CURRICULUM VITAE

Name:	Ambrus Miklós ZELEI, PhD
Place and date of birth:	Budapest, Hungary, 16. 03. 1983.
Workplace:	MTA-BME Research Group on
	Dynamics of Machines and Vehicles,
	Department of Applied Mechanics,
	Budapest University of Technology and Economics,
Work address:	Muegyetem rkp. 3-5., H-1111 Budapest, HUNGARY
E-mail:	zelei.ambrus@gmail.com
Homepage	www.mm.bme.hu/~zelei/
Phone number:	+36 1 463 36 78; +36 70 414 0110



STUDIES

STODIES	
PhD, Department of Applied Mechanics, Budapest University of Technology and Economics	2015
MSc, Teacher of Engineering Sciences, Budapest University of Technology and Economics	2009
MSc, Mechanical Engineering, Budapest University of Technology and Economics Specialization of Applied mechanics and Fluid mechanics thesis work at University of Bristol, UK	2007
POSITIONS	
Research associate, MTA-BME Human Balancing Research Group	2017 –
Research associate, MTA-BME Rsrch gr. on Dynamics of Machines and Vehicles	2015 –
Research assistant, MTA-BME Rsrch gr. on Dynamics of Machines and Vehicles	2010 – 2015
RESEARCH PROJECTS AND WORKING EXPERIENCE	
NKFIH-FK18 128636 (Principal Investigator)	2018 –
Dynamics of human and artificial legged locomotion – running towards model- based predictions.	
Developement ACG-SIM aircraft simulator	2017 –
Innovative Teaching and Popularization of Robotics for 6-18 Age-Group	2015 –
EVRYON project (FP7-ITC-2007.8.5 #231451)	2011 – 2012
Project aim: development of a novel approach for the design of wearable robots. My work was about the dynamical modeling and control design of the servo driver system.	
INNOCSEKK project (INNO_08_KM-HIDARAML)	2009 – 2010
The project aim was to develop a method for the coupled simulation of the wind induced flutter instability of aeroelastic structures, especially bridges. My work was about analytical stability calculations for reduced bridge models and calculation of flutter derivatives based on experimental data.	
ACROBOTER project (FP6-IST-2006-045530)	2008 – 2011
Project aim: development of a new service robot platform which is based on a radically new robot locomotion technology. My work was about the dynamical modeling and motion control of the under-actuated ACROBOTER robot.	
Professional practice at Knorr-Bremse Fékrendszerek Kft., Budapest, Hungary. Testing of control software of commercial vehicle brake system	2006, one month
Professional practice at Paks Nuclear Power Plant, Paks, Hungary. Working with metal-cutting machines	2001, one month
ELMŰ, Electric Power Supplier Company, Budapest, Hungary. Power networks, public lighting maintenance	2000, one month
Teaching assistant at Department of Applied Mechanics in academic year	2005/2006, spring
Teaching assistant at Department of Applied Mechanics in academic year	2005/2006, autumn
TEACHING ACTIVITIES	
Lecturer in: Basics of Mechanisms (BSc, Hun.), Mechanisms (MSc, Hun. and Eng.) Dynamics of Mechanical Systems (MSc, Hun.), Dynamics of Robotmechanisms (BSc, Eng.)	2014 –
Tutorial in: statics, strength of materials, dynamics, vibrations, finite element method	2007 – 2014

Supervised BSc theses:	33
Supervised MSc theses:	22
Supervised PhD projects:	3 (3 ongoing)
Supervised TDK (University Scientific Student's Conference) works:	26 (places: 1 st : 7, 2 nd : 6, 3 rd : 7
Supervised OTDK (National Scientific Student's Conference) works:	10 (places: 1 st : 1, 2 nd : 2, 3 rd : 2

SCIENTIFIC AWARDS

Special award for supervisors, National Scientific Student's Conference, 2011. First place of National Scientific Student's Conference 2007, Section Technical Sciences Second place of National Scientific Student's Conference 2007, Section Technical Sciences First place of National Scientific Student's Conference 2007, Section Pedagogy and Education Technology First place of University Scientific Student's Conference 2006, Section Applied Mechanics Second place of University Scientific Student's Conference 2006, Section Applied Mechanics First place of University Scientific Student's Conference 2006, Section Ergonomics and Psychology First place of University Scientific Student's Conference 2005, Section Applied Mechanics Third place of University Scientific Student's Conference 2004, Section Applied Mechanics

LANGUAGE SKILLS

English (fluent speaking and writing), Russian (beginner)

EXPERIENCE ABROAD

2019 Nanjing University of Aeronautics and Astronautics, China, Guest researcher, 1 week.
2014 Nanjing University of Aeronautics and Astronautics, China, Guest researcher, 2 weeks.
2009: University of Texas at Dallas, USA, Guest researcher, 1 month.
2007: University of Bristol, UK. 1 semester, MSc Thesis.

RESEARCH INTEREST

Digitally controlled dynamic systems Control of underactuated and redundant mechanical systems Dynamics of aero-elastic systems Dynamical systems with time-delay Parametric excitation, non-autonomous systems Multibody dynamics, mechanisms Dynamics of human walking and running

SELECTED PUBLICATIONS

[1] Zelei, A., Krauskopf, B., Piiroinen, P. T., Insperger, T.: Stable periodic motion of a controlled segmented leg model of pedal locomotion with inelastic ground-foot collision. *Nonlinear Dynamics*, **97(3)**, 2019, doi:10.1007/s11071-019-04911-z.

[2] R. R. Zana, B. Bodor, L. Bencsik, A. Zelei.: A Tutorial for the Analysis of the Piecewise-Smooth Dynamics of a Constrained Multibody Model of Vertical Hopping. *Mathematical and Computational Applications*, **23(4)** Special IssueComputational Methods in Interdisciplinary Applications of Nonlinear Dynamics, 2018, doi:10.3390/mca23040074.

[3] László Bencsik, László L. Kovács and Ambrus Zelei: Stabilization of Internal Dynamics of Underactuated Systems by Periodic Servo-Constraints. *International Journal of Structural Stability and Dynamics*, **17(5)**, 2017, doi:10.1142/s0219455417400041.

[4] Ambrus Zelei, Laszlo Bencsik and Gabor Stepan: Handling actuator saturation as underactuation - case study with Acroboter service robot. *Journal of Computational Nonlinear Dynamics*, **12(3)**, 031011. 2016, doi:10.1115/1.4034868.

[5] László Bencsik, Ambrus Zelei: Effects of human running cadence and experimental validation of the bouncing ball model. *Mechanical Systems and Signal Processing*, **89**, 78-87, 2016, doi: 10.1016/j.ymssp.2016.08.001.

[6] Zsolt Szabo, Ambrus Zelei, Gábor Stépán: Stability of an elastic supported flat plate subjected to potential flow. *Periodica Polytechnica – Mechanical Engineering*, **56(2)**, 99-103, 2012.

[7] A. Zelei, L. Bencsik, L. L. Kovács, G. Stépán: Redundancy Resolution of the Underactuated Manipulator ACROBOTER. In proc. *RoManSy 2012 - 19th CISM-IFToMM Symposium on Robot Design, Dynamics and Control*, June 12-15, 2012, Paris, France, pp. 233-240.

[8] L. L. Kovács, A. Zelei, G. Stépán: Computed torque control of an under-actuated service robot platform modeled by natural coordinates. *Communications in Nonlinear Science and Numerical Simulation*, **16(5)** 2205-2217, 2010.

[9] A Zelei, G Stépán: The influence of parametric excitation on floating bodies. PAMM, 8(1) 10929-10930, 2008.

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Ambrus Miklós Zelei, PhD