

Dr. Konstantin Selyunin

Curriculum vitæ



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Dammstr. 34/1
1200 Vienna, Austria
Visum: RWR+
Date of Birth: 04 October 1987

Education

- 2012–2017 **Dr.techn.**, *Technische Universität Wien (TU Wien)*, Vienna, Austria, Neural Models for Monitoring and Control with Applications in Automotive Domain.
- PhD thesis: excellent score for the written thesis and defense presentation
 - 16 PhD & Master Courses (56 ECTS) successfully completed, 1.06 average ("1" corresponds to the excellent note)
 - The research results presented at AVM'15, CDC'15, DATE'16, DVCON'16, MTCPS'16, DAC'16, RV'16, IWANN'17, CAV'17, group and project meetings
- 2005–2010 **Dipl.Ing.**, *Omsk State Transport University*, Omsk, Russia, *with Distinction*.
Speciality: "Automation remote control and communications on railway transport".
Major "Microprocessor- and information control systems".

Experience

- 2014–2017 **Project Assistant**, *Technische Universität Wien (TU Wien)*, Vienna, Austria, **Hardware Monitoring for Automotive (HARMONIA) 845631 FFG project**.
Development of hardware runtime monitors for checking formal properties expressed in Signal Temporal Logic and Timed Regular Expressions.
- Application of High-Level Synthesis of synthesizing hardware runtime monitors
 - A complete flow from natural language specification to hardware generation
 - Application IBM's TrueNorth model for creating MTL monitors
 - Embedding SystemC runtime monitors in a chip concept
 - Project Website administrator and maintainer
- 2010–2012 **University Assistant**, *Omsk State Transport University*, Omsk, Russia.
Teaching assistant for the "Foundations of Microprocessor Technology" course.
- Preparing course content, labs, supervising students.

Technical skills

Programming languages: C/C++, Python, R, Ruby, Cuda C, Scala, MATLAB/Simulink, Octave, Mathcad, VHDL

Operating Systems: Linux, Windows

Robotic frameworks: ROS

Deep Learning Libraries: TensorFlow, Keras

IDEs: Eclipse, Vivado

Text typesetting: vim, L^AT_EX, MS Office

Bugtracking systems: Redmine (configuration & maintenance)

PAAS, IAAS: Heroku, Amazon EC2, S3

Languages

English	Fluent	<i>Full professional proficiency</i>
German	Advanced	<i>C1 certificate</i>
Russian	Fluent	<i>Mother language</i>

Publications

- [NBN⁺16] Thang Nguyen, Ezio Bartocci, Dejan Nickovic, Radu Grosu, Stefan Jaksic, and Konstantin Selyunin. The HARMONIA Project: Hardware Monitoring for Automotive Systems-of-Systems. In *Proc. of Leveraging Applications of Formal Methods, Verification and Validation: Discussion, Dissemination, Applications - 7th International Symposium, ISoLA 2016, Corfu, Greece, October 10-14*, pages 371–379, 2016.
- [SJN⁺17] Konstantin Selyunin, Stefan Jaksic, Thang Nguyen, Christian Reidl, Udo Hafner, Ezio Bartocci, Dejan Nickovic, and Radu Grosu. Runtime Monitoring with Recovery of the SENT Communication Protocol. In *Proc. of the 29th International Conference on Computer Aided Verification, CAV 2017, Heidelberg, Germany, July 24-28*, pages 336–355, 2017.
- [SNB⁺16a] Konstantin Selyunin, Thang Nguyen, Ezio Bartocci, Dejan Nickovic, and Radu Grosu. Monitoring of MTL Specifications With IBM's Spiking-Neuron Model. In *Proc. of the 19th Design, Automation and Test in Europe Conference and Exhibition, DATE 2016, Dresden, Germany, March 14-18*, pages 924–929, 2016.
- [SNB⁺16b] Konstantin Selyunin, Thang Nguyen, Andrei Daniel Basa, Ezio Bartocci, Dejan Nickovic, and Radu Grosu. Applying High-Level Synthesis for Synthesizing Hardware Runtime STL Monitors of Mission-Critical Properties. In *Electronic Proc. of the 13th Design and Verification Conference and Exhibition, DVCon 2016, San Jose, CA, USA, February 28- March 3*, pages 1–8, 2016.
- [SNBG16] Konstantin Selyunin, Thang Nguyen, Ezio Bartocci, and Radu Grosu. Applying Runtime Monitoring for Automotive Electronic Development. In *Proc. of the International Conference on Runtime Verification, RV 2016, Madrid, Spain, September 23-30, 2016*, pages 462–469, 2016.
- [SRB⁺15] Konstantin Selyunin, Denise Ratasich, Ezio Bartocci, Md. Ariful Islam, Scott A. Smolka, and Radu Grosu. Neural Programming: Towards adaptive control in Cyber-Physical Systems. In *Proc. of the 54th IEEE Conference on Decision and Control, CDC 2015, Osaka, Japan, December 15-18, 2015*, pages 6978–6985, 2015.

Conference presentations

- 2017 The 29th International Conference on Computer Aided Verification, (CAV 2017), Heidelberg, Germany [SJN⁺17]
- 2016 The 16th RV conference and exhibition (RV 2016), Madrid, Spain [SNBG16]
- 2016 The 53rd DAC conference and exhibition (DAC 2016), Austin, Texas, United States (Work-in-progress presentation)

- 2016 The 19th DATE conference and exhibition (DATE 2016), Dresden, Germany [SNB⁺16a]
- 2016 The 28th Design and Verification conference and exhibition (DVCon 2016), San Jose, CA, United States [SNB⁺16b]
- 2015 The 54th IEEE Conference on Decision and Control (CDC 2015), Osaka, Japan [SRB⁺15]

Additional Courses & Projects

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| 2017 Traffic Sign Recognition with Convolutional Neural Network | <i>Python project</i> |
| 2017 Lane Lines Detection with OpenCV | <i>Python project</i> |
| 2017 Cyton Gamma 300 & Movelt: Demo | <i>ROS project</i> |
| 2016 Xilinx High-Level Synthesis, CoreVision, Heesch, The Netherlands | <i>on-site course</i> |
| 2015 Internet of Things, University of California, San Diego | <i>online course</i> |
| 2014 Linear and Integer Programming, University of Colorado Boulder | <i>online course</i> |
| 2014 Functional Programming Principles in Scala, ÉPFL | <i>online course</i> |
| 2014 Machine Learning, Stanford University | <i>online course</i> |
| 2013 Software as a Service, BerkeleyX CS169.1x | <i>online course</i> |
| 2013 Writing in the Sciences, Stanford Online | <i>online course</i> |

Peer-reviewing conference papers

ICCPS'2018, RV'2017, CMSB'2017, SPIN'2017, RTNS'2016, ICCP'2016, NFM'2016, DATE'2016, FORMATS'2015, ISORC'2015, ICFEM'2014, RV'2014.

Interests

Sports: Running, swimming, biking, chess
 Music: Accordion

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