CURRICULUM VITAE

CLAUDIO H. MORALES

February 2021

Abstract

EDUCATION : Ph. D. in Mathematics, The University of Iowa, 1980
Dissertation title: **"Fixed point theorems in nonlinear functional analysis: Condensing mappings and local strong pseudo-contractions.** Thesis supervisor: Professor William A. Kirk

M.S. in Statistics, January, 1981 The University of Iowa, Iowa City, Iowa

M.S. in Mathematics, March, 1974 Universidad Tecnica del Estado, Santiago, Chile Thesis title: "Meta-Abelian Rational Groups. Thesis supervisor: Professor Frank M. Markel

B.S. (with distinction) in Mathematics and Education Universidad de Chile, 1972, Santiago, Chile Thesis title: **"An Introduction to Banach Spaces Thesis supervisor: Professor Jose L. Perez**

RESEARCH INTERESTS : *Geometric fixed point theory in Banach spaces, nonlinear operator theory, differential and integral equations, history & philosophy of mathematics, mathematics education, and symbolic logic.*

LISTING OF GRADUATE STUDENTS Committee Chairman of: (with thesis)

1. Jianchao Zhu, M.A. in Mathematics, 1985, thesis title: "On Linear Differential Equations with functionally commutative coefficient matrices.

2. Timothy L. Brown, M.A. in Mathematics, 1987, thesis title: "Solvability of Nonlinear Functional Equations of the form Tx = 0 for Demicontinuous Operators.

3. Philip Burton, M.A. in Mathematics, 1987,thesis title: "A Relationship between Differential Equations and Accretive Operators.

4. Marcus Pendergrass, M.A. in Mathematics, 1991,thesis title: The Saddle-node Property, with Applications to System from Population Biology.

5. Cindy Wells, M.A. in Mathematics, 1994, monograph title : "Some Fundamental Results for Uniformly Convex Spaces.

6. Irfan Ul-haq, M.A. in Mathematics, 1998, thesis title: Fixed Point Theorems for Pseudo-contractive mappings in Banach spaces.

7. Blane Hollingsworth, M.A. in Mathematics, 2001, thesis title: Degree Theory and the Measure of Noncompactness

8. Anthony Hester, M.A. in Mathematics, 2005 Thesis title: The Pettis Integral with Applications to Ordinary Differential Equations and Fixed Point Theory

9. Shushannah Smith, M.A. in Mathematics, 2001, currently pursuing a Ph. D. in Mechanical and Aerospace Engineering at UAH.

10. Bob Berinato, M.A. in Mathematics, 2007 (non thesis)

11. Toanl Nguyen, M.A. in Mathematics, 2011 (non thesis)

12. Michael Slanovits, M.A. in Mathematics/Education, 2012 (non thesis)

PH. D. STUDENTS

Myrtis L. Lunsford, 1995, dissertation title: Existence Results for Generalized Variational Inequalities.

Anthony Hester, 2007, dissertation title: Semigroups Generated by Pseudo-Contractive Mappings under the Nagumo Condition.

Current Master degree (with thesis) student : Quinten R. McKenney, 2021

PROFESSIONAL AFFILIATIONS: American Mathematical Society, Chilean Mathematical Society

ASSOCIATE EDITOR FOR : The Journal of Nonlinear Functional Analysis and Differential Equations, since 2005
Associate editor for The Journal of Operators, since 2012
Associate editor for The Journal of Scientia, since 2014.

REVIEWER FOR: Mathematical Reviews, 1980-present

REFEREE FOR: The Proceedings of the American Mathematical Society
The Journal of Nonlinear Analysis: Theory, Methods, and Applications.
The Journal of Mathematical Analysis and Applications.
The International Journal: Computers & Mathematics The Applied Mathematics Letter
The Journal of Fixed Point Theory & Applications
The Journal of the Nigerian Mathematical Society.

PUBLICATIONS :

1. "Condensing Mappings and the Leray-Schauder Boundary Condition (with W.A. Kirk), Journal of Nonlinear Analysis, 3(1979), 533-538

2, "Pseudo-contractive Mappings and the Leray-Schauder Boundary Condition, Comment. Math. Univ. Carolin, 4(1979), 745-756.

3. "Fixed Point Theorems for Local Strong Pseudo- contractions (with W.A. Kirk), Journal of Nonlinear Analysis, 4(1981), 363-368.

4. "On the Fixed Point Theory for Local k-Pseudo-contractions, Proc. Amer. Math. Soc., 81(1981), 71-74.

5. "On the Approximation of Fixed Points of Locally Nonexpansive Mappings (with W.A. Kirk), Canad. Math. Bull., 24(1981), 441-445.

6. "Remarks on Pseudo-contraction Mappings, J. Math. Anal. and Appl., 87(1982), 158-164.

7. "Set-Valued Mappings in Banach Spaces, Houston Journal of Math. 9(1983), 245-253.

8. "Nonlinear Equations involving m-Accretive Operators, J. Math. Anal. and Appl., 97(1983), 329-336.

9. "Existence Theorems for Demicontinuous Accretive Operators in Banach Spaces, Houston Journal of Math., 10(1984), 535-543.

10. "Zeros for Accretive Operators Satisfying Certain Boundary Conditions, J. Math. Anal. and Appl., 105(1985), 167-175.

11. "Surjectivity Theorems for Multi-Valued Mappings of Accretive Type, Comments. Math. Univ. Carolinae, 26(1985), 397-413.

12. "Angular Momentum and Photocurrent Threshold for the Solvated Electron (with J.K. Baird), J. Phys. Chem., 89(1985), 774-776.

13. "Zeros for Strongly Accretive Set-Valued Mappings, Comments. Math. Univ. Carolinae, 27(1986), 455-469.

14. "Mapping Theorems for Multi-Valued Operators of Accretive Type, Revista Notas Soc. Mat. Chile, 6(1987), 101-113.

15. "Spatial Decomposition of Functionally Commutative Matrices? (with J. Zhu), Linear Algebra and its Applications, 131(1990), 71-92.

16. "Strong Convergence Theorems for Pseudo-Contractive Mappings in Banach Spaces, Houston Journal of Mathematics, 16(1990), 549-558.

17. "Remarks on Compact Perturbations of m-Accretive Operators, The Journal of Nonlinear Analysis, 16 (1991), 771-780.

18. "On Linear Ordinary Differential Equations with Functionally Commutative Coefficient Matrices (with J. Zhu), Journal of Linear Algebra and its Applications, 170(1992), 81-105.

19. "On the Range of Sums of Accretive and Continuous Operators in Banach Spaces, The Journal of Nonlinear Analysis, TMA, 19 (1992), 1-9.

20. "Multivalued Pseudo-Contractive Mappings defined on Unbounded Sets in Banach Spaces, Comments. Math. Univ. Carolinae, 33(1992), 625-630.

21. "On the Approximation of Fixed Points for Locally Pseudo-contractive Mappings, (with S.A. Mutangadura), Proc. Amer. Math. Soc. 123(1995), 417-423.

22. "On a Fixed Point Theorem of Kirk, (with S.A. Mutangadura), Proc. Amer. Math. Soc. 123(1995), 3397-3401.

23. "Locally Accretive Mappings in Banach Spaces, The Bulletin of the London Math. Soc., 28 (1996), 627-633.

24. "On the Approximation of Zeros for Locally Accretive Operators, Lecture Notes in Pure and Applied Mathematics: Theory and Applications of Nonlinear Operators of Accretive and Monotone type, edited by A.G. Kartsatos, vol. 178, 1996.

25. "Approximation of Fixed Points for Locally Nonexpansive Mappings, Workshop in Fixed Point Theory, Poland, 1997.

26. "A generalization of Bolzano's Theorem, Alabama Journal of Mathematics, 23 (1999), 3-13.

27. "Convergence of the Steepest Descent Method for Accretive Operators", (with C.E. Chidume), Proc. Amer. Math. Soc. 127 (1999), 3667-3683.

28. "Convergence of Paths for Pseudo-contractive Mappings in Banach spaces, (J. S. Jung), Proc. Amer. Math. Soc. 128 (2000), 3411-3419.

29. "The Mann Process for Perturbed m-accretive Operators in Banach spaces, (with J. S. Jung), Journal of Nonlinear Analysis, TMA, 46 (2001), 231-243.

30. "A Bolzano Theorem in the New Millennium, Nonlinear Analysis, TMA, 51(2002), 679-691.

31. "Nonexpansive mappings: boundary/inwardness conditions and local theory. Handbook of metric fixed point theory, 299-321, Kluwer Acad. Publ., Dordrecht, 2001.

32. "Existence Theorems for Strongly Accretive Operators in Banach Spaces, SIMAA 4(2002), 361-368. 2002 Taylor & Francis.

33. "The Aftermath of the Intermediate Value Theorem, (with Raul Fierro and Carlos Martinez), Journal of Fixed Point Theory and Applications, 3 (2004), 243-250.

34. "Existence Theorems for m-Accretive Operators in Banach Spaces (with Jesus Garcia-Falset), J. Math. Anal. Appl., 309 (2005), 453-461.

35. "Strong Pseudo-contractions Perturbed by Compact Operators in Banach Spaces, Proc. Amer. Math. Soc., 133 (2005), 3613-3618.

36. "Compact Perturbations of m-Accretive Operators in Banach Spaces, Proc. Amer. Math. Soc., 134 (2006), 365-370.

37. "Fixed Point Theorems under the Interior Condition, (with Antonio Jimenez-Melado), Proc. Amer. Math. Soc., 134 (2006), 501-507.

38. "Caratheodory Selections for Multivalued Mappings, (with R. Fierro and C. Martinez), Nonlinear Analysis, 64 (2006), 1229-1235.

39. "Strong convergence of path for continuous pseudo-contractive mappings, Proc. Amer. Math. Soc. 135 (2007), no. 9, 2831-2838.

40. "Accretive operators which are always single-valued in normed spaces, (with C. E. Chidume) Nonlinear Anal. 67 (2007), no. 12, 3328-3334.

41. "Semigroups Generated by Pseudo-Contractive mappings under the Nagumo Condition, (with A. Hester), J. Differential Equations, 245 (2008), 994-1013.

42. "The Leray-Schauder Condition for Continuous Pseudo-Contractive Mappings, Proc. Amer. Math. Soc., 137 (2009), 1013-1020.

43. "Random Fixed Point Theorems for Lower Semi-Continuous Mappings, (with R. Fierro and C.

Martnez), Fixed Point Theory and Applications, vol. 9, 2009.

44. "A Random Coincidence result and some consequences, (with R. Fierro and C. Mart ìnez), J. Math. Anal. Appl. 378 (2011), no. 1, 213219.

45. "Fixed Point Theorems for Random Pseudo-contractive Mappings, Nonlinear Anal. 74 (2011), no. 13, 43794386.

46. "Variational Inequalities for phi-pseudocontractive mappings, Nonlinear Anal. 75 (2012), no. 2, 477–484

47. "The invariance of domain for k-set-pseudo-contractive operators in Banach spaces, (with A. Udomene), Taiwanese J. of Mathematics, 18(2014), 1827-1839.

48. "Iterative Methods and Applications (with G. Marino etal.) J.Appl. Math. Editorial, 2014.

49. "Monotonicity beyond Minty and Kato on in locally convex spaces, (with P. Gajardo and J. Peypouquet), J. Math. Anal. Appl. 435(2016), 1701-1709.

50. "Fixed point approximation under Mann Iteration beyond Ishikawa, (with A. Hester), Comment. Math. Univ. Carolin. 61, 3 (2020), 265–275.

51. "Existence of fixed points involving the difference of two nonlinear operators, submitted for publication, 2021.

52. "Surjectivity for monotone operators in Banach spaces, (with P. Gajardo and J. Peypouquet), pre-print.

53. "Mann iteration beyond continuous mappings in normed spaces, (with A. Hester), pre-print.

OTHER PUBLICATIONS:

Book review of Theorems of Leray-Schauder Type and Applications, by Donal ORegan and Radu Precup, 2004, Mathematical Reviews.

Book review of Iterative Approximation of Fixed Points, by Vasile Verinde, 2004, Mathematical Reviews.

Book review of Analysis with an introduction to proofs, by Steven Lay, 2011, Pearson/Prentice Hall.

RESEARCH PRESENTATIONS : **Invited Talks**

"Exploring the positive definite property for monotone operators in infinite dimensional spaces", Southeastern Conference, North Carolina State University, Raleigh, NC, Nov. 2016.

"Surjectivity results for monotone operators under a boundary condition in Hilbert spaces", the annual Joint mathematical meeting of UAH, UAB and UA, Oct. 2015.

"Monotone operators and the Hammerstein equation in reflexive Banach spaces", Southeastern AMS Conference, University of Memphis, Memphis, Oct. 2015.

Monotonicity and the solvability of Hammerstein equations in Hilbert spaces, Universidad Federico Santa Maria, Valparaiso, August 2015.

"Maximal monotone operators in locally convex spaces", Southeastern AMS conference, UAH, March 2015.

"Exploring monotone operators in higher dimension", Department of Mathematics, University of Alabama in Huntsville, Nov. 2014.

"Infinity: from Aristotle to Cantor", honors students at UAH, 2012.

"Fallacies in the teaching of mathematics", University of Santiago, Chile, 2011

"Fixed Points for multi-valued random operators", Universidad Federico Santa Mara,
Valparaiso, Chile, September 2009.

"On the Theory of Monotone operators for General Banach Spaces", University of Chile, Santiago, Chile, November 2009.

"Convergence result for an implicit scheme on Pseudo-Contractive mappings defined in Banach Spaces", Auburn University, June 2005.

"A First Look into Monotone Operators in Hilbert Spaces", Longwood University, Farmville, Virginia, March 2005.

"Una mirada a un Teorema de Bolzano en el nuevo Milenio". IMA, PUCV, August 2004.

"Fixed Point Theorems for Condensing Mappings under the Leray-Schauder Boundary Condition", The International Centre for Theoretical Physics, May 2003.

"The Aftermath of the Intermediate Value Theorem", The International Centre for Theoretical

Physics, May 2002.

"A Fresh Look at an Old Condition for Solving Equations", The International Conference on Fixed Point Theory and its Applications, Haifa, Israel, June 2001.

"A view on Monotone Operators in Reflexive Banach spaces", The Fifth International Conference on Nonlinear Functional Analysis and Applications, Kyungnam University, Masan, South Korea, July 1999.

"Convergence to Fixed Points of Locally Nonexpansive Mappings", Workshop on Fixed Point Theory, Kazimierz, Poland, June 1997.

"Existence of Zeros for Infinite Dimensional Spaces under Certain Boundary Conditions on the domain of definition", University of Granada, Granada, Spain, April 1997.

"Study of the Duality Mapping and its Relationship with Monotone-type Operators in Banach Spaces", University of Seville, Seville, Spain, March 1997.

"On the Solvability of Nonlinear Functional Equations Involving Accretive Operators", National Mathematical Centre, Abuja, Nigeria, Dec. 1995.

"A view of Nonlinear Operator Theory", University of Seville, Seville, Spain, May 1995.

"On the approximation of zeros for locally accretive operators in Banach spaces", The annual meeting of the American Mathematical Society, San Francisco, CA, Jan. 1995.

"Ms all de las Contracciones en Espacios de Banach", Universidad Tcnica Federico Santa María, Aug. 1994.

"On the Approximation of Fixed Points for Nonlinear Operators in Banach Spaces", Fourth Chilean Mathematical Symposium, Santiago, Chile, Sept. 1993.

"On the theory of m-accretive operators and the theory of partial differential equations", Second Latino-American Congress in Analysis, Bogota, Colombia, Nov. 1992.

"On the range of sums of accretive operators in Banach spaces", First World Congress of Nonlinear Analysts, Tampa, Florida, USA, Aug. 1992

"Existence Theorems Involving Accretive Operators in Banach Spaces", University of Regina, Canada, Mar. 1990.

"Invariance of Domain Theorem for Demi-continuous Mappings in Banach Spaces", the 64th annual

meeting of the Alabama Academy of Science, Florence, Apr. 1987.

"Solvability of nonlinear equations involving monotone operators", Second Chilean Mathematical Symposium, Chile, Dec. 1985.

"Solvability of Functional Equations in Banach Spaces", University of South Florida, Nov. 1985.

"Nonlinear Operators Satisfying Boundary Conditions", regional meeting of the American Mathematical Society, March 1983.

"Finding Zeros for Accretive Operators", Southwest Texas State University, Nov. 1981.

"Remarks on Pseudo-Contractive Mappings", First Annual Conference of Mathematics, Pan American University, March 1981.

"The generalized Leray-Schauder condition on Condensing and pseudo-contractive mappings in Banach spaces", the annual meeting of the American Mathematical Society, San Francisco, CA, Jan. 1981.

TEACHING EXPERIENCE:

1. Teacher of Mathematics and Physics, high school in Santiago, Chile, 1965-1967
2. Instructor of Mathematics, Universidad Tecnica del Estado, Santiago, Chile, 1967-1968
3. Teaching Assistant of Mathematics, Universidad de Chile, Santiago, Chile, 1968-1971.
4. Assistant Professor of Mathematics, Universidad de Chile, Santiago, Chile, 1971-1973
5. Research Assistant of Mathematics, Univ. Tecnica del Estado, Santiago, Chile, 1974-1975
6. Teaching Assistant of Mathematics, University of Iowa, Iowa City, Iowa, 1975-1980
7. Assistant Professor of Mathematics, Pan American University, Edinburg, Texas, 1980-1982
8. Assistant Professor of Mathematics, University of Alabama in Huntsville, 1982-1986
9. Associate Professor of Mathematics, University of Alabama in Huntsville, 1987-1992
10. Professor of Mathematics, University of Alabama in Huntsville, 1993-present.

ADDITIONAL TEACHING EXPERIENCE

1. A short course in Higher Mathematics for children of 10 to 13 year of age, Continuing Education, UAH, Summer 1984.

2. An intensive short course in Fourier Series for NASA, Continuing Education, UAH, September 1985.

3. A 3-week course in Critical Thinking for talented kids, organized By John Hopkins University, Summer 2002.

4. Workshop in How to Study Mathematics, Instituto de Matemticas, Pontificia Universidad Catlica

de Valparaiso, August 2004.

5. Summer Workshops in Euclidean Geometry for Middle and High School teachers, 2005-2007

6. Mentor for a NASA program to help minority students, 2009-present.

In the area of teaching, I have contributed in various different directions; I have taught about 15 different undergraduate courses and about 8 different graduate courses. I have created a number of these courses including the Foundations of Mathematics course, which is a required course for all undergraduate majors at UAH. In addition, I have designed additional courses such as: Introduction to Number Theory, Point-Set Topology, Introduction to Hilbert Spaces, Differential Geometry and a course for honors students on the History and Philosophy of Mathematics. Years ago, I designed a rigorous course that I simply call Undergraduate Research. In this intensive course, each student had to work a particular mathematical problem, that in some cases, the solution was unknown. During the course of the semester, we met as a group to discuss the progress of each one by questioning his or her presentation. This activity generated a very health and enriching learning environment. This was an excellent experience for all participants, and I was glad to observe the success of several of my former students. Two of them already finish their Ph. D. and another went to graduate school. In addition to developing courses, I have also created a fairly complete class notes for various courses, which will likely be used as part of future textbooks.

Few years, I have worked in a MECESUP directed by Professor Gladys Bobadilla (USACH) to identify avenues to improve the quality of teaching mathematics at th undergraduate level for entrance students, as well as, finding proper curricular changes to assure a better success among engineering students.

Most recently, I have written an NSF proposal entitled :"Exploring a Liberal Arts Approach to Learning Mathematics" (with one of my former Ph. D. student Anthony Hester). As the title says, we combine to different methodologies : the liberal arts approaches with the so-called problem-based learning.

PRESENTATIONS ON MATHEMATICS EDUCATION

"Open question in Number Theory : An exciting way to learn mathematics", Department of Physics, University of Alabama in Huntsville, Nov. 2016.

"An intuitive explanation of Dirac delta-function, that is not a function", Department of Physics, University of Alabama in Huntsville, Nov. 2014.

"The beauty in mathematics", High school in a town near Santiago, Chile, August 2013.

"Falacias en la ensenanza de las matemáaticas", Departamento de Matematicas, USACH, 2011

"A World of Imagination, Curiosity and Creative Thinking", Honors Forum, October 2010.

"La esencia en la formación de pedagogos para un furturo mejor", PUCV, Octubre 2009.

"Formación de un Pedagogo en Matemáticas", Segundo Congreso de estudiantes de Pedagogia en Matemticas, USACH, Octubre 2009.

"Formación de Ingenieros en Huntsville", UTFSM, Septiembre 2009.

"Las matemáticas pueden ser entretenidas", Elementary School, Puente Alto, Santiago, Chile, August 2008.