

## Jorge Rebaza's Vita

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**EDUCATION****Georgia Institute of Technology**

Atlanta, Georgia

Ph. D. in Applied Mathematics  
Graduation Date: 2002

**Universität Kaiserslautern**

Kaiserslautern, Germany

- Master's in Industrial Mathematics (Technomathematik)  
Graduation Date: 1994

**Universidad Nacional de Trujillo**

Trujillo, Peru

- Bachelor's in Mathematics  
Graduation Date: 1991

**APPOINTMENTS**

- Interim Department Head, Computer Science, Missouri State University, July 1, 2017 – July 31, 2018.
- Associate Dean (part-time), College of Natural and Applied Sciences, Missouri State University, June 1, 2015 – June 30, 2017.
- Professor of Mathematics, Missouri State University, since fall 2012.
- Associate Professor of Mathematics, Missouri State University, 2007-2012.
- Assistant Professor of Mathematics, Missouri State University, 2002-2007.

**PUBLICATIONS****BOOKS:**

**J. Rebaza**, “*Numerical Methods and Applications*”. Textbook manuscript. First draft has been completed. Currently at 585 pages, under final review by the author. It has been the textbook for MTH/CSC 421 and MTH/CSC 422 since fall 2015.

**J. Rebaza**, “*A First Course in Applied Mathematics*”. Wiley, New Jersey, 439 pages (2012). It has been the textbook for MTH 580/680 for the past nine years.

## RESEARCH ARTICLES (\* denotes student)

(In mathematics publications, authors are listed in alphabetical order)

1. K. Bessey\*, M. Davis\*, **J. Rebaza**, J. Zhang\*, “A general model and stability analysis of Zika virus”. Submitted (2018).
2. **J. Rebaza**, “Global stability of a multipatch waterborne disease epidemics model”. Submitted (2018).
3. S. Bates\*, H. Hutson\*, **J. Rebaza**, “Global stability of Zika virus dynamics”. Differential Equations & Dynamical Systems (2017). <https://doi.org/10.1007/s12591-017-0396-0>.
4. C. Cross\*, A. Edwards\*, D. Mercadante\*, **J. Rebaza**, “Dynamics of a networked connectivity model of epidemics”, Discrete and Continuous Dynamical Systems, Series B, 21 (2016), 3379-3390.
5. **J. Rebaza**, “Global stability of a networked connectivity model of disease epidemics”, Dynamics of Continuous, Discrete and Impulsive Systems, series B, 23 (2016), 239-250.
6. H. Larez, H. Leiva, **J. Rebaza**, A. Rios, “Approximate controllability of semilinear impulsive strongly damped wave equation”, J. of Applied Analysis, 21 (2015), 45-58.
7. A. Hare\*, **J. Rebaza**, “Dynamics of predator-prey models with refuge, harvesting, and dispersal”, Quaestiones Mathematicae, 38 (2014), 369-383.
8. **J. Rebaza**, “Bifurcations and periodic orbits in variable population interactions”, Comm. Pure & Applied Analysis 12 (2013), 2997-3012.
9. H. Larez, H. Leiva, **J. Rebaza**, “Approximate controllability of a damped wave equation”. Canadian Applied Mathematics Quarterly 20 (2012), 405-419.
10. T. Lara, **J. Rebaza**, “Dynamics of transitions in population interactions”. Nonlinear Analysis: Real World Applications 13 (2012), 1268-1277.
11. **J. Rebaza**, “Dynamics of prey threshold harvesting and refuge”. J. Computational and Applied Mathematics 236 (2012), 1743-1742.
12. A. Carrasco, H. Leiva, **J. Rebaza**, A. Moya, “Regularized evolution operators and applications”. J. of Mathematical Control Science and Applications 4 (2011), 33- 51.
13. B. Leard, **J. Rebaza**, “Analysis of predator-prey models with continuous threshold harvesting”. Applied Mathematics and Computation 217 (2011), 5265-5278.
14. J. Bohn\*, **J. Rebaza**, K. Speer\*, “Continuous threshold prey harvesting in predator-prey models”. International J. of Computational and Mathematical Sciences 5 (2011), 111-118.
15. A. Binder\*, **J. Rebaza**, “Multiple nonlinear eigenvalues of

- smooth rank-deficient matrices*". International J. of Numerical Analysis and Modeling B 1 (2010), 109-122.
16. P. Lenzini\*, **J. Rebaza**, "Nonconstant predator harvesting on ratio-dependent predator-prey models". Applied Mathematical Sciences 4 (2010), 791-803.
  17. S. Osborne\*, E. Wiggins\*, **J. Rebaza**, "On accelerating PageRank computation". Internet Mathematics 6 (2009), 157-171.
  18. J. Carreno, T. Lara, **J. Rebaza**, "On a model of American cutaneous leishmaniasis" Global J. of Pure and Applied Mathematics 3 (2009), 263-275.
  19. A. Acosta, H. Leiva, **J. Rebaza**, "A necessary and sufficient algebraic condition for the controllability of a strongly damped wave equation". Mathematical Sciences, 2 (2008), 223-242.
  20. B. Leard\*, K. Lewis\*, **J. Rebaza**, "Dynamics of ratio dependent predator-prey models with nonconstant harvesting". Discrete and Continuous Dynamical Systems, Series S 1 (2008), 303-315
  21. L. Gonzalez, S. Kilmer, **J. Rebaza**, "From a KKM theorem to Nash equilibria in  $L$ -spaces". Topology and its Applications, 155 (2007), 165-170.
  22. **J. Rebaza**, "Smooth Schur factorizations in the continuation of separatrices". Linear Algebra and its Applications, 421 (2007), 138-156.
  23. **J. Rebaza**, "Computation of Traveling waves via an algorithm for connecting orbits". Communications on Applied Nonlinear Analysis, 13 (2006), 43-59.
  24. **J. Rebaza**, "Uniformly distributed points on the sphere". Communications in Pure and Applied Analysis, 4 (2005), 389-403.
  25. L. Dieci, **J. Rebaza**, "Point-to-point and periodic-to-periodic connections". BIT, Numerical Mathematics 44 (2004), 41-62.

#### **MASTER'S THESIS ADVISOR**

- Advisee Zach Deskin, "On the Existence of Bogdanov-Takens Bifurcations". Fall 2016, spring 2017.
- Advisee Katharina Voelkel, "Modeling variable functional responses in population dynamics". Spring 2012, fall 2012.
- Advisee Justin Ricklefs, "Dynamics and bifurcations of a ratio-dependent competition model". Fall 2011, spring 2012.
- Advisee Jeremy Nation, "An introduction to singularity bifurcations". Fall 2004, spring 2005.

## **MASTER'S SEMINAR PAPER ADVISOR**

- Advisee Oana Nelson, “The Rayleigh-Ritz method in the approximation of eigenspaces”. Spring 2016.
- Advisee Chelsea Cozort, “A graph-theoretic method in global stability analysis”. Fall 2015.

## **GRANTS & FELLOWSHIPS**

- Sabbatical Leave, MSU, fall 2018.
- NSF-REU (Research Experiences for Undergraduates). Co-PI of grant funded by the National Science Foundation, aimed at involving undergraduates in high quality research, during the summers of 2016-2018, with Les Reid (PI), Xingping Sun, and Steven Senger. Total: \$293,661.
- Summer Faculty Fellowship, MSU 2015.
- NSF-REU (Research Experiences for Undergraduates). Co-PI of grant funded by the National Science Foundation, aimed at involving undergraduates in high quality research, during the summers of 2012-2014, with Les Reid (PI), and Xingping Sun. Total: \$298,255.
- Faculty Research Grant, MSU 2012. Total: \$4,230.
- Summer Faculty Fellowship, MSU 2011.
- NSF-STEP (Science, Technology, Engineering and Mathematics Talent Expansion Program). Co-PI of grant submitted to the National Science Foundation, aimed at increasing the number of graduates in STEM careers at MSU (2011). PI: T. Jahnke (CNAS). Not funded.
- NSF-CNH (Dynamics of Coupled Natural and Human Systems). Co-PI of grant submitted to the National Science Foundation, aimed at modeling demographic changes in central Jordan, related to land settlement and climate change (2011). PI: B. Walker (History, MSU). No funded
- Sabbatical Leave, MSU, spring 2010.
- NSF-SOLAR (Solar Energy Initiative). Co-PI of grant submitted to the National Science Foundation to support interdisciplinary research in highly efficient harvesting, conversion and storage of solar energy (2009). PI: S. Mitra (Physics, MSU). Not funded.
- NSF-REU (Research Experiences for Undergraduates). Co-PI of grant funded by the National Science Foundation, aimed at involving undergraduates in high quality research, during the summers of 2007-2009, with Les Reid (PI) and Cameron Wickham. Total: \$275,696.

- NSF-NCSA Large Scale Stochastic Matrix Computations. PI of grant that allowed supercomputer allocation at the National Center for Supercomputing Applications, at the University of Illinois, Urbana Champaign. 2008-2009.
- NSF-RUI (Research in Undergraduate Institutions). PI of grant submitted to the National Science Foundation to pursue research in dynamical systems (2005). Not funded.
- Teaching Fellowship. Co-PI of grant from Academic Development Center, MSU, 2005.
- Summer Faculty Fellowship. MSU 2005.

### **SYNERGISTIC ACTIVITIES**

- Faculty Sponsor of KME, Mathematics Honor Society, MSU, fall 2007 – spring 2017. Took KME to a higher level, with significant increase in student participation. Took students to present at regional and national conventions.
- Computer Science Department Head search committee member, fall 16-spring17
- Presidential Task Force on Globalization, 2014 – 2015
- Senate Ad-Hoc committee on “Issues in Higher Education”, 2011-2012.
- CNAS Recruitment Committee, 2011-2015.
- CNAS Scholastic Appeals committee, 2004-2006
- MSU Graduate Council, member, 2009-2011
- Mathematics Department Head search committee member, 2011
- Mathematics Faculty Search committee member, 2008
- Applied Mathematics committee chair, since 2005.
- Leading role in organizing the international “IX Americas Conference on Differential Equations and Nonlinear Analysis”, Peru 2012.
- Research advisor of several MSU mathematics undergraduates.
- Associate Editor of the journal Computational and Applied Mathematics (Springer), until 2016.
- Reviewer of the book: “A First Course on Numerical Analysis”, by U. Asher and C. Greif. SIAM.
- Reviewer of the book: “Advanced Calculus, A Transition to Analysis”, by J.B. Dence and T.P. Dence, Elsevier.
- Reviewer of the book: “Numerical Methods with MATLAB” 2<sup>nd</sup> Ed., by G. Recktenwald. Prentice Hall
- Reviewer of the book: “Numerical Analysis”, by T. Sauer. Addison-Wesley.
- Reviewer of the book: “Numerical Analysis and Scientific Computation”, by J. Leader. Addison-Wesley.

- Member of Scientific Committee of XXII Colloquium Peruvian Mathematical Society, 2014.
- Direct responsible for donations (computers, books, copiers, etc.) in favor of the Universidad de Trujillo (Peru), from the Deutsche Ausgleichbank, Germany.
- Direct responsible for obtaining and managing scholarships to Peruvian students to pursue graduate studies in Germany.
- Direct responsible for obtaining funding to support junior faculty at the Universidad de Trujillo (Peru) to attend international conferences.
- Featured on “Mind’s Eye”, fall 2015.
- Featured on KMSU radio interview, summer 2015.

## **PRESENTATIONS**

- XI Americas Conference on Differential Equations and Nonlinear Analysis, Edmonton, Canada. August 12-19, 2017. Contributed paper.
- X Americas Conference on Differential Equations and Nonlinear Analysis, Buenos Aires, Argentina. February 9-12, 2015. Contributed paper.
- CNAS Public Lecture Series, fall 2014.
- IX Americas Conference on Differential Equations and Nonlinear Analysis, Trujillo, Peru. January 9-14, 2012. Invited talk.
- Short courses and seminars on topics in Applied Mathematics, Trujillo, Peru. March 2010.
- VIII Americas Conference on Differential Equations and Nonlinear Analysis, Veracruz, Mexico. October 19-23, 2009. Invited talk.
- AMS Southeastern Sectional Meeting, University of Arkansas, Fayetteville, November 3-4, 2007.
- The 30th Anniversary of Postgraduate Studies in Mathematics, Universidad Central de Caracas, Venezuela. October 23-27, 2006. Invited talk.
- International Linear Algebra Society 12<sup>th</sup> Conference. Regina, Canada. June 26-29, 2005.
- Midwest Numerical Analysis Conference. University of Iowa. May 20-22, 2005.
- Joint Annual Meeting (AMS, MAA). Phoenix. January 7-10, 2004.
- Joint Meeting (SIAM, CAIMS). Montreal, Canada. June 16-20, 2003.
- Mathematics Seminar. University of Kansas. October 8, 2002. Invited talk.
- V Americas Conference on Differential Equations and Nonlinear

Analysis. Edmonton, Canada. July 7-12, 2002.

- Summer School at the University of Kaiserslautern, Germany. August 30 to September 24, 1999.
- Several local presentations at MSU: KME seminar, MAKO, CNAS Public Lecture Series, Faculty-Student seminar, MAA seminar, etc.

### **COMMUNICATION SKILLS**

- Spanish (Native Language).
- English (Fluent).
- German (Fluent).
- French (Basics).

### **OTHER ACTIVITIES**

- American Mathematical Society (AMS), member.
- Society for Industrial and Applied Mathematics (SIAM), member.

**Jorge Rebaza, Ph. D.**  
 Department of Mathematics  
 Missouri State University

### Workload Matrix

| Semester                   | F12 | S13 | F13 | S14 | F14 | S15 | F15 | S16 | F16 | S17 | F17 | S18 | F18 |
|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| UG teaching                | 9   | 9   | 8   | 8   | 6   | 3   | 6   | 3   | 6   | 3   | 3   | 3   |     |
| Graduate teaching          |     |     |     |     | 3   | 3   |     |     |     |     |     |     |     |
| MS Theses                  | 1   |     |     |     |     |     |     |     |     |     | 1   |     |     |
| MS Seminar Papers          |     |     |     |     |     |     | 1   | 1   |     |     |     |     |     |
| UG Student Research        |     | 1   | 1   |     |     |     |     |     | 1   |     | 1   |     |     |
| Sabbaticals                |     |     |     |     |     |     |     |     |     |     |     |     | ✓   |
| CNAS Associate Dean        |     |     |     |     |     |     | ✓   | ✓   | ✓   | ✓   |     |     |     |
| CS Interim Department Head |     |     |     |     |     |     |     |     |     |     | ✓   | ✓   |     |

- Full descriptions of departmental criteria for promotion to Professor are available at [https://www.missouristate.edu/assets/Provost/tp\\_deptguidelines\\_MTH.pdf](https://www.missouristate.edu/assets/Provost/tp_deptguidelines_MTH.pdf)
- Items designated with a double asterisk (\*\*) are highly valued activities.

### Research Matrix

**Departmental Criteria:** “Minimal expectations for consideration for promotion to Professor are two major publications of original work or major grants as an Associate Professor. Research achievements may include, but not be limited to, publications in refereed journals\*\*. Other scholarly activities include: research grants funded\*\*, publication of a book\*\*, and presentations of scholarly work at professional meetings.”

| Academic Year                      | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|------------------------------------|------|------|------|------|------|------|------|
| Published peer-reviewed articles** | 3    | 1    | 1    | 1    | 2    | 1    |      |
| Articles submitted for publication |      |      |      |      |      |      | 2    |
| NSF-REU grants** (includes summer) | 1    | 1    | 1    |      | 1    | 1    | 1    |
| Sabbaticals                        |      |      |      |      |      |      | 1    |
| Summer fellowships                 |      |      |      | 1    |      |      |      |
| Research merit evaluation score    | 4.5  | 5.0  | 5.0  | 5.0  | 5.0  | N/A  | N/A  |

(Research score: 5.0 is highest, 1.0 is lowest)

## Teaching Matrix

**Departmental Criteria:** *“Teaching effectiveness is measured based on several factors, including student evaluations\*\*, developed curriculum materials, seminar presentations to students, special reading courses, manuals and textbooks published\*\*, master’s theses directed\*\*, master’s seminar papers supervised\*\*, guidance of students making presentations at meetings and seminars, new course development\*\*, and teaching grants received\*\*. Student evaluation will be weighted up to a maximum of fifty percent in measuring teaching effectiveness. For promotion to Professor, faculty members are expected to participate in many, but not necessarily all, of the above-mentioned activities.”*

| Academic Year                       | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|-------------------------------------|------|------|------|------|------|------|------|
| Student evaluations average score** | 1.26 | 1.36 | 1.36 | 1.33 | 1.18 | 1.22 |      |
| Textbook manuscript                 |      |      |      |      |      |      | 1    |
| MS theses**                         | 1    |      |      |      |      | 1    |      |
| MS seminar papers**                 |      |      |      | 1    | 1    |      |      |
| Students making presentations       | 3    |      | 3    |      | 4    | 1    |      |
| Teaching merit evaluation score     | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | N/A  | N/A  |

(Teaching score: 5.0 is highest, 1.0 is lowest)

## Service Matrix

**Departmental Criteria:** *“For promotion to Professor a faculty member must demonstrate leadership in some area of service. This may include department, college, university, professional, and community service. Expectations of leadership include, but are not limited to, chairing at least one major committee, serving as faculty sponsor for a student organization or taking a leadership role in professional organizations or community service.”*

| Academic Year                            | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|------------------------------------------|------|------|------|------|------|------|------|
| Chair, departmental committee            | 1    | 1    | 1    | 1    | 1    |      |      |
| Member, departmental committee           | 3    | 3    | 3    | 3    | 3    |      |      |
| Member, college committee                | 1    | 1    | 1    | 1    |      |      |      |
| Member, university committee/task force  | 1    |      | 1    | 1    |      |      |      |
| Faculty sponsor of KME Honors Society    | ✓    | ✓    | ✓    | ✓    | ✓    |      |      |
| Associate editor of professional journal | ✓    | ✓    | ✓    | ✓    | ✓    |      |      |
| Service merit evaluation score           | 4.5  | 5.0  | 5.0  | N/A  | N/A  | N/A  | N/A  |

(Service score: 5.0 is highest, 1.0 is lowest)