



gergelytakács

*"Prediction is difficult, especially about the future."
- Niels Bohr*

Education

- 2006–2009 **PhD, Mechatronics**, *Slovak Technical University in Bratislava, Faculty of Mechanical Engineering, Bratislava, Slovakia.*
- 2004–2006 **MS, Mechatronics with High Distinction**, *Slovak Technical University in Bratislava, Faculty of Mechanical Engineering, Bratislava, Slovakia.*
- 2001–2004 **BS, Mechatronics with High Distinction**, *Slovak Technical University in Bratislava, Faculty of Mechanical Engineering, Bratislava, Slovakia.*
- 2000–2001 **High school**, *Lafayette High School, Missouri, United States.*
- 1997–2000 **High school**, *Vámbery Ármin High School, Dunajská Streda, Slovakia.*

Research and Teaching

Research

- 2009–2011 **Post-doctoral research**, *Slovak Technical University in Bratislava, Bratislava, Slovakia.*
 - Active vibration control
 - Computationally efficient MPC algorithms for vibration control
 - Nonlinear state and parameter estimation in vibration control
 - Adaptive-predictive vibration control
 - Smart materials in vibration control
 - Embedded optimization-based control and estimation for vibration control
- November 2010 **Academic visitor**, *NTNU, Trondheim, Norway.*
 - brief research stay on efficient MPC and state observation
 - hosted by Tor Arne Johannsen
- Autumns of 2006–2008 **Academic visitor**, *University of Oxford, Oxford, UK.*
 - Research on efficient MPC algorithms for vibration control
 - Supervised by Basil Kouvaritakis and Mark Cannon
- 2006–2009 **Doctoral Research**, *Slovak Technical University in Bratislava, Bratislava, Slovakia.*
 - Active vibration control
 - Computationally efficient MPC algorithms for vibration control
 - FEM of active vibration control structures
 - Supervised by Boris Rohal-Ilkiv

- 2004–2006 **Graduate Research**, *Slovak Technical University in Bratislava*, Bratislava, Slovakia.
 - Studied the application of control algorithms in FEM software, welding simulation
 - Authored a brief book based on the resulting master's thesis
 - Supervised by Roland Jančo
- 2003–2004 **Undergraduate Research**, *Slovak Technical University in Bratislava*, Bratislava, Slovakia.
 - Studied the design of hybrid electric vehicle drivetrains
 - Co-authored two conference articles based on the resulting bachelor's thesis
 - Supervised by Ján Vluka

Teaching

- 2011–2014 **Lecturer**, *Slovak Technical University in Bratislava*, lectures, graduate level, Adaptive and Predictive Control Systems.
- 2014 **First Author of a Textbook**, *Slovak Technical University in Bratislava*, textbook, graduate level, First author of an instructive textbook on system identification (In press. Slovak language.).
- 2011–2014 **Bachelor's Thesis Supervisor**, *Slovak Technical University in Bratislava*, undergraduate level, Supervised 6 bachelor's theses.
- 2012–2014 **Master's Thesis Supervisor**, *Slovak Technical University in Bratislava*, graduate level, Supervised 4 bachelor's theses.
- 2009–2014 **Teaching Assistant**, *Slovak Technical University in Bratislava*, laboratory seminars, graduate level, Adaptive and Predictive Control Systems.
- 2009–2014 **Teaching Assistant**, *Slovak Technical University in Bratislava*, laboratory seminars, graduate level, Discrete Control Systems.
- 2009–2010 **Teaching Assistant**, *Slovak Technical University in Bratislava*, laboratory seminars, undergraduate level, Mechatronics.
- 2009–2010 **Teaching Assistant**, *Slovak Technical University in Bratislava*, laboratory seminars, undergraduate level, Electrical Engineering.

Selected Congress and Conference Presentations

- 2014 **IFAC WC 2014**, *19th IFAC World Congress*, Cape Town, South Africa, Adaptive predictive control of transient vibrations of cantilevers with changing weight.
- 2014 **ICSV21**, *International Congress on Sound and Vibration*, Beijing, China, Pseudo Real-Time State and Parameter Estimation of a Vibrating Active Cantilever Using the Moving Horizon Observer.
- 2013 **ICSV20**, *International Congress on Sound and Vibration*, Bangkok, Thailand, Adaptive model predictive vibration control with state and parameter estimation using extended Kalman filtering.
- 2012 **Inter-Noise 2012**, *Inter-Noise*, New York, USA, Model predictive vibration control of a mechanical structure using shape memory alloy actuation.
- 2009 **NOVEM2009**, *Noise and Vibration: Emerging Methods*, Oxford, UK, Implementation of the Newton-Raphson MPC algorithm in active vibration control applications.
- 2009 **CA2009**, *11th Control and Application*, Cambridge, UK, MPC with guaranteed stability and constraint feasibility on flexible vibrating active structures: a comparative study.

Publications and Awards

Summary

2006–2012 **Publication summary**, Author and co-author of 4 books, 3 book chapters, 15 journal articles, 22 conference articles.

Selected Publications

- 2014 **G. Takács and B. Rohal'-Ilkiv**, *Model predictive control algorithms for active vibration control: a study on timing, performance and implementation properties*, Journal of Vibration and Control, ISSN: 1077-5463 (preprint, June 2013).
- 2014 **G. Takács, T. Polóni and B. Rohal'-Ilkiv**, *Adaptive Model Predictive Vibration Control of a Cantilever Beam with Real-Time Parameter Estimation*, Shock & Vibration, ISSN: 1070-9622. Vol. 2014, Art. ID 741765.
- 2012 **G. Takács and B. Rohal'-Ilkiv**, *Model Predictive Vibration Control : Efficient Constrained MPC Vibration Control for Lightly Damped Mechanical Structures*, Springer Verlag London, ISBN 978-1-4471-2332-3, (Top 25% sales in relevant category at Springer.).
- 2009 **G. Takács and B. Rohal'-Ilkiv**, *Newton-Raphson based efficient model predictive control applied on active vibrating structures*, In: European Control Conference 2009. ECC '09 : Budapest, Hungary, 23.-26.8.2009. ISBN 978-963-311-369-1. pp. 2845-2850, (Cited in two US Patents.).

Full publication list available on request..

Awards and Recognition

- 2014 **Arany János Award**, *Hungarian Academy of Sciences*, Award for outstanding young scientists by the Hungarian Academy of Sciences.
- 2014 **Invited Speaker**, *European Acoustics Association*, Invited conference speech at the Forum Acusticum 2014, Cracow, Poland.
- 2014 **Travel Award**, *Slovak Literature Fund*, Travel award for congress participation, based on reviewed article.
- 2012 **Book interest**, *Springer*, Sales of the book "Model Predictive Vibration Control" and its chapters amongst the top 25% of the relevant category.
- 2010 **Best Presentation Award**, *COMSOL Conferences*, Best presentation by popular choice, COMSOL Conference 2010, Bangalore, India.
- 2006 **Best Master's Thesis**, *Slovak Technical University in Bratislava*, Institute award for best master's thesis..
- 2004 **Best Grades**, *Slovak Technical University in Bratislava*, Dean's award for student with best grade point average..

Computer skills

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Math Packages:	Matlab, Simulink	Programming:	M-script, APDL, HTML, some C/C++, Arduino, ActionScript
CAD and FEM:	AutoCAD, CATIA, ANSYS	Graphics and DTP:	Photoshop, Illustrator, L ^A T _E X, Visio, Flash
O.S.:	Microsoft Windows, some Linux		

Hardware skills and experience

Smart materials:	piezoceramics, shape memory alloys, electroactive polymers	Shakers:	laboratory shakers, customized impact simulators
Control prototyping:	xPC Target, Windows Real-Time Target	MCU/SOC prototyping:	Arduino Uno, Arduino Due, Arduino Mega2560, STM Discovery
Signal generators:	advanced digital signal generators, analog generators, computerized systems and complex test signal design	Measurement:	oscilloscopes, laboratory measurement cards, data logging, hand-held devices
Auxiliary equipment:	shaker amplifier, capacitive amplifier (piezo), high-voltage amplifier (EAP)	Electronics:	creating simple circuits, laboratory level work
Workshop:	affinity for manual tasks and prototype manufacturing	Others:	geodetic GPS systems, 3D precision coordinate measurement machines, personal computer hardware

Others

Language proficiency

English	fluent	<i>One academic year in the United States and one in the United Kingdom, written several books</i>
Slovak	fluent	<i>Second language, used in everyday contact, written several books</i>
Hungarian	fluent	<i>First language, native speaker</i>
German	basic passive	<i>Basic language courses</i>

Research Grants

- 2011–2014 **APVV-090-10**, *Major Slovak government research grant*, Model predictive control methods with joint state and parameter estimation for fast nonlinear mechatronic systems, (Co-Investigator.).
- 2011–2014 **APVV-0131-10**, *Major Slovak government research grant*, High-tech solutions for technological processes and mechatronic components controlled as distributed parameter systems, (Co-Investigator.).
- 2011–2013 **VEGA 1/0138/11**, *Slovak government research grant*, Control of dynamic systems based on distributed parameter numerical structures, (Co-Investigator.).
- 2011 **STU KATV-MTV**, *Young scientist grant program of the Slovak University of Technology in Bratislava*, Composite Actuators for Vibration Control using Shape Memory Alloys, (Awarded / Principal Investigator.).
- 2010 **STU ATVNSP-VEPA**, *Young scientist grant program of the Slovak University of Technology in Bratislava*, Active vibration control and deployment of solar panels using computationally efficient predictive algorithms, (Awarded / Principal Investigator.).
- 2009–2011 **NIL-I-007-d**, *Norwegian-Slovak joint cooperation*, Enhancing NO-SK Cooperation in Automatic Control (ECAC), (Co-Investigator.).
- 2007–2009 **APVV-0280-06**, *Slovak government research grant*, Model predictive control of mechatronic systems with fast dynamics and process constraints, (Co-Investigator.).

- 2008–2010 **APVV-0160-07**, *Slovak government research grant*, Advanced modeling, control and design methods for lumped input and distributed output mechatronic systems, (Co-Investigator.).
- 2008–2010 **VEGA 1/0036/08**, *Slovak government research grant*, Advanced modeling, control and design methods for distributed parameter systems, (Co-Investigator.).
- 2007–2008 **SORO/JPD3-080/2005**, *European Social Fund (ESF) research grant*, Doctoral students for the modern industrial automation in the Slovak Republic, (Participant.).