

M.Sc. Daniel Georgiev, PhD

PERSONAL INFORMATION

UL 507, Univerzitni 8
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Czech Republic
Date of birth: 07.02.1980

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INTRODUCTION

Dr. Georgiev is an expert in systems and control with application interests in synthetic biology. He has developed several methods for system optimization and experimental design. His articles have received over 80 citations.

RESEARCH EXPERIENCE

University of West Bohemia in Pilsen, Pilsen, CZ

9.2010 – present

JOB TITLE: Assistant professor

RESPONSIBILITIES: Primary investigator of the cell cybernetics lab (CECYL).

University of Washington, Seattle, WA USA

2007 – 2009

JOB TITLE: Postdoctoral Scholar

RESEARCH FOCUS: Utilization of analytical methods for the synthesis and characterization of biochemical systems such as E. coli and in vitro genetic networks.

CONTRIBUTIONS: Developed a novel identification process based on the scientific method. Developed algorithms for automatic experimental design for discovery in DNA computing networks with the goal of increasing system robustness.

University of Washington, Seattle, WA USA

2007 – 2009

JOB TITLE: Postdoctoral Scholar

RESEARCH FOCUS: Mathematical modeling of physiological control systems with focus on the effects of chronic exposure to inhalants on mammalian physiology.

CONTRIBUTIONS: Mathematical modeling of physiological dysregulation resulting in mammalian acute tolerance and chronic dependence. Experimental design for identification of neural networks.

University of Michigan, Ann Arbor, MI USA

2002 – 2007

JOB TITLE: Research Assistant

RESEARCH FOCUS: Design and optimization of distributed computing systems and networked control systems.

CONTRIBUTIONS: Decomposed optimal decision making into decoupled modules without loss of performance, increased performance using lower bandwidth.

ADVISORS: Prof. Dawn M. Tilbury and Prof. Pierre T. Kabamba.

University of New Mexico, Albuquerque, NM USA

2000 – 2002

JOB TITLE: Research Assistant

RESEARCH FOCUS: Cylinder and cavity flows.

CONTRIBUTIONS: Developed 2-D flow experimental tools.

ADVISOR: Prof. Peter Vorobieff.

University of New Mexico, Albuquerque, NM USA

2000 – 2002

JOB TITLE: Research Assistant

RESEARCH FOCUS: Stability study of Microwave-Powered Sails (with NASA JPL).

CONTRIBUTIONS: Developed a MATLAB based simulation software.

ADVISORS: Prof. Chaouki Abdallah and Prof. Edl Schamiloglu

SPECIALIZED
COURSES

Cold Spring Harbor Laboratory, Cold Spring Harbor, NY USA **7.2012 – 8.2012**

COURSE ON YEAST GENETICS AND GENOMICS – A modern, state of the art laboratory course designed to teach the students the full repertoire of genetic approaches needed to dissect complex problems in the yeast *Saccharomyces cerevisiae*.

University of Freiburg, Freiburg, Germany

3.2012

BIOSS PRACTICAL COURSE 2012 SYNTHETIC BIOLOGY AND SIGNALING – A laboratory course on advanced synthesis methods and theory with focus on mammalian systems.

Los Alamos National Laboratory, Los Alamos, NM USA

7.2011 – 8.2011

THE SIXTH Q-BIO SUMMER SCHOOL – Practical course in advanced predictive modeling of cellular regulatory systems providing in depth instruction of modeling techniques from specific areas of quantitative biology.

EDUCATION

University of Michigan, Ann Arbor, MI USA

9.2002 – 6.2007

Ph.D., Mechanical Engineering (GPA - 8.12/9.00), June 2007

DISSERTATION TITLE: “Synergy in Teams with Incomplete Information”

ADVISORS: Prof. Dawn M. Tilbury and Prof. Pierre T. Kabamba

M.S., Mathematics (GPA - 8.13/9.00), December 2005

M.S., Mechanical Engineering (8.13/9.00), December 2005

University of New Mexico, Albuquerque, New Mexico USA

9.1998 – 5.2002

B.S., Mechanical Engineering (GPA - 4.14/4.00), May 2002

INDUSTRIAL
EXPERIENCE

Nanda Home Inc., Rochester Hills, MI USA

2009 – 2010

JOB TITLE: CTO

COMPANY PROFILE: We humanise products people use everyday.

TASKS: Management and execution of various commercialization and development projects, e.g., novel touch interface, mechanical and structural design, custom display segmentation, innovative packaging, interactive point-of-purchase display, social media based marketing, and web design.

Honeywell Laboratories, Minneapolis, MN USA

2006 – 2006

JOB TITLE: Research Intern

GROUP PROFILE: Navigation and control division focused on navigation without GPS availability.

TASKS: Design (programming and theory) and implementation of software for motion estimation using a stereo image sequence.

TEACHING
EXPERIENCE

University of West Bohemia, Pilsen, CZ **9.2011 – present**

Instructor of Introduction to Cellular System Modeling and Modeling and Simulation 2

RESPONSIBILITIES: Material, assignments, grading.

MATERIAL COVERED: Biological principles from the engineering perspective, modeling of chemical reaction networks, transcription network motifs, robustness in signaling pathways, metabolic pathway control.

University of Michigan, Ann Arbor, MI USA **9.2005 – 12.2006**

Graduate student instructor of ME 461, Automatic Control (Fall 2005 and 2006)

RESPONSIBILITIES: Taught discussion section and selected lectures.

MATERIAL COVERED: Frequency and time domain modeling, control design in frequency domain, control design in time domain, discrete event systems.

Graduate Student Instructor Mentor (Winter and Fall 2006)

RESPONSIBILITIES: Consult and mentor graduate student instructors in the College of Engineering. Facilitate workshops on teaching strategies and training of graduate student instructors.

University of New Mexico, Albuquerque, NM USA **9.1998 – 5.2000**

Tutor

RESPONSIBILITIES: Tutor students in a high school outreach program focused on minorities.

MATERIAL COVERED: Elementary mathematics, chemistry, biology, physics.

HONORS AND
AWARDS

Best presentation in session at the American Contr. Conf. – years 2004, 2006, 2007

ASEE Outstanding Student Instructor Awards – Honorable Mention 2005

NSF Graduate Research Fellowship – active years of 2002 to 2005

George Breece Prize (highest GPA Univ. of NM, School of Eng.) – 2002

Mechanical Engineering Outstanding Junior Award (Univ. of NM) – 2001

Presidential Scholar (Univ. of NM scholarship) – active years of 1998 to 2002

SERVICE AND
MEMBERSHIP

Graduate Student Forum Mechanical Engineering

Department Representative – 2004

Member of Tau Beta Pi, Pi Tau Sigma, AIAA, IEEE, ASME

PUBLICATIONS

Refereed Journal Papers

E. Janeček and D. Georgiev, “Probabilistic extension of the backward/forward load flow analysis method,” submitted to *IEEE Transactions on Power Systems*, December 2010.

D. Georgiev, P. T. Kabamba, and D. M. Tilbury, “A new model for team optimization: The effect of uncertainty on interaction,” *IEEE Transactions on Systems, Man, and Cybernetics:*

A, September 2007.

D. Georgiev and D. Tilbury, "Packet-Based Control: The H_2 - optimal solution," *Automatica*, Vol. 42, No. 1, pp. 137-144, January 2006.

D. Georgiev and P. Vorobieff, "The slowest soap-film tunnel in the Southwest," *Review of Scientific Instruments*, Vol. 73, No. 3, pp. 1177-1184, March 2002.

P. Vorobieff, D. Georgiev, and M.S. Ingber, "Onset of the second wake in two dimensions: Dependence on the Reynolds number," *Physics of Fluids*, Vol. 14, No. 7, pp. L53-L56, July 2002.

Refereed Conference Papers

P. Zach, A. Vignoni, D. Georgiev, and J. Picó, "Alternativas de biología sintética para el control de rutas metabólicas", *Jornadas de Automatica*, Valencia, Spain, September 3-5, 2014.

D. Georgiev, E. Janeček, and P. Voráč, "Computing Intervals of Secure Power Injection", *IFAC World Congress*, Cape Town, South Africa, August 24-29, 2014.

P. Voráč, E. Janeček, and D. Georgiev, "Interval Based Network Operation Respecting N-1 Security Criterion", *ISGT*, Istanbul, Turkey, October 12-15, 2014.

D. Georgiev, L. Houdová, M. Fetter, and P. Jindra, "A scalable method for efficient stem cell donor HLA genotype match determination", *The 2014 International Conference on Biology and Biomedicine*, Prague, Czech Republic, April 2-4, 2014.

P. Voráč and D. Georgiev, "Effects of loss models on locational reserve policies in uncertain power systems", *52nd IEEE Conference on Decision and Control*, Florence, Italy, December 10-13, 2013.

D. Georgiev and E. Janeček, "Risk Limiting Dispatch With Optimal Curtailing in Active Distribution Networks," paper submitted to the *European Control Conf.*, Zurich 2013.

P. Voráč and D. Georgiev, "Effects of loss models on locational reserve policies in uncertain power systems," paper submitted to the *European Control Conf.*, Zurich 2013.

D. Georgiev and E. Janeček, "Penalizing Source Uncertainty in Wholesale Electricity Markets," accepted to the *Environment and Electrical Energy Conf.*, May 2011.

D. Georgiev, M. Fazel, and E. Klavins, "Model Discrimination of Chemical Reaction Networks by Linearization", *American Control Conference*, Baltimore, MD, June 2010.

D. Georgiev and E. Klavins, "Model Discrimination of Polynomial Systems via Stochastic Inputs", presented at the *IEEE Conf. on Decision and Contr.*, Cancun, Mexico, December 2008.

D. Georgiev, P. T. Kabamba, and D. M. Tilbury, "Synergy brittleness in decentralized minimax decision problems", presented at the *IEEE Conf. on Decision and Contr.*, New Orleans, LA, December 2007.

D. Georgiev, P. T. Kabamba, and D. M. Tilbury, "Brittle Synergy: An optimal decomposition of minimax team decision problems", *Proc. American Contr. Conf.*, New York City, NY, June 2007.

D. Georgiev, P. T. Kabamba, and D. M. Tilbury, "On the relationship between decision uncertainty and interaction level: A new model for team optimization," *Proc. American*

Contr. Conf., Minneapolis, MN, June 2006.

D. Georgiev and D. Tilbury, "Packet-Based Control," *Proc. American Contr. Conf.*, Boston, MA, June 2004.

E. Schamiloglu, C.T. Abdallah, D. Georgiev, J. Benford, and G. Benford, "Control of Microwave-Propelled Sails Using Delayed Measurements", *Proc. Space Technology and Applications International Forum (STAIF-2002)*, *Space Exploration Technology Conf.*, AIP Conf. Proc. 608, 2002.

P. Vorobieff, D. Georgiev, and T. Shakeel, "Bluff-body wake evolution and interaction in two dimensions," *Proc. of the 4th International Conference on Advances in Fluid Mechanics*, Ghent, Belgium, May 2002.

E. Schamiloglu, C. T. Abdallah, K. A. Miller, D. Georgiev, J. Benford, G. Benford, and G. Singh, "3-D Simulations of Rigid Microwave Propelled Sails Including Spin," *Proc. Space Technology and Applications International Forum (STAIF-2001)*, *Space Exploration Technology Conf.*, AIP Conf. Proc. 552, 2001.

Papers Presented

P. Zach, H. Kasl, V. Babuška, and D. Georgiev, "Systematic promoter tuning in negative autoregulatory transcription networks", *The Sixth International Meeting on Synthetic Biology Conference (SB6.0)*, July 9 - 11, 2013, Imperial College, London, UK.

T. Puchrová, M. Leba, V. Babuška, and D. Georgiev, "Modeling the Bacterial Min System", *The Sixth International Meeting on Synthetic Biology Conference (SB6.0)*, July 9 - 11, 2013, Imperial College, London, UK.

P. Fikar, V. Georgiev, V. Babuška, and D. Georgiev, "Dependence of dielectrophoretic forces on membrane proteins", *The Sixth International Meeting on Synthetic Biology Conference (SB6.0)*, July 9 - 11, 2013, Imperial College, London, UK.

D. Georgiev and P. Zach, "Systematic tuning of a negative autoregulatory transcription network", poster presented at the first *Applied Synthetic Biology in Europe Meeting*, Barcelona, Spain 2012.

D. Georgiev, "Synthesis of identifiable chemical reaction networks", submitted to the *5th annual q-bio Conference on Cellular Information Processing*, Santa Fe, New Mexico, 2011.

D. Georgiev, "Automatizovaný návrh dynamických diagnostik", presented at *MedTech*, Pilsen, Czech Republic, 2010.

D. Georgiev, J. Bishop, and E. Klavins, "Experimental Design of In Vitro DNA Reaction Networks", presented at the *2nd annual q-bio Conference on Cellular Information Processing*, Santa Fe, New Mexico, 2008.

D. Georgiev, P. T. Kabamba, and D. M. Tilbury, "Distributed risk minimization in teams with incomplete information", presented at the *Risk Symposium 2007: Risk Analysis for Homeland Security and Defense Theory and Application*, Santa Fe, NM, March 2007.

P. Vorobieff, D. Georgiev, and T. Shakeel, "Laser visualization of interacting 2D wakes," poster presented at the annual meeting of the *Division of Fluid Dynamics*, American Physical Society, San Diego, CA, November 2001.

D. Georgiev and P. Vorobieff, "Power-law behavior of the onset of a 2D second wake," presented at the annual meeting of the *Division of Fluid Dynamics*, American Physical

Society, San Diego, CA, November 2001.

P. Vorobieff, D. Georgiev, M. Ingber, E. Rericha, and R.E. Ecke, "An experimental and numerical study of cylinder wakes," presented at the annual meeting of the *Division of Fluid Dynamics, American Physical Society*, Washington, DC, November 2000.

P. Vorobieff and D. Georgiev, "Driven cavity soap-film flow," poster presented at the annual meeting of the *Division of Fluid Dynamics, American Physical Society*, Washington, DC, November 2000.

D. Georgiev and P. Vorobieff, "Air drag and viscous dissipation in a tilted soap-film tunnel," presented at the annual meeting of the *Division of Fluid Dynamics, American Physical Society*, Washington DC, November 2000.