Veaceslav Spînu *(version Jan. 2014)*

Date and place of birth:	17.11.1983, Chisinau, Republic of Moldova
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PROFILE

Skilled professional with strong background in control systems field, not afraid of "impossible problems" which require non-trivial thinking. In fact, looking forward towards intellectually engaging challenges within the high-tech environment. Likes interdisciplinary projects where a broad range of skills and knowledge is required. Preferred working tools are: creativity, in depth understanding of the problem, and perseverance.

EDUCATION

University Education

PhD. research on "Constrained control of power converters", under the supervision of M. Lazar and P.P.J. van den Bosch, in Control Systems group, Department of Electrical Engineering, Eindhoven University of Technology, The Netherlands. Defense date: Jan. 29, 2014.

MSc. "Advanced Techniques for Process Control" in the Department of Automatic Control and Compute Engineering, Technical University of Iasi "Gh. Asachi", Romania. Thesis: "Light UAV control", supervised by C. Lazar. (2009)

BSc. Ir. "Automatic Control and Applied Informatics" in the Department of Automatic Control and Compute Engineering, Technical University of Iasi "Gh. Asachi", Romania. Thesis: "Unsupervised Image Segmentation Using Hardware Implemented in FPGA Neural Networks", supervised by O. Pastravanu. (2008)

Additional courses

HYCON 2 PhD school on "Control of Networked and Large-Scale Systems" in IMT Lucca, Italy (2013).
National Instruments courses on High Throughput FPGA design and FlexRIO FPGA targets (2012).
Dutch Institute of Systems and Control (DISC) winter course "Modelling, simulation, control and optimization with differential-algebraic systems", presented by Prof. Volker Mehrmann from TU Berlin (2011).
DISC courses on Nonlinear, Stochastic and Model predictive control.
PROOF program for PhD. Students organized at the TU/e and include courses on Entrepreneurship, Presentation and Scientific Writing skills among others.

RESEARCH

Scientific Interests

Model Predictive Control
Set Theoretic Methods in Control
Real-time control of high speed systems
Reconfigurable hardware
Robotics

Publications and Presentations (see Appendix for more details)

Coauthored 1 journal article, 1 book chapter and 9+ conference papers
Invited talk at NIWeek2012 at Energy Technology Summit
Co-presenter of one IEEE Spectrum webinar
Co-author of a workshop presentation at the CPSWeek 2013

Recent Research Projects	"Ultra High-precision Power Amplifier" (Dutch Ministry of Economic Affairs under the identifier IOP-EMVT-II:08201). The goal of this project is to develop the control and power stage design methodologies for next generation precision power amplifiers. My task is the design of advanced control algorithms for the amplifier. The main tools in the proposed control designs are set-theoretic methods and model predictive control. "MOBY-DIC" (European Commission Project FP7-CNECT-ICT-248858) MOBY-DIC project focusses on model based synthesis of digital electronics circuits for embedded control. My responsibility was to develop a case-study and validate the MOBY-DIC tools in control of switched mode power supplies. "Research on Improving Mecanum Wheel Performance, Design of an Omni-directional Vehicle" (Grant CNCSIS ID-622,Nr. 84/01.10.2007) A research project at Faculty of Mechanical Engineering from Technical University of Iasi aimed to investigate the possibilities of improving the performance of an omni-directional Mecanum wheel. I was in charge with the design of control algorithms for the initial prototype of the mobile platform.

PERSONAL SKILLS AND COMPETENCES

Theoretical Background	System Theory, Control Algorithms, System Modeling, Robotics, Electronics, Software and Hardware Architectures, Physics, Mathematics.
Applied Software	Embedded programming and hardware description (C, Verilog/VHDL) (6 years) Matlab/Simulink (5 years) LabView [RT/FPGA/base] (3 years)
Hardware	Embedded System Design, RF-ID Technology, Wired/Wireless Communications, Analogous and Digital Sensors Interfaces, prototyping and manufacturing of PCBs, Power Electronics and Motor Control. Familiar with PIC, MCS51, C16x, HCS12 microcontroller architectures, Xilinx FPGA devices and National Instruments embedded targets.
Social and managerial skills	Working experience in interdisciplinary teams, occasionally, as a team leader. Former vice-president of Student Robotic Club from Technical University of Iasi "RUTIS", part of the core organizing group of RUTIS robotic competitions and workshops. Hard working person and very passionate about technology.
Work experience	Since 2010, doctoral candidate at TU/e. Also, co-supervised 1 BSc. and 4 MSc. end projects. Before 2010, project based work in cooperation with "Paireli & C, System Engineering" and "Smart Tech Design" with attributes of software/hardware/control system developer.
Language skills	Native bilingual in Romania and Russian; good command of English; basic in French and Dutch.
Hobbies and passions	Mountain biking and other outdoor sports, UAV design,

APPENDIX: SUMMARY OF PUBLICATIONS AND PRESENTATIONS

Journal Articles & Book Chapters

- ✓ V. Spinu, N. Athanasopoulos, M. Lazar and G. Bitsoris, *"Stabilization of bilinear power converters by affine state-feedback under input and state constraints"*, in IEEE Transactions on Circuits and Systems. Part II: Express Briefs, 59(8), 2012, pp. 520-524.

- ✓ I. Doroftei, V. Grosu and V. Spinu, *"Omnidirectional Mobile Robot - Design and Implementation"*, Bioinspiration and Robotics Walking and Climbing Robots, Maki K. Habib (Ed.), ISBN: 978-3-902613-15-8, InTech, DOI: 10.5772/5518, 2007. Available http://www.intechopen.com/books ... design_and_implementation.

Conference Proceedings

- ✓ V. Spinu, J.M. Schellekens, M. Lazar, M.A.M. Hendrix, *"On real-time optimal control of high-precision power amplifiers",* in Proceedings of 17th International Conference on System Theory, Control and Computing, Sinaia, Romania, October 11-13, 2013, pp. 507-514.

- ✓ F.A. Qureshi, V. Spinu, C.G.E. Wijnands and M. Lazar, *"A real-time control system architecture for industrial power amplifiers",* in Proceedings of the American Control Conference, Washington, DC, USA, June 17-19, 2013, pp. 4510-4515.

- ✓ V. Spinu and M. Lazar, *"Integration of real-time and stability constraints via hybrid polytopic partitions"* In Proceedings of IEEE International Conference on Control Applications, Dubrovnik, Croatia, October 3-5, 2012, pp. 226-233.

- ✓ V. Spinu, A. Oliveri, M. Lazar and M. Storace, *"FPGA implementation of optimal and approximate model predictive control for a buck-boost DC-DC converter",* in Proceedings of IEEE International Conference on Control Applications, Dubrovnik, Croatia, October 3-5, 2012, pp.1417-1423.

- ✓ V. Spinu, and M. Lazar, *"A hybrid polytopic partition approach to constrained stabilization of bilinear systems"*, in Proceeding of the IFAC Nonlinear Model Predictive Control Conference, Noordwijkerhout, The Netherlands, August 23-27, 2012, pp. 430-435.

- ✓ V. Spinu, M. Dam and M. Lazar, *"Observer design for DC/DC power converters with bilinear averaged model",* in Proceedings of IFAC Conference on Analysis and Design of Hybrid Systems, TU Eindhoven, The Netherlands, June 6-8, 2012, pp. 204-209.

- ✓ V. Spinu, V., M. Lazar and P.P.J. van den Bosch, *"An explicit state-feedback solution to constrained stabilization of DC-DC power converters",* in Proceedings of the IEEE International Conference on Control Applications, Denver, CO, USA, September 28-30, 2011, pp.1112-1118.

- ✓ V. Spinu, M. Lazar and G. Bitsoris, *"Constrained stabilization of a two-input buck-boost DC/DC converter using a set-theoretic method",* in Proceedings of the American Control Conference, San Francisco, CA, USA, June 29 – July 1, 2011, pp.5394-5399.

- ✓ V. Spinu, M. Lazar and P.P.J van den Bosch, *"On low complexity model predictive control of DC/DC converters",* in Proceedings of 14th International Conference on System Theory and Control, Sinaia, Romania, October 17-19, 2010, pp. 525-530. Available online at: http://www.ace.ucv.ro/sintes14/ICSTC_2010_Conference_Proceedings.pdf

Other presentations

- ✓ V. Spinu and M. Lazar, *"Controller design under hardware, safety and performance constraints"*, presented by M. Lazar CPSWeek Workshop on Computation and Control, Philadelphia, PA, USA, April 8, 2013. Available online at http://www.control.lth.se/comco/program.html
- ✓ V. Spinu, *"An introduction to set-theoretic methods in control of power converters",* presented as part of the IEEE Spectrum Webinar on Power Converter Controller Design for Smart Grid Power Electronics, September 25, 2012. Available online at http://zone.ni.com/wv/app/doc/p/id/wv-3638.

- ✓ V. Spinu, M. Lazar, P.P.J van den Bosch, *"A full-proof development cycle for the power converter control system"*, Invited talk at the Energy Technology Summit during the NIWeek, Austin, TX, USA, 2012. Available online at http://zone.ni.com/wv/app/doc/p/id/wv-3638.

- ✓ V. Spinu, V. Grosu, I. Doroftei, *"Modeling and Control of an Omni-Directional Vehicle with Mecanum Wheels"*, presented at 9th International Symposium on Automatic Control and Computer Sciene, Iasi, Romania, November 2007.