Curriculum Vitae

Kyriakos G. Mavridis

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Contact and Biographic Information

Date of Birth :	26 January 1978
Nationality ..:	Greek
Job Address .:	University of Ioannina, P.O. Box 1186, Department of Mathematics, Office 509e, 45110 Ioannina, Greece
Phone ....:	+30 2651008237 (office) (mobile available upon request)
eMail ....:	kyriakos.g.mavridis@gmail.com (preferred for all purposes) kmavridi@uoi.gr (job)
WebSite .....:	http://users.uoi.gr/kmavridi/

Academic Education

- Ph.D. in Pure Mathematics (Mathematical Analysis), University of Ioannina, Greece (grade "Excellent", October 2006).
- M.Sc. in Pure Mathematics (Mathematical Analysis), University of Ioannina, Greece (November 2001).
- B.Sc. in Mathematics, University of Ioannina, Greece (grade 7.62/10, July 1999).

Academic Career and Teaching Experience

- From the academic year 2013–2014 until now, I am a Lecturer at the Department of Mathematics, University of Ioannina, Greece.
  - ▷ I teach postgraduate classes as well as undergraduate classes. These classes include compulsory and elective courses, at least two classes per semester, at the Department of Mathematics as well as other departments.
  - ▷ I supervised a postgraduate student, who has successfully received her degree.

- ▷ The official annual evaluation processes contacted by the University of Ioannina, regarding the students' opinion about their experience in my classes, are constantly positive over time.

- During the academic years 2012–2013, 2010–2011, 2009–2010 and 2008–2009, I was a Visiting Lecturer at the Department of Mathematics, University of Ioannina, Greece.

Reviewing Experience

I have reviewed manuscripts for various journals, published by well known publishing companies and universities. Also, I have reviewed articles for the "AMS Mathematical Reviews" (Reviewer Number: 37332).

Conferences

- Twenty minutes talk in the International Conference on the Theory, Methods and Applications of Nonlinear Equations, Texas A&M University - Kingsville, USA (17 - 21 December 2012).
- Poster in the Nonlinear Analysis and Differential Equations Meeting in Glasgow University, Glasgow, United Kingdom (1 - 4 June 2010).

Language and IT Skills

- "Certificate of Proficiency in English", Cambridge University.
- "First Certificate in English", Cambridge University.
- TeX, LMS, PHP, Python, HTML+Javascript, Maxima, Mathematica, Inkscape, Office Suites.

Published Papers

The citations mentioned bellow do not include papers by any of my co-authors in any of my publications.

1. K.G. Mavridis, Existence of positive solutions for a class of arbitrary order boundary value problems involving nonlinear functionals, *Ann. Pol. Math.* 112.3 (2014), 313-327.
2. K.G. Mavridis and P.Ch. Tsamatos, Conditions for the existence of positive solutions covering a class of boundary value problems in a uniform way, *Nonlinear Anal.* 75 (2012), Issue 10, 4104-4113.
3. K.G. Mavridis and P.Ch. Tsamatos, Existence of positive solutions of a terminal value problem for second order differential equations, *Commun. Appl. Anal.* 15 (2011), No. 2, 3 and 4, 539-546.

4. K.G. Mavridis and P.Ch. Tsamatos, Existence results for a functional boundary value problem on an infinite interval, *Funk. Ekv.* 54 (2011), 53-68.

5. K.G. Mavridis, Two modifications of the Leggett-Williams fixed point theorem and their applications, *Electron. J. Differential Equations* 53 (2010), 1-11.

   Number of citations: **9**.

   (i) R. Avery, J. Graef and X. Liu, Compression fixed point theorems of operator type, *Journal of Fixed Point Theory and Applications*, 2015, 17(1), 83-97.

   (ii) A. Dogan, Existence of positive solutions for $p-$Laplacian an $m-$point boundary value problem involving the derivative on time scales, *Electronic Journal of Differential Equations*, 2014(37), 1-10.

   (iii) C. Seelbach, *Applications Of Leggett Williams Type Fixed Point Theorems To A Second Order Difference Equation*, Thesis, 2013.

   (iv) D. Anderson, R. Avery, J. Henderson and X. Liu, Fixed point theorem utilizing operators and functionals, *Electron. J. Qual. Theory Differ. Equ.* 12 (2012), 1-16.

   (v) D. Anderson, R. Avery, J. Henderson and X. Liu, Multiple fixed point theorems utilizing operators and functionals, *Communications in Applied Analysis* 16(3) (2012), 377-388.

   (vi) J. Neugebauer and C. Seelbach, Positive symmetric solutions of a second-order difference equation, *Involve* 5 (2012), no. 4, 497504.

   (vii) D. Anderson, R. Avery, J. Henderson and X. Liu, Existence of Positive Solutions of a Second Order Right Focal Boundary Value Problem, *Communications in Applied Analysis* 18(3) (2011), 41-52.

   (viii) D. Anderson, R. Avery, J. Henderson and X. Liu, Multiple fixed point theorems of operator type, *Int. Electron. J. Pure Appl. Math.* 3 (2011), No. 2, 173-185.

   (ix) D. Anderson, R. Avery, J. Henderson and X. Liu, Operator type expansion-compression fixed point theorem, *Electron. J. Differential Equations* 42 (2011), 1-11.

6. K.G. Mavridis, Ch.G. Philos and P.Ch. Tsamatos, Multiple positive solutions for a second order delay boundary value problem on the half-line, *Ann. Polon. Math.* 88 (2006), 173-191.

   Number of citations: **1**.

   (i) Y. Wei and P. Wong, Existence and uniqueness of solutions for delay boundary value problems with $p-$Laplacian on infinite intervals, *Bound. Value Probl.* 2013(141), 13 pp.

7. K.G. Mavridis, Ch.G. Philos and P.Ch. Tsamatos, Existence of solutions of a boundary value problem on the half-line to second order nonlinear delay differential equations, *Arch. Math. (Basel)* 86 (2006), 163-175.

   Number of citations: **6**.

   (i) Y. Wei and P. Wong, Existence and uniqueness of solutions for delay boundary value problems with $p-$Laplacian on infinite intervals, *Bound. Value Probl.* 2013(141), 13 pp.

   (ii) Y. Wei, Y. Tang and W. Ge, Multiple positive solutions to boundary value problems of delay differential equations with denumberable singularities on infinite interval, *Ann. Differential Equations* 27 (2011), no. 2, 222-227.

   (iii) Y. Wei and W. Ge, Three positive solutions for delay differential equation BVPs with $p-$Laplacian on infinite interval, *J. Appl. Math. Comput.* 33 (2010), no. 1-2, 47-59.

   (iv) Y. Wei, P.J.Y. Wong and W. Ge, The existence of multiple positive solutions to boundary value problems of nonlinear delay differential equations with countably many singularities on infinite interval, *J. Comput. Appl. Math.* 233 (2010), no. 9, 2189-2199.

   (v) Y. Wei, Existence and uniqueness of solutions for a second-order delay differential equation boundary value problem on the half-line, *Bound. Value Probl.* 2008, Art. ID 752827, 1-14.

   (vi) Y. Wei, B. Du and W. Ge, Existence of solutions for second-order delay boundary value problem on the half-line, *Journal of Xuzhou Normal University (Natural Science Edition)*, 2 (2008), 26-29.

8. K.G. Mavridis and P.Ch. Tsamatos, Two positive solutions for second order functional and ordinary boundary value problems, *Electron. J. Differential Equations* 82 (2005), 1-11.

   Number of citations: **2**.

   (i) S. Xi, M. Jia and H. Ji, Multiple positive solutions for boundary value problems of second-order differential equations system on the half-line, *Electron. J. Qual. Theory Differ. Equ.* 2010, no. 17, 1-15.

   (ii) R. Liang, J. Peng and J. Shen, Two positive solutions for a nonlinear four-point boundary value problem with a $p-$Laplacian operator, *Electron. J. Qual. Theory Differ. Equ.* 2008, no. 18, 1-10.

9. K.G. Mavridis and P.Ch. Tsamatos, Positive solutions for first order nonlinear functional boundary value problems on infinite intervals, *Electron. J. Qual. Theory Differ. Equ.* 8 (2004), 1-18.

   Number of citations: **2**.

   (i) M. Benchohra, J. Henderson, S.K. Ntouyas and A. Ouahab, Boundary value problems for impulsive functional differential equations with infinite delay, *Int. J. Math. Comput. Sci.* 1 (2006), no. 1, 23-35.

(ii) J.R. Graef and A. Ouahab, Some existence and uniqueness results for first-order boundary value problems for impulsive functional differential equations with infinite delay in Frechet spaces, *Int. J. Math. Math. Sci.* 2006, Art. ID 31256, 1-16.

10. K.G. Mavridis and P.Ch. Tsamatos, Positive solutions for a Floquet functional boundary value problem, *J. Math. Anal. Appl.* 296 (2004), 165-182.

Number of citations: **3**.

(i) Y. Zhou, Y. Tian and Y. He, Floquet boundary value problem of fractional functional differential equations, *Electron. J. Qual. Theory Differ. Equ.* 2010, no. 50, 1-13.

(ii) X.H. Tang and Z. Jiang, Periodic solutions of first-order nonlinear functional differential equations, *Nonlinear Anal.* 68 (2008), no. 4, 845-861.

(iii) M. Benchohra, J. Henderson, S.K. Ntouyas and A. Ouahab, Boundary value problems for impulsive functional differential equations with infinite delay, *Int. J. Math. Comput. Sci.* 1 (2006), no. 1, 23-35.

11. G.L. Karakostas, K.G. Mavridis and P.Ch. Tsamatos, Triple solutions for a nonlocal functional boundary value problem by Leggett-Williams theorem, *Appl. Anal.* 83 (2004), 957-970.

Number of citations: **5**.

(i) J. Liang and Z.W. Lv, Solutions to a three-point boundary value problem, *Adv. Difference Equ.* 2011, Art. ID 894135, 1-20.

(ii) P. Wong, Multiple fixed-sign solutions for a system of higher order three-point boundary-value problems with deviating arguments, *Comput. Math. Appl.* 55 (2008), no. 3, 516-534.

(iii) J. Henderson and S.K. Ntouyas, Positive solutions for systems of nonlinear eigenvalue problems for functional differential equations, *Appl. Anal.* 86 (2007), no. 11, 1365-1374.

(iv) K.L. Boey and P.J.Y. Wong, Existence of triple positive solutions of two-point right focal boundary value problems on time scales, *Comput. Math. Appl.* 50 (2005), no. 10-12, 1603-1620.

(v) P. Wong, Multiple fixed-sign solutions for a system of difference equations with Sturm-Liouville conditions, *J. Comput. Appl. Math.* 183 (2005), no. 1, 108-132.

12. G.L. Karakostas, K.G. Mavridis and P.Ch. Tsamatos, Multiple positive solutions for a functional second-order boundary value problem, *J. Math. Anal. Appl.* 282 (2003), 567-577.

Number of citations: **8**.

(i) C. Bai, Existence of positive solutions for a functional fractional boundary value problem, *Abstr. Appl. Anal.* 2010, Art. ID 127363, 1-13.

(ii) F.H. Wong, S.P. Wang and T.G. Chen, Existence of positive solutions for second order functional differential equations, *Comput. Math. Appl.* 56 (2008), no. 10, 2580-2587.

(iii) J. Henderson and S.K. Ntouyas, Positive solutions for systems of nonlinear eigenvalue problems for functional differential equations, *Appl. Anal.* 86 (2007), no. 11, 1365-1374.

(iv) C. Bai, Triple positive solutions for boundary value problems of second-order functional differential equations, *Journal of Southwest China Normal University (Natural Science Edition)*, 1 (2006), 44-47.

(v) C. Bai and X. Xu, Positive solutions for a functional delay second-order three-point boundary-value problem, *Electron. J. Differential Equations* 2006, no. 41, 1-10.

(vi) C. Bai, Q. Yang, and J. Ge, Existence of positive solutions for boundary value problems for singular higher-order functional differential equations, *Electron. J. Differential Equations* 2006, no. 68, 1-11.

(vii) Z. Du, C. Xue and W. Ge, Triple solutions for a higher-order difference equation, *JIPAM. J. Inequal. Pure Appl. Math.* 6 (2005), no. 1, Article 10, 1-11.

(viii) S.J. Yang, B. Shi and M.J. Gai, Boundary value problems for functional differential systems, *Indian J. Pure Appl. Math.* 36 (2005), no. 12, 685-705.

Dissertations

- "Boundary value problems for nonlinear functional differential equations - Existence of positive solutions", University of Ioannina, Greece, 2006 (Ph.D. degree thesis).

- "From a three-point to a nonlocal boundary value problem for second order differential equations - Research results from 1992 to 2001", University of Ioannina, Greece, 2002 (M.Sc. degree thesis).

Research Interests

Mathematics Subject Classification (2000): 47H10, 34B40, 34K10, 34B18.

- Differential Equations: ordinary and functional differential equations, fractional differential equations.

- Boundary Value Problems: ordinary and functional boundary value problems, problems involving fractional differential equations, positive and multiple positive solutions of boundary value problems, boundary value problems on the half-line.

- Fixed Point Theorems: degree theory, fixed point index, fixed point theorems in Banach spaces and particularly in cones, applications of fixed point theorems to differential equations.

Analysis of the Research Conducted Until Now

Papers [3,4,6-12] aim at presenting techniques concerning the existence of at least one, in most of the cases positive, solution for boundary value problems. The common ground of these techniques is the use of fixed point theorems and the reformation of the boundary value problem to an equivalent operator, whose fixed points, if any, are solutions of the boundary value problem. A variety of fixed point theorems has been used and the advantages of each case have been outlined. Specifically, it has been demonstrated how to apply the Schauder fixed point theorem, the Krasnoselskii fixed point theorem, the Leggett-Williams fixed point theorem and the Avery-Henderson fixed point theorem to various problems, in such a way that the results obtained provide, easily to the extent possible, verifiable conditions and can address many of the boundary value problems found in literature. In all cases, specific numerical examples are provided to guarantee the applicability of the new results. The boundary value problems studied include second order and first order differential equations, defined in bounded or unbounded intervals of the real line, ordinary and functional differential equations as well as local, nonlocal and terminal conditions. Special attention is paid to positive solutions, even when the fixed point theorem used does not specifically guarantee the existence of such solutions. In certain cases, the existence of multiple solutions is guaranteed, either by using theorems that provide specific conditions for that result, or by repeatedly applying theorems that do not provide such conditions.

Paper [5] presents a modification of the Leggett-Williams fixed point theorem, as well as two applications of this result to boundary value problems. This paper is focused on the fixed point theorem itself, compared to the rest of the papers which are concerned with the way already known fixed point theorems can be applied to guarantee the existence of solutions for boundary value problems. The ideas presented in this paper have been the inspiration for a series of other papers, by authors who are well-known in this research area.

Papers [1,2] study the existence of positive solutions for a variety of boundary value problems, using a fixed point theorem. The techniques presented in these papers do not have to do with the way this fixed point theorem is applied to each problem separately. Contrary to that, the various boundary value problems are dealt with in a uniform way. The main concept of this approach is to deal with a specific differential equation meeting a specific initial condition and use a general boundary condition, involving a not necessarily linear functional. The purpose of the papers is to pose conditions on the functional, which will guarantee that the fixed point theorem can be applied. Apart from the obvious benefit of having one condition covering a wide variety of combinations of problems and fixed point theorems in a uniform way, the existence of such conditions is of great importance, in order to be able to compare the techniques presented in the literature.

Administrative positions

I participated in committees responsible for

- evaluating candidate Visiting Lecturers.
- managing internship positions for undergraduate students.
- advising students regarding academic issues.
- department's website.