Jerry Batzel

Curriculum Vitae

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Nationality: USA

Education

1991 – 1998:	Ph.D., Mathematics, North Carolina State University, Raleigh, North Carolina, USA.
1985 – 1991:	M.S., Mathematics, North Carolina State University, Raleigh, North Carolina, USA.
1981 – 1985:	B.A., New York University New York, USA.

Career History

02/10 – current:	Research Associate, Institute of Physiology, Medical University of Graz
02/09 – current:	Teaching and Research Associate, Institute of Mathematics and Scientific Computing, University of Graz
02/06 – 02/09:	Project leader, FWF grant P18778 Institute for Mathematics and Scientific Computing, University of Graz, Graz, Austria.
01/05 – 02/06:	Research Associate , Institute for Mathematics and Scientific Computing, University of Graz, Graz, Austria.
01/03 – 02/05:	Research Associate, SFB "Optimization and Control" University of Graz, Graz, Austria.
07/02 – 12/02:	Visiting Guest Professor, Institute of Mathematics, University of Graz,Graz, Austria.
07/98 – 06/02:	Research Associate, SFB "Optimization and Control", University of Graz,Graz, Austria.
1997 – 1998:	Mathematics Assistant, Undergraduate Tutorial Center Staff, North Carolina State University, Raleigh, North Carolina, USA.
1992 – 1997:	Graduate Teaching Assistant, Department of Mathematics, North Carolina State University, Raleigh, North Carolina, USA.
1991 – 1992:	Mathematics Lecturer, Department of Mathematics, North Carolina Central University, Durham, North Carolina, USA.
1985 – 1991:	Graduate Teaching Assistant, Department of Mathematics, North Carolina State University, Raleigh, North Carolina, USA.

Awards

1996:	Award for best graduate student section talk at the Southeastern SIAM Conference 96, Clemson, South Carolina

1983, 1984:   Peter Lax Undergraduate Scholarship in Mathematics, New York Univ.

Grants and Appointments

06/12   Land Steiermark Forschungs Grant
                Euro 4000 for Research on inter-abdominal hypertension (IAH).
03/09   Society of Mathematical Biology Annual Meeting
                Special Interdisciplinary Minisymposium Organizer
                $2000 grant for minisymposium speaker travel costs
02/07 – 02/10   Marie Curie Conferences and Training Courses
                Program Grant MSCF-CT-2006-045961
02/06 – 02/09   FWF Grant P18778:
                Modeling the cardiopulmonary-arterial Baroreflexes
07/02 – 12/02   Visiting Researcher, University of Graz

Memberships and Scientific Committees

Graz Univ. Hospital SIDS working group
European Society of Mathematical and Theoretical Biology
Scientific Board: 2008, 2010, and 2012 Conference of the European Study Group on
                  Cardiovascular Oscillations

Publications and lectures

Book publication 1
Book editing 2 (also 1 volume in preparation)
Journal or book chapter publications: 30
Journal publications submitted: 3, in preparation: 2
Refereed proceedings publications: 9
Technical reports, abstracts: 17
Theses: 1
Invited lectures: 22
Other conference lectures: 23
Workshop, minisymposium, conference sessions organized: 26

Research Interests

- Functional Differential Equations: stability analysis for differential equations with delay, delay differential equation applications.
- Medical Applications: modeling of the respiratory and cardiovascular systems in humans, modeling apnea in infants, modeling sleep physiology in humans, hemorrhage and transfusion design.
- Parameter Estimation Problems: parameter identification of the infant human cardiovascular-respiratory systems.
- Optimal Control: optimal control analysis applied to physiological systems.
- Optimization Methods: numerical methods for optimal control systems with and without delay.

Teaching experience

- Studienbefähigungslehrgang (Mathematics I and II), FH Joanneum University of Applied Sciences, Kapfenberg Austria (current).
- Integral und Differentialrechnungen für Umweltsystemwissenschaften, Institute for Mathematics and Scientific Computing, University of Graz (German language) 2012, 2013 (current).
- Vektorrechnen für Umweltsystemwissenschaften, Institute for Mathematics and Scientific Computing, University of Graz (German language) 2013 (current).
- Visiting faculty (Life sciences) International Space University Summer School ISU SSP 11, July 11 -Sept. 9, 2011, Graz Austria.
- Mathematics for Biologists, Institute for Mathematics and Scientific Computing, University of Graz (German language) Fall, 2009, 2010, 2011, 2012.
- Invited lecturer, University of Graz USW interdisciplinary course Spring 2008.
- Linear Algebra, Institute for Mathematics and Scientific Computing, University of Graz (German language) Fall, 2007.
- Co-Principal Organizer: Seminar on Optimization and Control in Physiological Systems: Part 1 Techniques of Mathematical Modeling and Analysis, Part 2: Biomedical Applications. A two semester curriculum course held yearly in the Institute for Mathematics and Scientific Computing, University of Graz 2001-2012 (current).
  See: **www.uni-graz.at/people/batzel/**
- Principal organizer (with D. Schneditz) for a special university course for students and researchers on cardiovascular-respiratory simulation for mathematicians and life scientists in Winter semester 2002 at Karl-Franzens-Universität, Graz, Austria.
  See: **www.uni-graz.at/people/batzel/cvrs_project/home.html**
- College courses taught include senior level Linear Algebra, senior level Computational Mathematics, Engineering Calculus I and II, Pre-calculus Algebra and Trigonometry, Business Calculus and Finite Mathematics.
- Engineering Calculus courses included incorporating into course work the symbolic computation language MAPLE.
- The teaching assistant position at North Carolina State University included complete responsibility for course lectures and grade assignment. Higher level courses at North Carolina State University included responsibility for course material selection.
- The lecturer position at North Carolina Central University included complete responsibility for all aspects of course implementation.

Thesis examination or guidance

- International evaluator: Arho Virkki, PhD thesis at University of Turku, Finland
- External evaluator: Helen Koc, PhD thesis at University of Vienna, Austria
- Master thesis Stefan Fürtinger: second advisor, Institute for Mathematics and Scientific Computing, University of Graz. Austria
- PhD thesis Martin Fink: second advisor, Institute for Mathematics and Scientific Computing, University of Graz. Austria
- PhD thesis Aurelio Del los Reyes: second advisor, Institute for Mathematics and Scientific Computing, University of Graz. Austria

Presentations

(1) International Workshop on Innovative Simulation for Health-Care, September 19-21, 2012 Vienna, Austria, *Modeling Intra-abdominal hypertension.* Invited minisymposium talk.

(2) IEEE-EMBS 2011, Boston, MA., Aug 30 - Sept 3, 2011, *Modeling Cardio-Respiratory System Response to Inhaled CO2 in Patients with Congestive Heart Failure.* Invited minisymposium talk.

(3) ECMTB 2011, Krakow, Poland, June 29 - July 2, 2011, *Methods of Sensitivity Identifiability Analysis in Modeling Human Physiological Systems.*

(4) Workshop: *Experimentation, Data Collection and Modeling approaches for life scientists.* International Space University, Space studies program ISU SSP 11, Graz, Austria, August 2. 2011

(5) Half-day workshop: International Space University, Space studies program, Graz, Austria, July. 29, 2011, *Modeling and Sensitivity Analysis in the Life Sciences,*

(6) BIOSIGNAL 2010: International Biosignal Processing Conference 14 -16 July, Berlin. *Cardiovascular Reactivity during Reaction Tests, Mental Stress and their Combination.* Poster presentation.

(7) Summer School *Mathematical Modeling and Numerical Simulation of the Cardiovascular System*, July 7 âĂŞ July 9, 2010, University of A Coruna, Spain.
Invited teacher lecture.

(8) High School Science Winter School: *Modeling Week in Mathematics (Woche der Modellierung mit Mathematik)*, Pöllau, Austria, February 7 - February 14, 2010, organized by the University of Graz, Austria.
Invited teacher lecture and group leader.

(9) Meeting of the Federation of European Physiological Societies, November 12 âĂŞ November 15, 2009, Ljubljana, Slovenia. *Patterns of Cardiovascular Control in Orthostatic Stress.*
Invited minisymposium presentation.

(10) Computational Challenges in Integrative Biological Modeling, organized by the Mathematical Biosciences Institute, October 5 âĂŞ October 9, 2009, Ohio State University, Columbus, Ohio. *Model Design: evaluating the parameter estimation problem in cardio-respiratory system modeling.*
Invited presentation.

(11) Course on Simulink, automatic differentiation, and Simbiology in the workshop *Training in Use of IT in Mathematical Modeling*, Activity V.1 of the TEMPUS Programme âĂIJSouth East Europe Doctoral Studies in Mathematical SciencesâĂĬ, Projekt No.: 144703-TEMPUS-2008-BA-JPCR, Sept. 7-11, 2009.
Invited minisymposium presentation.

(12) Third Summer School on Mathematics in Biomedical Engineering: Model Validation in Biomedical Engineering and Biophysics, July 19 âĂŞ July 24, 2009 Warwick England. *Parameter estimation for cardio-respiratory and metabolic control models.*
Invited presentation and participation as student project tutor.

(13) American Society of Nephrology (ASN) Renal Week 2008, November 4 âĂŞ November 9, 2008 Philadelphia, PA. *Modeling the Impact of Body Mass Index on Uremic Toxic Concentrations in hemodialysis patients.* Poster presentation.

(14) IAP Trilateral Symposium of Physiology, Graz Austria, September 18-19, 2008. *Modeling the Interaction of the Cardiopulmonary and Arterial Baroreflex.*
Poster presentation.

(15) Summer School on Stochastic Differential Equations with Applications to Physiology, Copenhagen, August 3-16, 2008. *Applications of Methods of Sensitivity Analysis to Estimation of Parameters in Physiological System Models.*
Invited minisymposium lecture.

(16) European Conference on Mathematical and Theoretical Biology Edinburgh, 29th June - 4th July, 2008. *Modeling Short-Term Small Perturbations in Blood Volume and Issues of Cardiovascular Control in Humans.*
Minisymposium lecture.

(17) Fourth International Conference "Inverse Problems: Modeling and Simulation (May 26-31), Fethiye-Turkey, 2008. *A respiratory system model: parameter estimation and sensitivity analysis.*
Contributed lecture.

(18) 5th Conference of the European Study Group on Cardiovascular Oscillations April 7-9, 2008, Parma, Italy.*Time series analysis of variations in hematocrit during hemodialysis.*
Invited lecture.

(19) Tata Institute for Fundamental Research and the International Centre for Theoretical Science, Bangalore, India *Modeling Short-Term Small Perturbations in Blood Volume during Hemodialysis*, March 6, 2008.
Invited lecture.

(20) Course presentation "Respiratory Control System Models" at *International Biomedical Modeling: School and Workshop*, Centre for Applicable Mathematics and the National Center for Biological Sciences, Bangalore India, February 27-March 2, 2008.

(21) Biomedical Engineering Society Annual Fall Meeting 2007, Sept. 28, 2007, Los Angeles *Modeling the Impact of Small Perturbations in Blood Volume on Cardiovascular Control in Humans.*
Contributed lecture.

(22) Biomedical Engineering Society Annual Fall Meeting 2007 pre-conference workshop on "Parameter Estimation Methods in Physiological Modeling", Sept. 26, 2007, Los Angeles *Physiology and Clinical Motivation for Cardiovascular control system modeling.*
Lecture.

(23) Sixth International Conference on Industrial and Applied Mathematics, July 16-20, 2007, Zurich Switzerland
Analyzing Short-term Cardiovascular-Respiratory Control Mechanisms.
Contributing lecture.

(24) Seminar of the Cardiovascular Institute of the Ospedale L Sacco University of Milan April 16th, 2007, Milan Italy
Modeling the Control Response to Blood volume Loss during Hemorrhage.
Invited lecture.

(25) Politecnico Milan Seminar, Department of Bioengineering, April 17th, 2007, Milan Italy *Issues in Modeling Blood Volume Control.*
Invited lecture.

(26) Fourth International Workshop on: "Non-Invasive, Haemodynamic, Autonomic and Vascular Monitoring" October 6-7th, 2006 Graz, Austria,
Modeling Approaches for the Human Cardiovascular-Respiratory Control System for Clinical Applications.
Poster presentation.

(27) SIAM Conference on the Life Sciences, July 31-August 4, 2006, Raleigh, North Carolina, U.S.A,

Modeling and Sensitivity Analysis for Parameter Estimation of a Model of the Human Cardiovascular Control System.
Poster presentation.

(28) IEEE Second Multidisciplinary International Symposium on Positive Systems: Theory and Applications, August 30 - September 1, 2006 Grenoble, France.
Modeling the Human Cardiovascular-Respiratory Control Response to Blood Volume Loss due to Hemorrhage.
Invited minisymposium lecture.

(29) 15th IAA Humans in Space Symposium, May 22-26, 2005, Graz, Austria,
Modeling Blood Volume Control in the Cardiovascular-Respiratory System during Lower Body Negative Pressure Stress.
Invited lecture.

(30) 2004 SIAM Conference on the Life Sciences, July 11-14, 2004, Portland, Oregon,
Aspects of Control of the Cardiovascular-Respiratory System during Orthostatic Stress Induced by Lower Body Negative Pressure.
Invited lecture for minisymposium *"Modeling and Control of Physiological Processes".*.

(31) Workshop on Modeling in Life and Material Sciences and in Technology - March 8 to April 2, 2004, International Center for Theoretical Physics, Trieste, Italy,
Introductory Lectures on Physiology and Cardiovascular Control Modeling.

(32) 7th World Congress on Sleep Apnea, 29 June - 3 July 2003, Helsinki, Finland,
Modeling Delay Dependent Instability in the Control System for Human Respiration.
Invited minisymposium lecture.

(33) Seminar of the Center for Applied Mathematics and Theoretical Physics, University of Maribor, May 20, 2003, Maribor, Slovenia,
Modeling the Human Cardiovascular-Respiratory Control System: an optimal control application to orthostatic stress.
Invited seminar lecture.

(34) Cimpa-Unesco-Morocco Summer School *"Delay Differential Equations and Applications"*, Sept. 9-21, 2002, Marrakech, Morocco,
Modeling the Respiratory Control System: delay dependent stability analysis and applications.
Contributed communication.

(35) 5th European Society of Mathematical and Theoretical Biology tri-annual Conference (ECMTB2002), July 2-6, 2002, Milan Italy,
Modeling Congestive Heart Failure: a control system model with two state delays.
Invited minisymposium lecture.

(36) Group of Nonlinear Dynamics and Synergetics, Faculty of Electrical Engineering, University of Ljubljana, May 29, 2002, Ljubljana, Slovenia,
Modeling the Cardiovascular and Respiratory Control Systems.
Invited two part seminar.

(37) First SIAM/EMS Conference on Applied Mathematics, Sept. 2-6, 2001, Berlin, Germany,
Modeling the Human Cardiovascular-Respiratory Control System with two State Delays: an application to congestive heart failure.
Invited minisymposium lecture.

(38) 2001 SIAM Annual Meeting, July 9-13, 2001, San Diego, California,
Human Respiratory Control System: models, Applications, and Analyses.
Invited minisymposium lecture.

(39) Austrian SIDS Symposium, Karl-Franzens-Universität, July 1, 1999, Graz, Austria,
Modeling and Stability Analysis of the Infant Human Respiratory Control System.
Invited lecture.

(40) University Klinik für Kinder und Jugendheilkunde SIDS Group, Karl-Franzens-Universität,
February 10, 1999, Graz, Austria,
Aspects of Modeling the Infant Respiratory System.
Invited lecture.

(41) Mathematics/Physiology Seminar, Karl-Franzens-Universität, December 10, 1998, Graz,
Austria,
Stability Analysis and Delay in the Human Respiratory Control System.
Contributed lecture.

(42) Institute für Mathematik und wissenschaftliches Rechnen, Karl-Franzens-Universität,
November 16, 1998 , Graz, Austria,
A Global Model of the Human Cardiovascular and Respiratory System.
Contributed lecture.

(43) 21st SIAM-SEAS Conference 97, April 4-5, 1997, Raleigh, North Carolina,
*Modeling Instability in the Control System for Human Respiration: applications to infant
non-rem sleep.*
Contributed lecture.

(44) Third Mississippi State Conference on Differential Equations and Computational Simu-
lations; May 16-17, 1997, Mississippi State Univ., Starkville, Miss.,
*A Mathematical Model of the Human respiratory Control System with State Dependent
Delay.*
Contributed lecture.

(45) Southeastern SIAM Conference 96; March 28-29. 1996, Clemson, SC,
Medical Applications of Modeling the Human Respiratory Control System.
Contributed lecture.

Other Conferences Attended

(1) 9th Meeting of the European Federation of Autonomic Societies (EFAS) 2007 and 2nd
Joint Meeting with the American Autonomic Society (AAS) Vienna, Austria, October
10 -13, 2007.

(2) EnuMath Conference on Numerical Methods, Graz, Austria, September 10-14, 2007.

(3) Workshop on *Short-term Cardiovascular-Respiratory Control Mechanisms*, The American
Institute of Mathematics, Palo Alto Calif., October 9 to October 13, 2006.

(4) *Integrative Physiology and Interdisciplinarity*, 10th International IAP Colloquium, Graz
Austria, June 2, 2006.

(5) *Advances in Numerical Algorithms* Graz, Austria, September 10-13, 2003.

(6) European Respiratory Society 13th Annual Congress, Vienna, Austria, September 27 to
October 1, 2003.

(7) *Advances in Numerical Algorithms* Graz, Austria, September 10-13, 2003.

(8) *Delay Differential and Difference Equations with Applications*, Veszprem, Hungary, Au-
gust 25-29, 2003.

(9) Third International Workshop on *The Human Circulation: Non-Invasive Haemodynamic,
Autonomic and Vascular Monitoring*, Graz Austria, May 9-11, 2003.

(10) Fifth International Summer School-Conference *Let's Face Chaos through Nonlinear Dy-
namics*, Center for Applied Mathematics and Theoretical Physics, University of Maribor,
Maribor, Slovenia, June 30-Jul 14 2002.

(11) Workshop on *Proper Orthogonal Decomposition and its Application*. Graz, Austria, May 25-27, 2000.

(12) Pädiatrische Schlafmedizin Conference, February 24-26, 2000, Vienna, Austria.

Workshop, Minisymposium, Summer School and Seminar Organization

(1) Track organizer *Patient Specific Modeling of the Cardiovascular-Respiratory system: interdisciplinary approaches to theory and practice* (with M.S. Olufsen and N. Goswami) The International Workshop on Innovative Simulation for Healthcare September 25-27, 2012, Athens, Greece.

(2) Member international program committee *International Workshop on Innovative Simulation for Healthcare* September 19-21, 2012, Vienna, Austria.

(3) Track organizer *Patient Specific Modeling of the Cardiovascular-Respiratory system: interdisciplinary approaches to theory and practice* (with M.S. Olufsen and N. Goswami) The International Workshop on Innovative Simulation for Healthcare September 19-21, 2012, Vienna, Austria.

(4) Workshop (half day): *Mathematical Modeling in the life sciences* International Space University, Space studies program ISU SSP 11, Graz, Austria, July. 29, 2011 (organizer/lecturer).

(5) Workshop: *Experimentation, Data Collection and Modeling approaches for life scientists* International Space University, Space studies program ISU SSP 11, Graz, Austria, August 2. 2011 (organizer/lecturer).

(6) Contribution Session: *Modeling physiological systems: model validation and experimental design issues* ECMTB Conference June. 29 to July 2, 2011 (co-organizer). Accepted.

(7) Minisymposium: *Parameter Estimation Techniques for Comprehensive Physiological Models* SIAM 2010 Conference on the Life Sciences July. 12-15, 2010 (co-organizer).

(8) Workshop: *Training in Use of IT in Mathematical modeling* Activity V.1 of the TEMPUS Programme âĂIJSEE Doctoral Studies in Mathematical SciencesâĂİ, Projekt No.: 144703-TEMPUS-2008-BA-JPCR, Sept. 7-11, 2009 (organizer committee member).

(9) Society of Mathematical Biology Meeting, Vancouver, July 26 to July 30, 2009 *The Cardiovascular and Respiratory Systems: experimental and modeling studies of interactions with clinical significance*, Special experimental interdisciplinary double minisymposium (SIM) (with Z. Topor and M. Bachar).

(10) Istanbul Conference 2009 *Mathematical Methods and Modeling in the Life Sciences and Biology and Medicine*(ICMMM-LSBM), 17-21 August, 2009, Sile, Istanbul, Turkey (Member of international organizing committee).

(11) Double Minisymposium *Modeling and Parameter Estimation for the Cardiovascular and Respiratory Systems*, European Conference on Mathematical and Theoretical Biology Edinburgh, 29 th June - 4th July, 2008.

(12) *Biomedical Modeling: School and Workshop*, a joint event organized with the Centre for Applicable Mathematics, Bangalore India, and the Center for Theoretical Sciences, Mumbai India, February 27-March 2, 2008 (with M. Bachar and F. Kappel, and S. Nanda).

(13) Biomedical Engineering Society Annual Fall Meeting 2007: one day pre-conference workshop *Parameter Estimation Methods in Physiological Modeling*, Los Angeles, Sept. 26, 2007 (organizer with H.T. Tran and F. Kappel).

(14) Contribution session *Short-Term Cardio-Respiratory Regulation: Mathematical Modeling and Clinical Applications*, Biomedical Engineering Society Annual Fall Meeting 2007, Los

Angeles, Sept. 28, 2007
organizer (with H.T. Tran).

(15) Marie Curie 4 school/workshop series 2007-2010: Mathematical Modeling of Human Physiological Systems with Biomedical Applications,
http://www.uni-graz.at/mc_training_schools/info.html ,
(organizers with M. Bachar and F. Kappel).

(16) Graz Summer School/Workshop: Biomedical Modeling and Cardio-Respiratory Control: Theory and Practice, July 22 to August 4, 2007,
www.uni-graz.at/mc_training_schools/graz/index.html,
(organizers with M. Bachar and F. Kappel).

(17) Double Minisymposium: *Modeling and Parameter Estimation for the Cardiovascular Respiratory and Metabolic Control Systems*, ICIAM 07, Zurich Switzerland, July 16 -20, 2007 (with M. Bachar).

(18) Workshop *Short-term Cardiovascular-Respiratory Control Mechanisms*
sponsored by the American Institute of Mathematics, Palo Alto Calif., October 9-13,2006. (organizers with M. Olufsen, H. T. Tran, V. Novak, and F. Kappel).

(19) Summer School: Mathematical Techniques in Modeling Physiological Systems, organized jointly by the Mathematics and Medical Physiology Group of the Institute for Mathematics and Scientific Computing, Karl-Franzens-Universität and the Faculty of Natural Sciences and Mathematics, University of Sarajevo. Sept. 10 - 24, 2006, Sarajevo, Bosnia Herzegovina,
www.uni-graz.at/biomath/Sarajevo-06/index.html,
Primary organizer (with M. Bachar, F. Kappel, A. Muratovic, and M. Avdispahic).

(20) Summer School: Control Theory with Application to Physiology and Medicine, organized by the Mathematics and Medical Physiology Group of the Institute for Mathematics and Scientific Computing, Karl-Franzens-Universität, July 24 - Aug. 5, 2005, Graz, Austria,
www.uni-graz.at/biomath/summer_school,
Primary organizer (with M. Bachar).

(21) Group student research project *Modeling the Response to Hemorrhage in the Cardiovascular System* for the educational workshop *Workshop on Modeling in Life and Material Sciences and in Technology*, held at the International Center for Theoretical Physics, Trieste, Italy, March 8 to April 2, 2004. Principal project organizer with F. Kappel.

(22) Principal organizer for a seminar lecture series on optimization and control for mathematicians and life scientists in Winter-Summer Semesters 2001-2013 at Karl-Franzens-Universität, Graz, Austria. See for example:
www.uni-graz.at/people/batzel/ws03_seminar/home.html.
www.uni-graz.at/people/batzel/ws04_seminar/index.html.
www.uni-graz.at/people/batzel/ws_05_seminar/index.html.
www.uni-graz.at/people/batzel/ws_09-10/index.html.

(23) Workshop on Cardiovascular Respiratory and Metabolic Control Modeling, SFB "Optimization and Control", Karl-Franzens-Universität, June 11-14, 2003, Graz, Austria,
www.uni-graz.at/people/batzel/Workshop_2003/,
Primary organizer (with D. Schneditz).

(24) Graz 2003 culture capital event **UNIversum** node designed to introduce visitors to research in physiological modeling using mathematics. Held at IAP institute in cooperation with the Research Center on Optimization and Control, Karl-Franzens-Universität, May 15-17, 2003, Graz, Austria,

www.uni-graz.at/forschung/aktuell/presse_meldungen/graz2003.html,
Primary organizer (with F. Kappel and Martin Fink).

(25) Minisymposium on *Cardiovascular and Respiratory Modeling* First SIAM/EMS Conference on Applied Mathematics, Sept. 2-6, 2001, Berlin, Germany.
Primary organizer (with F. Kappel).

(26) Workshop on Cardiovascular-Respiratory Modeling, SFB "Optimization and Control", Karl-Franzens-Universität, June 14-16, 2001, Graz, Austria,
www.uni-graz.at/people/batzel/WORKSHOP_2001/,
Primary organizer (with D. Schneditz).

Journal Editor and Reviewer Activity

- Guest Editor Springer Lecture Notes in Mathematics Biosciences *volumes I - III of Marie Curie Program Biomedmath 2007-2010* volume I, II completed, III in preparation.
- Guest Editor *Cardiovascular Engineering* (with M. Olufsen, F. Kappel, V. Novak, H. T. Tran), Cardiovascular Engineering Special Issues, 8(1) and 8(2), 2008.
- Guest Editor *Cardiovascular Engineering* (with D. Schneditz, F. Kappel, T. Kenner), Cardiovascular Engineering Special Issues, 4(1) and 4(2):pp 1-218, 2004.
- Guest Editor *Abstracts from the Workshop on Cardiovascular, Respiratory and Metabolic Control Modeling*, published in *Cardiovascular Engineering*, June 2003, Volume 3, Issue 2 (with D. Schneditz).
- Editor *Proceedings of the SFB Workshop on Cardiovascular-Respiratory Control Modeling Uni-Graz June 14-16 2001 (with D. Schneditz)*.
- Journal Reviewer for *American Journal of Physiology (Regulatory, Integrative and Comparative Physiology), American Journal of Physiology (Heart, Circulatory Physiology), Biorheology, Bulletin of Mathematical Biology, Computer Methods and Programs in Biomedicine, Computational and Mathematical Methods in Medicine, Engineering in Medicine and Biology Society. IEEE EMBS Proceedings 2011, IEEE EMBS Proceedings 2012, IEEE Transactions on Circuits and Systems, IEEE Transactions on Biomedical Engineering, Journal of Applied Physiology, Journal of Mathematical Biology, Journal of Theoretical Biology, Journal of the American Society for Artificial Internal Organs, Mathematical Biosciences, Mathematical Biosciences and Engineering, Plos One, Springer Publishing (book review), Systems Biology and Medicine, The Philosophical Transactions of the Royal Society A*.
- Grant proposal Review for United States National Institute of Health (NIH).
- Grant proposal Reviewer for the National Foundation for Science, Higher Education and Technological Development of the Republic of Croatia.

Publications

Books

(1) *Stochastic Biomathematical Models with Applications to Neuronal Modeling.* Springer Lecture Notes in Mathematics Biosciences (LNMBIOS) Volume 1 of 4 volumes planned from the Marie Curie 4 school/workshop series 2007-2010: Mathematical Modeling of Human Physiological Systems with Biomedical Applications. Volume editors M. Bachar, J. J. Batzel, and S. Dittlevsen, Springer, Heidelberg, 2012.
http://www.springer.com/series/6981

(2) *Mathematical Modeling and Validation in Physiology: Applications to the Cardiovascular and Respiratory Systems.* Lecture Notes in Mathematics Springer lecture Notes in

Mathematics Biosciences (LNMBIOS) Volume 2 of 4 volumes planned from the Marie Curie 4 school/workshop series 2007-2010: Mathematical Modeling of Human Physiological Systems with Biomedical Applications. Series and first volume editors J. J. Batzel , M. Bachar, and F. Kappel, Springer Verlag, Heidelberg, 2013.

(3) *Cardiovascular and Respiratory Systems: Modeling, Control and Analysis* (with F. Kappel, H. T. Tran, and D. Schneditz), SIAM Frontiers in Applied Mathematics, SIAM Press, December 2006.

(4) *Modeling Cancer and Cancer Treatment.* Lecture Notes in Mathematics (LNMBIOS) Volume 3 of 4 volumes planned from the Marie Curie 4 school/workshop series 2007-2010: Mathematical Modeling of Human Physiological Systems with Biomedical Applications. volume editor with M. Chaplain and M. Bachar. In preparation.

Papers and Book Chapters

(1) *Time series analysis of hematocrit during blood volume sequestration perturbations* (J. J. Batzel, H. Lackner, D. Schneditz). In preparation.

(2) *Applications of phase synchronization and surrogate data analysis in analyzing experimental data in physiology and psychology* (H. Lackner, J, J, Batzel). In preparation.

(3) *Case study of confounding factors in interpreting hemodynamic responses to mental stress* (H. Lackner, H. Hinghofer-Szalkay, J. J. Batzel, I. Papousek). Submitted.

(4) *Sensitivity identifiability of a baroreflex control model for the cardiovascular system* (J. J. Batzel, M. Fink, S. Fürtenger, M. Bachar, F. Kappel). Submitted.

(5) *Analyzing Models for Estimation of Pulse Pressure* (M. Fink, J. J. Batzel, S. Fürtenger). Submitted.

(6) *Space physiology IV: mathematical modeling of the cardiovascular system in space exploration* (K. M. Sharp, J.J. Batzel, J. P. Montani) Eur J Appl Physiol. 2013 Mar 29. [Epub ahead of print].

(7) *Maximizing information from space data resources: a case for expanding integration across research disciplines* (N. Goswami, J. J. Batzel, G. ClÃľment, et al.). Eur. J. Appl. Physiol. Eur J Appl Physiol. 2012 Oct 17. [Epub ahead of print].

(8) *Parameter estimation of a model for baroreflex control of unstressed volume* (K. Thomaseth, J. J. Batzel, M. Bachar, R. Furlan). Book chapter in Batzel J. J., Bachar M., and Kappel F. editors *Mathematical Modeling and Validation in Physiology: applications to the cardiovascular and respiratory systems*, Springer Lecture Notes in Mathematics Biosciences Series,. Springer Verlag, Heidelberg 2013.

(9) *Merging mathematical and physiological knowledge: dimensions and challenges* (J. J. Batzel, M. Bachar, J. M. Karemaker, F. Kappel). Book chapter in Batzel J. J., Bachar M., and Kappel F. editors *Mathematical Modeling and Validation in Physiology: applications to the cardiovascular and respiratory systems*, Springer Lecture Notes in Mathematics Biosciences Series, Springer Verlag, Heidelberg 2013.

(10) *Application of the Unscented Kalman filtering to parameter estimation* (A. Attarian, J. J. Batzel, B. Matzuka, and H. T. Tran). Book chapter in Batzel J. J., Bachar M., and Kappel F. editors *Mathematical Modeling and Validation in Physiology: applications to the cardiovascular and respiratory systems*. Springer Lecture Notes in Mathematics Biosciences Series, Springer Verlag, Heidelberg, 2013.

(11) *Patient specific modeling of cardiovascular and respiratory dynamics during hypercapnia* (L. M. Ellwein, S. R. Pope, A. Xie, J. J. Batzel, C. T. Kelley. M. S. Olufsen). Math Biosci. 241(1):56-74, 2013.

(12) *Heart rate reproducibility assessed by surrogate data analysis,* (N. Goswami, A. Roessler, H. Lackner, J.- J. Batzel, H. Hinghofer-Szalkay). Annales Kinesiologiae 3(1): 35-46, 2012,

(13) *Bridging different perspectives of the physiological and mathematical Disciplines* (J. J. Batzel, H. Hinghofer-Szalkay, F. Kappel, D. Schneditz, T. Kenner, N. Goswami). Adv Physiol Educ. 36(4):265-74, 2012.

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