

CURRICULUM VITAE

last update: 6/8/2018

- Name and Degree:** doc. Mgr. Milan Krbálek, Ph.D.
- Birth:** 13th April 1971, Hlinsko, Czech Republic
- Grade:** Associate Professor
- Contact:** Private address: Pardubice – Zelené Předměstí, Czech Republic
Email: milan.krbalek@jfifi.cvut.cz
Web pages: www.krbalek.cz
Phone: (+420)224358550
- Affiliation:** Department of Mathematics
Faculty of Nuclear Sciences and Physical Engineering
Czech Technical University, Prague, Czech Republic
- Education:**
1994 – 1999 University of Hradec Králové, Master Degree
1999 – 2003 Faculty of Nuclear Sciences and Physical Engineering, Doctoral Degree
2011 Faculty of Nuclear Sciences and Physical Engineering, Associated Professor
- Scientific Status:**
2011 – present Country Representative of World Center of Traffic Research (WCTR)
- Scientific Group:**
2010 – present GAMS — Group of Applied Mathematics and Stochastics
- Scientific Fellowships:**
1999 – 2003 Institute of Economy and Traffic, Technical University of Dresden, Germany
1999 – present Max Planck Institute for Physics of Complex Systems, Dresden, Germany
2001 – present Joint Institute of Nuclear Research, Dubna, Russia
1999 – 2003 Institute of Physics, Czech Academy of Science, Czech Republic
1999 – present University of Hradec Králové, Czech Republic
2008 – present Université Paris-Sud 11, Paris, France

2005 – present

Brno University of Technology, Faculty of Civil Engineering, Czech Republic

2013 – present

Institute of Information Theory and Automation, Czech Republic

Research Topics:

Mathematical Modeling of Socio-Physical Dynamics

Vehicular Headway Modeling

Analytical Computations for Physics of Traffic

Numerical Models of Traffic Flows

Asymmetric Simple Exclusion Model

Merging, Weaving, and Intersection Capacities

Models for Pedestrian Flows

Models for Crowd Under the Panic Conditions

Theory of Balanced Distributions

Balanced Particle Systems

Random Matrix Theory

Scientific Evaluation:

Web of Science

236 (with self-citations, last update: 6/8/2018)

Web of Science

148 (without self-citations, last update: 6/8/2018)

H-index (Web of Science)

09 (with self-citations, last update: 6/8/2018)

Number of WOS Publications

27 (last update: 6/8/2018)

Top Project:

2015 – 2017

Detection of stochastic universalities in non-equilibrium states of socio-physical systems by means of Random Matrix Theory (supported by Czech Science Foundation GA ČR)

Scientific Collaborators:

Prof. RNDr. Petr Šeba, DrSc.

Random Matrix Theory, Theory of Chaos, Parking Problems,
New Aspects in Physics of Traffic

Prof. Cecile Appert-Rolland

Advanced Statistical Analysis of Traffic Data

Ing. Jiří Apeltauer, Ph.D.

Vehicular Headway Modeling, Merging, and Intersection Capacities

Prof. Dr. Dirk Helbing

Quantitative Sociodynamics, Physics of Traffic

Local Thermodynamical Gases

Prof. Vyaceslav Borisovic Priezhev

Generalizations of Asymmetric Simple Exclusion Model

Prof. Ingrid Rotter	Classical and Quantum Chaos
Dr. Peter Wagner	Physics of Traffic, Cellular Models
Ing. Pavel Hrabák, Ph.D.	TASEP & Models for Pedestrian Flows
Ing. Marek Bukáček	Pedestrian dynamics

Teaching Activities:

FNSPE, CTU Prague	Mathematical Analysis (Calculus), Equations of Mathematical Physics, Seminar on Calculus, Mathematical Modeling of Vehicular Systems, Random Matrix Theory in Applications, Mathematics for Particle Systems, Theory of Deterministic Chaos
University of Hradec Králové	Theoretical Physics, Theory of Electricity and Magnetism, Theory of Relativity, Mathematics for Physicists

Reviewed Articles in the Impacted Scientific Periodicals:

2018	M. Bukáček, P. Hrabák, and M. Krbálek <i>Microscopic Travel Time Analysis of Bottleneck Experiment</i> Transportmetrica A: Transport Science 14/5-6 (2018), 375
2018	M. Krbálek, J. Apeltauer, T. Apeltauer, and Z. Szabová <i>Three methods for estimating a range of vehicular interactions</i> Physica A 491 (2018), 112
2018	M. Krbálek, P. Hrabák, and M. Bukáček, <i>Pedestrian headways — Reflection of territorial social forces</i> Physica A 490 (2018), 38
2017	M. Krbálek <i>Quantitative analysis of interaction range in vehicular flows</i> Transportation Research Procedia 25 (2017), 1268
2016	M. Krbálek and P. Hrabák <i>Time-headway distribution for periodic totally asymmetric exclusion process with various updates</i> Physics Letters A 380/9-10 (2016), 1003
2016	M. Bukáček, P. Hrabák, and M. Krbálek <i>Individual Microscopic Results Of Bottleneck Experiments</i> Traffic and Granular Flow '15 (2016), 105

- 2015 M. Krbálek and J. Šleis
Vehicular headways on signalized intersections: theory, models, and reality
J. Phys. A: Math. Theor. **48** (2015), 015101
- 2014 M. Bukáček, P. Hrabák, and M. Krbálek
Experimental Study of Phase Transition in Pedestrian Flows
Transportation Research Procedia **2** (2014), 105
- 2014 M. Bukáček, P. Hrabák, and M. Krbálek
Cellular Model of Pedestrian Dynamics with Adaptive Time Span
Lecture Notes in Computer Science **7385** (2014), 669
- 2013 P. Hrabák, M. Bukáček, and M. Krbálek
Cellular Model of Room Evacuation Based on Occupancy and Movement Prediction: Comparison with Experimental Study
Journal of Cellular Automata **8** (2013), 383
- 2013 Milan Krbálek
Theoretical predictions for vehicular headways and their clusters
J. Phys. A: Math. Theor. **46** (2013), 4451011
- 2012 P. Hrabák, M. Bukáček, and M. Krbálek
Cellular Model of Room Evacuation Based on Occupancy and Movement Prediction
Lecture Notes in Computer Science **7495** (2012), 709
- 2011 M. Krbálek and P. Hrabák
Inter-particle gap distribution and spectral rigidity of totally asymmetric simple exclusion process with open boundaries
J. Phys. A: Math. Theor. **44** (2011), 175203
- 2011 M. Krbálek and K. Kittanová
Lattice thermodynamic model for vehicular congestions
Procedia Social and Behavioral Sciences **20** (2011), 398
- 2011 M. Krbálek and P. Hrabák
Distance- and time-headway distribution for totally asymmetric simple exclusion process
Procedia Social and Behavioral Sciences **20** (2011), 406
- 2010 M. Krbálek
Analytical derivation of time spectral rigidity for thermodynamic traffic gas
Kybernetika **46-6** (2010), 1108

- 2009 M. Krbálek and P. Šeba
Spectral rigidity of vehicular streams (Random Matrix Theory approach)
J. Phys. A: Math. Theor. **42** (2009), 345001
- 2008 M. Krbálek
Inter-vehicle gap statistics on signal-controlled crossroads
J. Phys. A: Math. Theor. **41** (2008), 205004
- 2007 M. Krbálek
Equilibrium distributions in a thermodynamical traffic gas
J. Phys. A: Math. Theor. **40** (2008), 5813
- 2005 M. Krbálek
Dopravní systémy jako termodynamické plyny
Československý časopis pro fyziku **5** (2005), 432
- 2004 M. Krbálek and D. Helbing
Determination of interaction potentials in freeway traffic from steady-state statistics
Physica A **333** (2004), 370
- 2003 M. Krbálek and P. Šeba
Headway statistics of public transport in Mexican cities
J. Phys. A: Math. Gen. **36** (2003), L1
- 2001 M. Krbálek, P. Šeba, and P. Wagner
Headways in the traffic flow - remarks from a physical perspective
Phys. Rev. E **64** (2001), 066119
- 2000 M. Krbálek and P. Šeba
Statistical properties of the city transport in Cuernavaca (Mexico) and random matrix ensembles
J. Phys. A: Math. Gen. **33** (2000), L229

Other Reviewed Articles, Thesis, and Papers:

- 2017 M. Krbálek, J. Apeltauer, and T. Apeltauer
Vliv třídy rozdělení časových odstupů na kapacitu neřízených křižovatek
Silnice Železnice **4** (2017), 90

- 2017 Milan Krbálek
Actively-Followed Vehicles
Proceedings of SPMS 2017, Dobřichovice 2017, ISBN 978-80-01-06338-5
- 2016 M. Krbálek, J. Apeltauer, and T. Apeltauer
Analýza mikrostruktury dopravního proudu s využitím standardních empirických dat
Silnice Železnice **5** (2016), 98
- 2015 M. Krbálek, J. Apeltauer, T. Apeltauer, and M. Všečeka
Analýza mikrostruktury dopravního proudu metodami teorie náhodných matic
Silnice Železnice **3** (2015), 30
- 2015 Milan Krbálek
Matematický siloměr na detekci sociálních interakcí
Rozhledy matematicko-fyzikální
Jednota českých matematiků a fyziků, 90/1-2 (2015), 30-38
- 2011 Milan Krbálek
Socio-physical modeling of traffic stream dynamics, Habilitation Thesis, FNSPE, Czech Technical University
- 2010 Milan Krbálek
Discrete thermodynamical modelling of traffic streams
Proceedings of World Conference on Transport Research 2010
Lisbon, Portugal
- 2010 Milan Krbálek
Time clearance distribution and associated spectral rigidity of thermodynamic traffic gas
Proceedings of Conference SPMS 2010, Děčín, Czech Republic
- 2007 Milan Krbálek
Dopravní systémy jako termodynamické plyny
Československý časopis pro fyziku **55** (2005), 432-435
- 2003 Milan Krbálek
Traffic systems - particle gases in thermal equilibrium (Random Matrix Theory approach), Doctoral Thesis
FNSPE, Czech Technical University

2000 Milan Krbálek and Petr Šeba
Description of the traffic systems by the random matrix theory
Proceedings of the Nostradamus 2000 Conference, Zlín, Czech Republic

Textbooks:

2017 Milan Krbálek
Funkce více proměnných
Česká technika - nakladatelství ČVUT, Praha 2017

2014 Milan Krbálek
Teorie míry a Lebesgueova integrálu
Česká technika - nakladatelství ČVUT, Praha 2014

2012 Milan Krbálek
Úlohy matematické fyziky
Česká technika - nakladatelství ČVUT, Praha 2012

2011 Milan Krbálek
Matematická analýza III (třetí rozšířené vydání)
Česká technika - nakladatelství ČVUT, Praha 2011

2010 Milan Krbálek
Matematická analýza IV – cvičení
Česká technika - nakladatelství ČVUT, Praha 2010

2009 Milan Krbálek
Matematická analýza IV (druhé rozšířené vydání)
Česká technika - nakladatelství ČVUT, Praha 2009

2008

Milan Krbálek

Úlohy matematické fyziky - cvičení

Česká technika - nakladatelství ČVUT, Praha 2008

Commercial Interview:

DVTV (with Emma Smetana): Brain as the main cause of vehicular platoons, and BBC: Buses on Quantum Schedules

Popular Articles:

The Times (London), Discovery (USA), Science News (Washington), MF Dnes (Czech Republic), Quanta Magazine (New York)

Personal Interests:

Running, Hiking, Cycling, Photography Taking, and Music, Caribbean Rums, Graphical Design, and Takamine – Santa Fè & Shure 55 SH-II & TC Helicon VoiceTone Create XT, Canon 6D, Objectiv Canon EF 50mm f/1.2 L USM, Objectiv Canon EF 70–200mm f/2.8 L IS USM II, Objectiv Canon EF 100mm f/2.8L Macro IS USM, Objectiv Canon EF 24–70mm f/2.8 L USM II, Polarizing Filters HOYA 67mm/72mm/77mm/82mm HD, Polarizing Filter B+W ND 1000× F-Pro MRC 67mm