

Curriculum Vitae

Personal data

Miroslav Vořechovský
Full Professor and Scientist
Institute of Structural Mechanics
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Born on February 7, 1977 in Brno, Czech Republic
married (wife Pavla), 2 children (Martin and Hana)
Czech nationality

Education

- 09/1995–06/2000 Master's degree "Ing." (equiv C-Eng or MSc) Brno University of Technology, Brno, Czech Republic. Diploma thesis: "On reliability calculations of problems of nonlinear continuum mechanics" (in Czech)
- 09/2000–09/2004 Doctoral degree "Ph.D.", Brno University of Technology, Brno, Czech Republic. Dissertation: "Stochastic Fracture Mechanics and Size Effect" (in English)

Awards, honors and scholarships

- 06/2000 Award of Dean, Brno University of Technology (BUT)
- 06/2000 Diploma thesis Award, Brno University of Technology
- 06/2000 Rector's Prize (Chancellor of BUT), Brno University of Technology
- 01/2001 Doctoral scholarship, Hlávka foundation, Prague
- 05/2001 Electricité de France, Conference Stipend of Excellence, FraMCoS, France, Paris, 2001
- 04/2002 Award of Josef Hlávka foundation, Prague
- 05/2002 Travel stipend for conference in Scotland, Dundee
- 09/2002–06/2003 *Preciosa* scholarship
- 09/2002 A good paper award at the 4th International Ph.D. Symposium in Civil Engineering, Munich, Germany
- 05/2003 M.I.T. Young Researcher Fellowship (award), 2nd M.I.T. Conference, Boston, USA
- 06/2003 *Cerra conference award*, ICASP 9 conference, San Francisco, USA
- 09/2003–03/2004 Fulbright Doctoral Fellowship, Northwestern University, Evanston, USA
- 09/2004 Rector's Prize (Chancellor of BUT), Brno University of Technology
- 02/2005 Trimor Research Award 2005, Trimor corporation, Slovenia
- 2006 Professional CV record in Marquis "Who's who in the World 2007", 24th Ed.
- 2007 Award by Engineering academy of the Czech Republic for the best paper in Engineering Mechanics journal in 2006.

2008	Winner of the University competition “Top 10 Excellence VUT 2007” for the most productive scientists at the Brno University of Technology, category “Publications”.
2012	Sixth place in the University competition “Top 10 Excellence VUT 2010” for the most productive scientists at the Brno University of Technology, category “Publications”.

Specialization, research interests

Nonlinear fracture mechanics with focus on stochastic aspects. Size effects, scaling in structures. Behavior of fibers, yarns and fiber-reinforced composites. Efficient methods of reliability engineering, mathematical statistics (random variables, random fields and processes, extreme value theories) connected with nonlinear fracture mechanics methods (research on behavior of quasibrittle materials/structures). Stochastic optimization techniques, structural safety and reliability, stochastic computational mechanics, Monte Carlo simulation techniques, genetic algorithms. Programming and software development.

Memberships, activities

since 09/2000	member of FRAMCoS society (FR acture Mechanics of C oncrete S tructures)
since 01/2004	member of ASCE (American Society of Civil Engineers)
since 02/2005	member of the Czech Society of Mechanics
since 06/2007	member of Cerra – the Civil Engineering and Risk Association
1997–1999	Academic senate and Branch council (Structures and transportation constructions)
09/2000	Member of Local Organizing Committee: Workshop <i>3RE</i> , Institute of Structural mechanics TUB together with Institute of Structural Mechanics, Weimar, Germany
06/2005	Member of Local Organizing Committee: <i>2nd</i> International symposium Nontraditional cement & concrete. Brno University of Technology, Brno, Czech Republic
01/2007	Member of Organizing Committee: Brno University of Technology, Faculty of Civil Engineering, Juniorstav (Scientific PhD international workshop)
2009	Member of local Committee: Brno University of Technology, Faculty of Civil Engineering, Seventh International scientific conference on the occasion of the 110th anniversary of founding the Faculty Civil Engineering and 14th anniversary of Civil Engineering trade fairs in Brno (session 9 - Structural Mechanics)
06/2012	Chair of The fifth conference on Reliable Engineering Computing (REC2012) Brno University of Technology, Faculty of Civil Engineering

International cooperation

since 2003	Prof. Z. P. Bažant Northwestern University, Evanston, Illinois, USA: stochastic fracture mechanics of quasibrittle materials
since 2003	Dr. R. Chudoba, Technical University of Aachen (RWTH Aachen), Germany: stochastic fracture mechanics of textile reinforced concrete, computational mechanics
since 2015	prof J. Bolander, University of California, Davis, CA, USA : discrete models for fiber reinforced concrete

Teaching experience

since 09/2000	Institute of Structural Mechanics, Faculty of Civil Engineering, Brno University of Technology, Brno, Czech Republic: <i>Elasticity & Plasticity</i> <i>Reliability of structures</i> <i>Structural Analysis I</i>
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Structural Mechanics I
Fundamentals of Structural Mechanics
Selected Topics of Structural Mechanics I
Selected Topics of Structural Mechanics II
Nonlinear Mechanics

Participation in research projects

1997–2002	<i>Material models of concrete for the assessment of severe accidents in nuclear industry.</i> Project of the Czech Science Foundation (GACR) GACR 103/97/K003.
2000–2002	<i>Risk assessment of structures - the loss of load-bearing capacity and serviceability of thin-walled structures.</i> Project of the Czech Science Foundation (GACR) 103/00/0603
1997–2004	<i>Theory, reliability and mechanism of damage statically and dynamically stressed structures.</i> Project of the Czech Ministry of Education MSMT 261100007.
2000–2007	<i>SARA: Structural Analysis and Reliability Assessment</i> , International project of Brno University of Technology (Czech Republic), BOKU Vienna (Austria), Červenka Consulting Prague (Czech Republic), TU Vienna (Austria), and University Trento (Italy). Sponsored by Brenner Autobahn, Italy, member of team.
01/2003–03/2003	Grant of the German Science Foundation (DFG) in the framework of the <i>Collaborative Research Center 532</i> .
03/2004–04/2004	U.S. National Science Foundation under grant CMS-9713944 to Northwestern University NU (Prof. Z.P. Bažant)
2002–2004	<i>Nonlinear Fracture Mechanics of Concrete with Utilization of Stochastic Finite Elements and Random Fields.</i> Project of the Grant Agency of Czech republic GACR 103/02/1030
2004–2007	<i>Model identification and optimization at material and structural levels.</i> Project of the Grant Agency of Czech republic GACR 103/04/2092
2004–2007	VITESPO – <i>Virtual testing of structural safety and reliability.</i> Joint project of Červenka Consulting and Brno University of technology, Faculty of Civil Engineering. Sponsored by the Czech Academy of sciences under the project No. T409870411
09/2004–06/2007	<i>Statistical aspects of structural size effect.</i> Main investigator (“Key person”). University of technology, Faculty of Civil Engineering. Sponsored by the Czech Ministry of Education under the project No. 1K04110.
10/2004–10/2006	<i>Adaptive probabilistic modeling of localization, failure and size effect of quasi-brittle materials.</i> Aachen University of technology, RWTH. Sponsored by DFG, Germany.
01/2006–12/2008	<i>Probabilistic nonlinear finite element method with h-adaptivity.</i> Responsible investigator. Project of the Grant Agency of Czech republic GACR 103/06/P086. Project evaluated as “excellent”.
01/2006–12/2009	CIVAK– <i>Center for integrated design of progressive building structures.</i> (research center). Sponsored by the Czech Ministry of Education under project no. 1M6840770001.
01/2007–12/2007	FRVS 2164 (Type Aa): <i>Experimental laboratory of the Institute of Structural mechanics.</i> Capitation grant: 1 699 000 CZK Sponsored by the Czech Ministry of Education.
2007–2009	<i>Soft computing in structural mechanics.</i> Project of the Grant Agency of Czech republic GACR 103/07/0760.
2009–2011	<i>Rozvoj numerických metod analýzy problémů stochastické výpočtové mechaniky.</i> Responsible investigator. Project of the Grant Agency of the Academy of Sciences of the Czech Republic AVČR KJB201720902.
2009–2012	<i>Moderní kompozitní konstrukce.</i> Co-investigator. Project of the Czech Science Foundation GACR GD103/09/H085.
01/2008–12/2008	FRVS 2164 (Type Aa): <i>Výukové videosekvence doplňující výklad nelineární lomové mechaniky.</i> Co-investigator. Sponsored by the Czech Ministry of Education, Youth and Sports of the Czech Republic – FRVŠ 801/2008 (Type G1).

- 01/2010–12/2010 FRVS 2378/2010 (Type Aa): *Řešené úlohy z oblasti spolehlivosti stavebních konstrukcí*. Co-investigator. Sponsored by the Czech Ministry of Education, Youth and Sports of the Czech Republic – FRVŠ (Type G1).
- 2010–2012 *Vývoj a implementace výpočtové platformy pro simulaci kvazi-duktilních kompozitů kombinujících krátká vlákna se strukturovanou průběžnou výztuží*. Responsible investigator. International project. Project of the Czech Science Foundation GACR P105/10/J028.
- 2010–2012 *StruRel – Spolehlivost konstrukcí s použitím statistické mechaniky*. Responsible investigator. International project. Project of the Ministry of Education, Youth and Sports of the Czech Republic ME10030.
- 01/2012–12/2012 FRVS 1089/2012 (Type Aa): *Řešené numerické příklady do předmětu Pružnost a pevnost*. Co-investigator. Sponsored by the Czech Ministry of Education, Youth and Sports of the Czech Republic – FRVŠ (Type G1).
- 2012–2014 *StochFra – Stochastic discrete modeling of fracture processes in quasibrittle materials*. International project. Project of the Ministry of Education, Youth and Sports of the Czech Republic LH12062.

Student research competitions

- 1997 session Applied Physics: Thermal dependence measuring of modulus of elasticity of special structural materials using dynamic methods. (Awarded by 1st prize)
- 1998 session Structural Mechanics: Price optimization of deteriorated RC structure in time. (Awarded by 1st prize)
- 2000 in session Structural Mechanics: Application of reliability methods at monitoring of size effect on carrying capacity of concrete structures
- 2000 in session Structural Mechanics: Probabilistic nonlinear analysis of steel frames focused on reliability level according to Eurocodes. (Awarded by 1st prize)

Professional stays, visiting positions

- 04/2001 PhD course Elastic and Inelastic Analysis of Heterogeneous Materials. Certificate of Attendance from Czech university in Prague, Faculty of Civil Engineering, Department of Structural Mechanics
- 07/2001–08/2001 summer school (two-week course) Advanced Studies in Structural Engineering and CAE, 9th European Summer Academy 2001. Certificate of Attendance from Bauhaus University Weimar, Germany, Civil & Structural Engineering. Passed final oral examination with the mark A (ECTS Grade) and therefore credited with 7 ETCS credits
- 08/2001–09/2001 Professional 6-week training IAESTE, Croatia, Zagreb. The Dalekovod Company. Focus on Antennae towers, transmission lines (steel structures); Foundations of structures (concrete structures and soil mechanics)
- 01/2003–03/2003 Visiting research position in Aachen, Germany. Invited lectures. Cooperation on development of methodology and software for consideration of stochastic aspects in failures of Textile Reinforced Concrete
- 04/2003–05/2003 Visiting research position in Aachen, Germany. Invited lectures. Cooperation on development of methodology and software for consideration of stochastic aspects in failures of Textile Reinforced Concrete
- 06/2003–07/2003 Visiting research position at Prof. Z.P. Bazant: Northwestern University, Evanston, IL, USA
- 08/2003 Fulbright preacademic training, University of Philadelphia, USA
- 08/2003–04/2004 Visiting research position (Fulbright scholarship) at Prof. Z.P. Bazant: Northwestern University, Evanston, IL, USA (extension supported by NSF grants to Prof. Z.P. Bazant)

11/2004–04/2005	Research position in Aachen, Germany. Cooperation on development of methodology and software for consideration of stochastic aspects in failures of concrete structures.
since 2005	Research stays in Aachen, Germany, at least twice a year for at least one week. Cooperation on development of methodology and software for consideration of stochastic aspects in failures of concrete structures.

Related experience, positions

2001–2006	Faculty of Civil Engineering, Brno University of Technology, Czech republic. Researcher and Assistant professor.
since 2007	Faculty of Civil Engineering, Brno University of Technology, Czech republic. Researcher and Associate professor.
08/2004	JAPE projekt, Ltd. Structural design and computations. Consultant.
since 2001	IT Technologies: Software design and programming within the project SARA (reliability software FReET, see http://www.freet.cz).

Languages	Czech – native language, English and Slovak – speaks fluently and read/write with high proficiency, Russian – basics of language
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Interests	Music, Sport
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Scientometrics

H-index	<i>Scopus</i> database: 15 <i>Web of Science</i> : 15 <i>Google Scholar</i> : 23
Citations	<i>Scopus</i> database: 1000+ <i>Web of Science</i> : 820+ <i>Google Scholar</i> : 2000+

Brno, March, 2016