

Name and surname: **Bratislav Svetožarević**

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## FIELDS OF INTEREST

**Dynamic Systems:** Theory, Modeling, Simulation, Control, Estimation, and Fault Detection and Isolation and their application to real-world problems

**Robotics:** Bio-inspired, Humanoid, Compliant and Antagonistic Actuation

**Computation:** Optimization Theory and Practice; Soft Computing; Decision Support Tools

**Embedded Systems:** Hardware and Software Design, Real-Time Control. Graphical User Interface Software, Sensors and Actuators Design, Signal Processing

**Power Systems:** Wind Turbines

**Applications:** Robotics, Building Systems, Process Control

## EDUCATION

- 2014 – pres. **PhD candidate**, Swiss Federal Institute of Technology (ETH) Zurich, Switzerland, Chair of Architecture and Building Systems, Institute of Technology in Architecture, Department of Architecture.  
*Focus:* Soft Robotic Actuators for Adaptive Solar Facade; Adaptive, Occupant-Centred Control of Building Systems  
*Supervisor:* Prof. Arno Schlüter
- 2008 – 2010 **Master of Science in Electrical Engineering and Computer Science**, University of Belgrade, Serbia, Signals and Systems Department, Faculty of Electrical Engineering; GPA 10 of 10.  
*Focus:* Robotics, Advanced Control Theory (Multivariable, Robust), Soft Computing (Neural Networks, Fuzzy Logics, Genetic Algorithms).  
*Thesis Title:* “Control of non-compliant and compliant antagonistic drives in robotic systems”.  
*Supervisor:* Prof. Veljko Potkonjak
- 2004 – 2008 **Dipl. -Ing. in Electrical Engineering** (4 years program), University of Belgrade, Serbia, Signals and Systems Department, Faculty of Electrical Engineering; GPA 9.78 of 10 (the best graduated student of the department).  
*Focus:* Dynamic Systems Theory, Modeling, Simulation, Control, Estimation; Signal Processing; Embedded Systems.  
*Thesis Title:* “Modelling and control of nonlinear, multivariable magnetic levitation system”.  
*Supervisor:* Prof. Trajko Petrovic
- 2000 – 2004 **Mathematical Gymnasium, Belgrade, Serbia** – a special school with the high national distinction status for gifted and talented students of mathematics, physics and informatics; GPA 5 of 5.

## RESEARCH EXPERIENCE

- 09/2010 – 09/2012     **Research assistant, Institute of Automatic Control, Swiss Federal Institute of Technology (ETH) Zurich, Switzerland**  
*Supervisor:* Prof. John Lygeros  
*Project:* Fault Detection and Isolation for Wind Turbines  
*Outlook:* Modeling of pitch and blade regulated, horizontal axis, variable speed wind turbine, modeling of fault signals, and design of optimization based fault detection and isolation filters to minimize the contribution of measurement noise in residuals.  
*Project:* Decision Support Tools for Optimal Generation Capacity Expansion in Liberalized Electricity Markets  
*Outlook:* Modeling of techno-economical aspects of the power system with renewable generation and development of decision support tools as optimization problems (single- and bi-level; multistage stochastic)
- 02/2009 – 06/2010     **Research assistant, Department of Signals and Systems, Faculty of Electrical Engineering, University of Belgrade, Serbia**  
*Supervisor:* Prof. Veljko Potkonjak  
*Project:* EU FP7 project ECCEROBOT (Embodied Cognition in a Compliantly Engineered Robot)  
*Outlook:* Modeling and control system design for non-compliant and passively compliant, antagonistically actuated joints in robotic systems; Multi-body kinematics, dynamics, and control; Gravity Compensation; Adaptive Control; Contact Tasks.
- 09/2008 – 10/2008     **Internship, Institute for Electrical Machines, Drives and Controls, University of Siegen, Germany**  
*Supervisor:* Prof. Dr.-Ing. Günter Schröder  
*Project outlook:* Modelling and power loss calculation for single and matrix RB-IGBTs in AC/AC converters using Simulink and SimPowerSystems toolboxes in MATLAB.

## TEACHING EXPERIENCE

- F2011     **Linear System Theory** headed by Prof. John Lygeros, Institute of Automatic Control, ETH Zurich, Switzerland; *graduate-level, around 80 students.* Taught student exercise classes, assisted in homework/exam preparation and correction, student support and tutoring.
- S2011     **Signals and Systems 2** headed by Prof. John Lygeros, Institute of Automatic Control, ETH Zurich, Switzerland. *undergraduate-level, around 300 students.* Taught student exercise classes, assisted in homework/exam preparation and correction, student support and tutoring.

## SUPERVISION EXPERIENCE

- 09/2011 – 09/2012     **Student projects supervisor**, ETH RoboCup project headed by Prof. John Lygeros, Motion Control group, Institute of Automatic Control, ETH Zurich, Switzerland, *Tasks:* Supervision of Bachelor and Master students semester thesis
- MSc Semester Projects* (semester-long research project, equivalent to 6 weeks of full-time work)
- S2012     Christoph Müri, “Stabilizing Aldebaran's NAO H25 in a single support phase in different tasks”, ETH RoboCup project, Motion Control Group, ETH Zurich, Switzerland.

*BSc Group Projects* (semester-long research project, equivalent to 4 weeks of full-time work)

- S2012 Federico Wadehn and Salomon Diether, "Introduction to humanoid robot modeling, numerical approaches to inverse kinematics, and a kinematic model of the Aldebaran's NAO H25", ETH RoboCup project, Motion Control Group, ETH Zurich, Switzerland.
- S2012 Konrad Schieban and Ivo de Concini, "Parametrized open-loop kicking for the Aldebaran's NAO H25", ETH RoboCup project, Motion Control Group, ETH Zurich, Switzerland.

## PROFESSIONAL ACTIVITIES

Conference Reviewing

- 2013 American Control Conference (ACC)

## GRADUATE SCHOOLS

- 2011 4<sup>th</sup> HYCON2 PhD School on Control of Networked and Large-scale Systems, Trento, Italy

## INDUSTRIAL EXPERIENCE

**Period:** 9 months, February 2013 – October 2013

**Company:** Enexra Tools GmbH/ Sillectra GmbH – a spin-off company of the University of Zurich, Department of Informatics, Artificial Intelligence Lab, Zurich, Switzerland

**Role:** Research and Development Mechatronics Engineer

**Field:** Semiconductor Manufacturing Industry

- Responsibilities/Activities:**
- Responsible for Embedded Control and Monitoring Hardware for "Semi-automatic robotic system for kerf-free silicon wafer production", from concept phase to implementation and testing
  - Providing input from control system perspective during concept phase of new prototype wafer manufacturing machines
  - Modeling and Simulation of relevant physical processes (temperature control, multiple zones) important for the manufacturing and Design of Control Systems for these processes (in Matlab)
  - Development and Implementation of Real-Time Embedded Hardware (custom electronics to interface multiple actuators in combinations with NI CompactRIO and NI Multifunctional DAQ) for prototype wafer manufacturing machines
  - Development of a cost-effective casing and wiring for a cryogenic temperature sensor on a chip, implementation, and testing of the sensor; Several versions of the sensor casing and wiring; Improvement of the design proven in experimental tests
  - Programming of Real-Time Monitoring and Control Software and Graphical User Interface in NI LabVIEW
  - Testing of the prototype machines in production; Two working prototype machines finished
  - Suggesting improvements for next version of the prototype machine and development of new mechatronic production systems
  - Proposing prototype designs to improve the wafer production process and a measurement system to gain deeper insight into the production process in order to try to control it later on.
  - Preparing research and development reports. Presenting results to the management and other employees. Direct reporting to CTO.

## ADDITIONAL COURSES

- 04/2014 – present      Climate-KIC PhD Added Value Programme
- 07/2010 – 08/2010      Ministry of Science and Technological Development, Belgrade, Serbia,  
*Description:* Introduction to the structure and operation of the ministry, management trainings, and scientific round tables.

## AWARDS

- 2010      Award for the best young author's paper - B. Svetozarevic, K. Jovanovic, *Control of Compliant Anthropomorphic Robot Joint*, The 54th ETRAN Conference, Donji Milanovac, Serbia.
- 2008      Award (the 2nd place) for the diploma thesis at the Faculty of Electrical Engineering, University of Belgrade, joint work with Marko Šušić on nonlinear, multivariable magnetic levitation system.
- 2008      Award for the best graduate student at the Signals and Systems Department, Faculty of Electrical Engineering, University of Belgrade.
- 2006, 2007      Award for the best student at the Signals and Systems Department, Faculty of Electrical Engineering, University of Belgrade.

## SCHOLARSHIPS

- 2011      Scholarship for doctoral studies abroad, Ministry of Youth and Sport, Serbia.
- 2008 – 2009      City of Belgrade scholarship, for the top 160 students from all universities in Belgrade.
- 2001 – 2009      Scholarship from the Ministry of Youth and Sports, Serbia, for excellence in studying.
- 2008      Scholarship of the Serbian Business Club – “Privrednik”, for the best 70 students from all universities in Serbia.

## SKILLS AND INTERESTS

- Technical Computing      Matlab/SIMULINK, Mathematica, YALMIP, CPLEX
- Programming      C/C++, Java, SQL
- Real-Time Control System Implementation      NI LabView, MathWorks xPC Target, Texas Instruments Microcontrollers  
Siemens Step 7, SCADA system design, VHDL
- Software      Microsoft Office, Latex, Apple iWork, Autodesk Inventor 3D CAD
- Languages      Serbian – mother tongue, English – fluent, German – basic knowledge
- Sports and Hobbies      Basketball, Volleyball, Skiing, Ice skating, Playing Guitar

## REFERENCES

- Prof. Dr Rolf Pfeifer, Artificial Intelligence Lab, University of Zurich, Switzerland  
Prof. Dr Veljko Potkonjak, Faculty of Electrical Engineering, University of Belgrade, Serbia  
Prof. Dr Željko Đurović, Faculty of Electrical Engineering, University of Belgrade, Serbia  
Prof. Dr Dejan Popović, Faculty of Electrical Engineering, University of Belgrade, Serbia  
Dr. Lukas Lichtensteiger, Enexra Tools GmbH/Sillectra GmbH, Switzerland  
Dr. Maryam Kamgarpour, Institute of Automatic Control, ETH Zurich, Switzerland

Detailed contact information upon request.

## PUBLICATIONS

Google Scholar Citations: 77, h-index: 5, i10-index: 4.

### *Journal papers*

- S. Wittmeier, C. Alessandro, N. Bascarevic, K. Dalamagkidis, A. Diamond, M. Jäntschi, K. Jovanovic, R. Knight, H. G. Marques, P. Milosavljevic, **B. Svetozarevic**, V. Potkonjak, R. Pfeifer, A. Knoll, and O. Holland, *Toward Anthropomorphic Robotics: Development, Simulation, and Control of a Musculoskeletal Torso*, Artificial Life, Vol. 19, pp. 171-193, January 2013.
- V. Potkonjak, **B. Svetozarevic**, K. Jovanovic, O. Holland, *The puller-follower control of compliant and noncompliant antagonistic tendon drives in robotic systems*, International Journal of Advanced Robotic Systems, Vol. 8, pp. 143-155, January 2012.

### *Conference papers*

- **Svetozarevic, B.**, Z. Nagy, D. Rossi, and A. Schlueter, *Experimental Characterization of a 2-DOF Soft Robotic Platform for Architectural Applications*, Robotics: Science and Systems, Workshop on Advances on Soft Robotics, UC Berkeley, 2015.
- **Svetozarevic, B.**, P. Mohajerin Esfahani, M. Kamgarpour, and J. Lygeros, *A robust fault detection and isolation filter for a horizontal axis variable speed wind turbine*, Proceedings of the American Control Conference, Washington DC, June 2013.
- Potkonjak, V., K. Jovanovic, **B. Svetozarevic**, O. Holland, D. Mikicic, *Modelling and control of a compliantly engineered anthropomorphic robot in contact tasks*, Proceedings of the 35th Mechanisms and Robotics Conference - ASME, Washington, DC, USA, August 2011.
- Potkonjak, V., **B. Svetozarevic**, K. Jovanovic, O. Holland, *Anthropomorphic Robot with Passive Compliance – Contact Dynamics and Control*, Proceedings of the 19th IEEE Mediterranean Conference on Control and Automation, pp. 1059-1064, Corfu, Greece, June 2011.
- Potkonjak, V., **B. Svetozarevic**, K. Jovanovic, O. Holland, *Biologically Inspired Control of a Compliant Anthropomorphic Robot*, Proceedings of the 15th IASTED International Conference on Robotics and Applications, pp. 182-189, Cambridge, Massachusetts, USA, November 2010.
- Potkonjak, V., **B. Svetozarevic**, K. Jovanovic, O. Holland, *Control of Compliant Anthropomorphic Robot Joint*, Proceedings of the 8th International Conference of Numerical Analysis and Applied Mathematics, pp. 1271-1274, Rhodes, Greece, September 2010.