

CURRICULUM VITAE

Department of Mathematics, College of Sciences
King Saud University, P. O. Box 2455, Riyadh 11451,

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Personal Data

Name: Mostafa Bachar

Place of birth: Fés, Morocco

Nationality: Austrian

Education

1995 – 1996: DEA (Master II), Applied Mathematics, University of Pau, France.

Supervisor: O. Arino

1996 – 1999: Ph.D., Applied Mathematics, University of Pau, France.

PhD Thesis: **Contribution to delay-differential equations
with impulses: approach by integrated semigroups.**

Supervisor: O. Arino

Career History

2015/16 – current : Associated Professor, King Saud university.

2009/10 – 2014/15: Assistant Professor, King Saud university.

2005/06 – 2008/09: Assistant and Research Associate, University of Graz, Austria.

09/2000 – 01/2005: Research Associate, SFB “Optimization and Control”,
University of Graz, Austria.

1999 – 2000: Teaching and Research Assistant (ATER), University of Pau, France.

1997 – 1999: Instructor (Vacataire), University of Pau, France.

Programming Skills

- Matlab, C/C++, R.

Research Funds

- 05/2009 – 05/2015 : **Body Fluid Dynamics in Hemodialysis Patients – Estimation of Normal Hydration State Using Segmental Bioimpedance Analysis** (Project Number #091-97), within Renal Research Institute, NY. (with Fansan Zhu, PhD).
- 05/2008 – 04/2012 : **Dextrose project** (ClinicalTrials.gov Identifier: NCT00618033) within Renal Research Institute, NY. (with Univ.-Doz. Dr (MD). P. Kotanko and Nathan W. Levin, MD).
- 02/2007 - 02/2010 : **Marie Curie Conferences and Training Courses**, Program Grant MSCF-CT-2006-045961 (with F. Kappel and J. Batzel).
<http://www.uni-graz.at/biomedmath/>

Research Funds Graduate Students (Co-advising with P. Kotanko)

- (1) **Insulin Therapy in Type 1 Diabetes Evaluation by Multiple Regression Analysis**, T. Kitzler, MD-Thesis, Medical University of Graz, April 2005.
- (2) **Functional Examination of transplanted pancreas by mathematical Modelling of intravenous Glucose-Tolerance-testing**, J. Raimann, MD-Thesis, Medical University of Graz, 2007.
- (3) **Mathematical modeling of Glucose Insulin model**, Sumayah Al Hazaa, Master-Project, Department of Mathematics, King Saud University, 2011.
- (4) **Stability Delay Differential Equations with impulses**, Iman Al Gebli, Master-Project, Department of Mathematics, King Saud University, 2011.
- (5) **Oscillation of delay Differential Equations and their applications**, Awatif Al Qahtani, Master-Project, Department of Mathematics, King Saud University, 2012.

Teaching

- (1) 2016 SS and WS: Actuarial Mathematics I and II (Models of life contingencies).
- (2) 2009-now: Integral Calculus; and teaching Linear Algebra and Vector Calculus, differential equations; also Differential Equation and Dynamical System for Master students, in the Department of Mathematics, King Saud University, Riyadh, Saudi Arabia.
- (3) 1997-2000: Calculus I, II Algebra in the Department of Mathematics to first year mathematics students; and also Statistics for Biologist for one semester (SS 2000), to first year mathematics students, University of Pau, France.
- (4) 2001-2008: Optimization and Control in Physiological Systems: Part 1 Techniques of Mathematical Modeling and Analysis, Part 2: Biomedical Applications, to third year mathematics students with final project work group and students presentations. University of Graz, See: (<http://www.uni-graz.at/biomath/courses.html>)
- (5) 2001-2008: Matlab, C and C++ for Engineering and sciences students.

- (6) 2003: Topology, to third year mathematics students, in the Department of Mathematics, University of Graz.
- (7) 2004: PDE's, to third year mathematics students, (I use Matlab for a graphical representation and demonstration); in the Department of Mathematics, University of Graz.
- (8) 2005/06 WS: Partial Differential Equations, to third year mathematics students (I use Matlab for a graphical representation and demonstration); in the Department of Mathematics, University of Graz.
- (9) 2006 SS: Topology, to third year mathematics students, in the Department of Mathematics, University of Graz.
- (10) 2006/07 WS: Linear Algebra, to first year mathematics students, (I use Maple, Mathematica for a graphical representation and demonstration), in the Department of Mathematics, University of Graz.
- (11) 2007 SS, Partial Differential Equations, to third year mathematics students, (I use Matlab for a graphical representation and demonstration); in the Department of Mathematics, University of Graz.
- (12) 2007/08 WS: Topology, to third year mathematics students, in the Department of Mathematics, University of Graz.
- (13) 2007/08 WS: Computing Sciences: Matlab to first year mathematics students; in the Department of Mathematics, University of Graz,
- (14) 2008 SS: Ordinary Differential Equations, to third year mathematics students. (I use Matlab and Maple for a graphical representation and demonstration); in the Department of Mathematics, University of Graz.

Summer Schools and Minisymposium, International Conferences (Organization):

<http://www.uni-graz.at/biomath/workshops.html>

- (1) **Parameter Estimation Techniques for Comprehensive Physiological Models**, Minisymposium accepted at **SIAM Annual Meeting (AN10)**, July 12-16, 2010, David L. Lawrence Convention Center in Pittsburgh, Pennsylvania. (with J. Batzel)
- (2) International Conference on **Mathematical Biology** and Annual Meeting of The Society of Mathematical Biology, University of British Columbia, Vancouver, July 27-39, 2009, organization of minisymposium.
www.math.ubc.ca/Research/MathBio/SMB2009/schedule.php?subsession=MSC4
- (3) **International Conference on Mathematical Biology and Annual Meeting of The Society of Mathematical Biology**, University of British Columbia, Vancouver, July 27-39, 2009, organization of minisymposium.
www.math.ubc.ca/Research/MathBio/SMB2009/schedule.php?subsession=MSC4
- (4) 2008, American Society Nephrology **Renal Week 2008**, November 4-9, Philadelphia, PA. (<http://www.call4abstracts.com/asn/>)
Talk title, “ **Modeling the impact of body mass index on uremic toxin concentrations in hemodialysis patients**”,
(with J. Batzel, N. Levin, F. Kappel, P. Kotanko.)
- (5) European Conference on **Mathematical and Theoretical Biology**, Edinburgh, 29 June - 4 July, 2008, organization of minisymposium.
- (6) **Biomedical Modeling: school and workshop**, Tata Institute, Bangalore, India. February 27 - March 2, 2008. (<http://www.ncbs.res.in/events/BMSW2008.html>)
(with J. Batzel, F. Kappel, S. Nanda, S. Krishna), Supported by Center for Theoretical Sciences, TIFR, Mumbai.
- (7) **Mathematical Modeling of Human Physiological Systems with Biomedical Applications: (BioMedMath)**, 2007-2010, (with J. Batzel and F. Kappel). Supported by A Marie Curie Training Series (EU).
- (8) **Modeling and parameter estimation for cardio-respiratory and metabolic control systems**, on 6th International Congress on Industrial and Applied Mathematics; 16 - 20 July 2007, Zurich Switzerland. (Organization of minisymposium (with J. Batzel))
- (9) **Biomedical Modeling and cardiovascular-respiratory control: Theory and Practice**, July 22 to August 4, 2007, (with J. Batzel and F. Kappel). Supported by A

Marie Curie Training Series (EU) and ESMTB.

- (10) **Modeling and Parameter Estimation for Complex Human Physiological Control Systems**, on SIAM Conference on the Life Sciences, July 31-August 4, 2006, Raleigh, North Carolina, U.S.A. (with M. Olufsen)
Modeling and Sensitivity Analysis for Parameter Estimation of a model of the Human Insulin Glucose System.
Poster Presentation.
- (11) **Mathematical Techniques in Modeling Physiological Systems**, September 10 - 22, 2006, Sarajevo, (with J. Batzel, F. Kappel, A. Muratovic, and M. Avdispahic), Supported by SMB and ESMTB.

Mostafa Bachar

LIST OF PUBLICATIONS

Department of Mathematics, College of Sciences
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e-mail: mbachar@ksu.edu.sa,

Books and Book Chapters

- (1) **Mathematical Modeling and Validation in Physiology: Applications to the Cardiovascular and Respiratory Systems**, Lecture Notes in Mathematics, Vol. 2064, Springer-Verlag, 2013, (with Jerry Batzel and Franz Kappel).
- (2) **Stochastic Biomathematical Models: with Applications to Neuronal Modeling**, Vol. 2058, Springer-Verlag, 2013, (with Jerry Batzel and Susanne Ditlevsen).
- (3) Batzel, Jerry J.; Bachar, Mostafa; Karemaker, John M.; Kappel, Franz. **Merging mathematical and physiological knowledge: dimensions and challenges**, in Mathematical modeling and validation in physiology, 3-19, Lecture Notes in Math., 2064, Springer, Heidelberg, 2013.
- (4) Thomaseth Karl, Batzel Jerry J., Bachar Mostafa, Furlan Raffaello. **Parameter Estimation of a Model for Baroreflex Control of Unstressed Volume**. in Mathematical modeling and validation in physiology, 215-246, Lecture Notes in Math., 2064, Springer, Heidelberg, 2013.
- (5) **Mathematical Modeling of the Cardiovascular System**, (2011), in Mathematical Physiology: Mathematical Modeling, edited by Andrea de Gaetano, CNR IASI Laboratorio di Biomatemica, Roma, in Encyclopedia of Life Support Systems (EOLSS), Developed under the Auspices of the UNESCO, Eolss Publishers, Oxford ,UK, [<http://www.eolss.net>]. (with J. Batzel, F. Kappel).
- (6) **Mathematical Modeling of the Respiratory System**, (2011), in Mathematical Modeling: Mathematical Physiology, edited by Andrea de Gaetano, CNR IASI Laboratorio di Biomatemica, Roma, in Encyclopedia of Life Support Systems (EOLSS), Developed under the Auspices of the UNESCO, Eolss Publishers, Oxford ,UK, [<http://www.eolss.net>]. (with J. Batzel, F. Kappel).
- (7) **Hemodynamics in Humans: physiology and mathematical models**, (2011), in Mathematical Modeling: Mathematical Physiology, edited by Andrea de Gaetano, CNR IASI Laboratorio di Biomatemica, Roma, in Encyclopedia of Life Support Systems (EOLSS), Developed under the Auspices of the UNESCO, Eolss Publishers, Oxford ,UK, [<http://www.eolss.net>]. (with J. Batzel, F. Kappel, V. Bhalani, J. Raimann., P. Kotanko).

Papers

- (1) **On common approximate fixed points of monotone nonexpansive semi-groups in Banach spaces.**, Fixed point theory and applications, **160**, 2015. (with Khamsi, Mohamed A.)

- (2) **Fixed points of monotone mappings and application to integral equations.**, Fixed point theory and applications, **110**, 2015. (with Khamsi, Mohamed A.)
- (3) **On monotone contraction mappings in modular function spaces.**, Fixed point theory and applications, **28**, 2015. (with Alfuraidan, Monther R. and Khamsi, Mohamed A.)
- (4) **On monotone contraction mappings in modular function spaces.**, Fixed point theory and applications, **28**, 2015. (with Alfuraidan, Monther R. and Khamsi, Mohamed A.)
- (5) **A moving asymptotes algorithm using new local convex approximation methods with explicit solutions.**, Electronic Transactions on Numerical Analysis, **43**, 2014. (with Thierry Estebenet and Allal Guessab).
- (6) **Metabolic effects of dialyzate glucose in chronic hemodialysis: results from a prospective, randomized crossover trial.**, Nephrol Dial Transplant, **27**(4), 1559-68, 2012. (with Raimann JG, Kruse A, Thijssen S, Kuntsevich V, Dabel P, Diaz-Buxo JA, Levin NW, Kotanko P.)
- (7) **Modeling the Cardiovascular-respiratory Control System: data, model analysis, and parameter estimation**, Acta Biotheoretica, **58** (4), 2010, (with J. Batzel).
- (8) **Patterns of cardiovascular control during repeated tests of orthostatic loading.** Accepted in Cardiovascular Engineering, **9**(4), 2009, (with J. Batzel, N. Goswami, H. K. Lackner, A. Roessler, F. Kappel, H. Hinghofer-Szalkay).
- (9) **Receding Horizon Controller for the Baroreceptor Loop in a Model for the Cardiovascular System**, Cardiovasc Eng., **8**(1), (2008), 14 – 22 (with M. Mutsaers, J. Batzel, F Kappel, S Volkwein).
- (10) **Evaluation of treatment adherence in type 1 diabetes: a novel approach**, Eur. J. Clin. Invest., **37**, (2007), 207 – 213 (with T. Kitzler, F. Skrabal and P. Kotanko).
- (11) **A class of semigroups regularized in space and time**, Journal of Mathematical Analysis and Applications, **314**, (2006), 558 – 578 (with with W. Desch and Mardiyana).
- (12) **Integrated semigroup associated to a linear delay differential equation with impulses**, Differential and Integral Equations, **17**, (2004), 407 – 442 (with O. Arino).
- (13) **A Trotter-Kato Theorem for α -times integrated C-regularized semigroups**, Functional Differential Equations, **11**, (2004), 103–110 (with W. Desch and Mardiyana).
- (14) **HIV treatment models with time delay**, C. R. Biologies, **327**, (2004), 983–994 (with A. Dorfmayr).
- (15) **Stability of a general linear delay-differential equation with impulses**, Dynamics of Continuous, Discrete and Impulsive Systems, Ser A, **10**(-6), (2003), 973–990 (With O. Arino).

- (16) **Integrated semigroup associated to a linear ordinary differential equation with impulses** (with O. Arino), in Fields Inst Commun., **36**, 17-31, Amer. Math. Soc., Providence, RI, 2003.
- (17) **Existence of periodic solution for a class of delay differential equations with impulses** (with P. Magal), in Fields Inst. Commun., **29**, 37-49, Amer. Math. Soc., Providence, RI, 2001.
- (18) **Stability of systems with fixed impulse moments and an application to cancer chemotherapy**, Differential Equations Dynamic. Systems 7 (1999), no. 1, 49–66 (with V. R. Nosov).

Technical Reports

- (1) **Glucose Exerts a Permissive Effect on Glucagon-Stimulated Insulin Secretion in Healthy Subjects**, DIABETES. **59**, A655-A655, 2010, 70th Annual Meeting of the American-Diabetes-Association Conference Date: JUN 25-29, 2010 Conference Location: Orlando, FL (with Raimann, JG; Rohrer, S et al.)
- (2) **An Algorithm for Determining the Active Slip Systems in Crystal Plasticity Based on the Principle of Maximum Dissipation**. SFB, 2008-020, (with T. Antretter, G. Haase).
- (3) **Linearized Stability for Delay differential equation with impulses: Application to Type 1 Diabetes model**, (with W. Desch), preprint.