcuquí, Imbabura, Ecuador.
We studied the modeling of phenomena in the oil extraction and how the porosity and cracks influence in the oil extraction processes.
- 2015-2017 **Hemo-parasites in Birds of the North of Ecuador**, *Yachay Tech University*, Urcuquí, Imbabura, Ecuador.
We analyzed the existence of parasites in the blood of the birds. This project carried also the study of the biodiversity of birds in the North of Ecuador

Research and Teaching Experience

- Jan 2020–Present **Research Assistant**, *Simon A. Levin Mathematical, Computational and Modeling Sciences Center*, Tempe, Arizona, United States of America.
- Aug–Dec 2023 **Instructor**, *APM 253: Introduction to Mathematical Tools and Modeling for the Life and Social Sciences*, School of Human Evolution and Social Change, Arizona State University.
Tempe, Arizona, United States of America
- May–Aug 2023 **Teaching Assistant-Tutor**, *School of Human Evolution and Social Change*, Tempe, Arizona, United States of America.
- May–Aug 2022 **Teaching Assistant-Tutor**, *School of Human Evolution and Social Change*, Tempe, Arizona, United States of America.
- Jun–Jul 2021 **Tutor/Mentor**, *Quantitative Research for the Life and Social Sciences Program; Simon A. Levin Mathematical, Computational and Modeling Sciences Center*, Tempe, Arizona, United States of America.
- Jun–Jul 2020 **Tutor/Mentor**, *Mathematical and Theoretical Biology Institute; Simon A. Levin Mathematical, Computational and Modeling Sciences Center*, Tempe, Arizona, United States of America.
- Oct – Dec 2018 **Undergraduate Teaching Assistant**, *School of Mathematical and Computational Sciences*, Universidad de Investigación de Tecnología Experimental Yachay, Ecuador.
- Jan–May 2018 **Ad Honorem Undergraduate Teaching Assistant**, *Classes*, Universidad de Investigación de Tecnología Experimental Yachay, Ecuador.
- Oct – Dec 2017 **Undergraduate Teaching Assistant**, *School of Mathematical and Computational Sciences*, Universidad de Investigación de Tecnología Experimental Yachay, Ecuador.

- Jan–Jul 2017 **Ad Honorem Undergraduate Teaching Assistant**, *Classes*, Differential calculus, Integral Calculus and Ordinary Differential Equations, Universidad de Investigación de Tecnología Experimental Yachay.
- Jan-Dec 2016 **Ad Honorem Undergraduate Teaching Assistant**, *Classes*, Universidad de Investigación de Tecnología Experimental Yachay, Ecuador.

Conferences

International

- Oct 2023 **SACNAS National Diversity in STEM Conference (SACNAS NDiSTEM23)**. Portland Oregon.
- Nov 2022 **IV Jornadas de Matemáticas del Ecuador**
- Oct 2022 **ICMA-VIII 2022**
- Nov 2021 **International Symposium on Biomathematics and Ecology Education & Research (BEER)**
- Jan 2021 **NSF Student Conference on COVID-19 Modelling**
- Dec 2020 **II Jornadas de Matemáticas del Ecuador.**
- Nov 2020 **International Symposium on Biomathematics and Ecology Education & Research (BEER)**
- Aug 2020 **Society for Mathematical Biology Annual Meeting 2020**
- Dec 2019 **I Jornadas de Matemáticas del Ecuador.**

Arizona State University

- Mar 2023 **AMLSS Seminar** Quantifying the Impact of Sexual Behavior on HPV Transmission: A Mathematical Modeling Study
- Oct 2022 **AMLSS Seminar** Hierarchy Establishment from Nonlinear Social Interactions and Metabolic Costs: an Application to the *Harpegnathos saltator*
- July 2021 **Human Robot Interaction Research Group**. Electrodermal Activity (EDA) Data Analysis.
- Apr 2021 **Spring Research Symposium**. Mobility impact in the spreading of COVID-19 in Ecuador.
- Mar 2021 **AMLSS Seminar**. Hierarchy Establishment from Nonlinear Social Interactions and Metabolic Costs: an Application to the *Harpegnathos saltator*.
- Nov 2020 **Yun Kang's Laboratory Conference**. Hierarchy Establishment from Nonlinear Social Interactions and Metabolic Costs: an Application to the *Harpegnathos saltator*.
- Oct 2020 **AMLSS Seminar**. Modelling COVID-19 on Campus-Community.
- Sep 2020 **Computational Methods in Applied Mathematics for the Life and Social Sciences**. Introduction to Mathematica.
- Mar 2020 **AMLSS Seminar**. Social Distancing, Mobility Transmission Dynamics: The Trichotomy of COVID-19 Outbreak in Ecuador.

Extra-Curricular Activities

- April 2023–Present **GPSA Supreme Court Justice**, *Graduate and Professional Student Association*, Tempe, Arizona, United States of America.
- April 2022–Present **Vice president of the SIAM Student Chapter at Arizona State University.**

- May 2022–April 2023 **GPSA Assembly Member for the College of Liberal Arts and Science, Graduate and Professional Student Association, Tempe, Arizona, United States of America.**
- May 2021– May 2023 **President of the SIAM Student Chapter at Arizona State University.**
- Aug 2020– Dec 2021 **Workshops for Computational Methods in Applied Mathematics for the Life and Social Sciences Organizer.**
- Sep 2020– July 2021 **SIAM Student Chapter at Arizona State University Officer.**
- Jul 2019– Sep 2022 **Inaugural President and Chair of Alumni Yachay Tech, graduate association of the Universidad de Investigación de Tecnología Experimental Yachay.**
- Mar 2017– Feb 2019 **Head of students, delegate of the students to the Management Commission and Chair of the Student Council, Universidad de Investigación de Tecnología Experimental Yachay, Ecuador.**

Language Knowledge

- Spanish: Native
English: Sufficiency

Computer Skills

- Programming languages: Python, Matlab, R, Mathematica, L^AT_EX.
- Software: R studio, Matlab, Octave, Mathematica, Maxima.
- Operating systems: Linux, Windows, and Mac OS X.

Scientific Societies

- Society for Industrial and Applied Mathematics (SIAM)
- Society for Mathematical Biology (SMB)
- American Mathematical Society (AMS)
- Society for Advancement of Chicanos/Hispanics & Native Americans in Science (SACNAS)

Declaration

I hereby declare that the above mentioned information is correct up to my knowledge and I bear the responsibility for the correctness of the above mentioned particular.

Date: September 25, 2023

Place: Tempe, Arizona, United State of America

Jordy Cevallos Chavez