Curriculum Vitae

Name: Patrícia Martinková

Address: Department of Statistical Modelling
Institute of Computer Science of the Czech Academy of Sciences
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ORCID ID: 0000-0003-4754-8543
Researcher ID: E-5090-2014
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Education:
Charles University in Prague, Czech Republic
2003 – 2007 Ph.D. in Probability and Mathematical Statistics.
                Reliability of composite dichotomous measurements.
1998 – 2003 MSc. in Probability, Mathematical Statistics and Econometry

Professional Experience:
Since 2008   *Researcher* at Institute of Computer Science, Czech Academy of Sciences (CAS), currently *vice-head* of the Department of the Statistical Modelling

Since 2016   *Affiliate Assistant Professor*, Dept. of Statistics, University of Washington

Since 2017   *Research scientist* at Institute for Research and Development of Education, College of Education, Charles University, Prague

2013 – 2015 *Visiting research scholar* at Dept. of Statistics and Center for Statistics and the Social Sciences, University of Washington

2007 – 2008 *Junior Scientist* at Center for Biomedical Informatics, CAS

2001 – 2006 *Research Assistant* at Institute of Computer Science, CAS

Awards:
2017   Primus, Charles University, Prague
2014   Junior grant, Czech Science Foundation
2014   Outreach Lecturing Fund (OLF) Award, CIES
2013   Fulbright-Masaryk Fellowship
2013   Best Poster Award, Psychometric Society, IMPS 2013, Arnhem, NL
2013   Travel Award, Czech Statistical Society
2011   Otto Wichterle Award, Czech Academy of Sciences

Current Research Projects:
2015 – 17 **Estimation of psychometric measures as part of admission test development**
Junior researcher project funded by Czech Science Foundation. Project explores up-to-date and novel psychometric tools for analysis and improvement of admission process. (Principal Investigator)

2016 - 18 **CLoSE: Czech Longitudinal Study in Education**
Czech Science Foundation, Center of Excellence. Project explores school value added and impact of early tracking in Czech education system. (Team member)

Selected publications:

Drabinová A, **Martinková P.** Detection of Differential Item Functioning with Nonlinear Regression: Non-IRT Approach Accounting for Guessing. *Journal of Educational Measurement,* Vol. 54, no. 4, pp. 498-517, 2017.

Martinková P, Drabinová A, Liaw Y-L, Sanders EA, McFarland JL, Price RM. Checking equity: Why DIF analysis should be a routine part of developing conceptual assessments. *CBE Life Sciences Education*, Vol. 16 no. 2 rm2, 2017.

McFarland JL, Price RM, Wenderoth MP, **Martinková P**, Cliff W, Michael J, Modell H and Wright A. Development and Validation of the Homeostasis Concept Inventory. *CBE Life Sciences Education*, Vol. 16 no. 2 ar35, 2017.

Michael J, **Martinková P**, McFarland JL, Wright A, Cliff W, Modell H, Wenderoth MP. Validating a conceptual framework for the core concept of "cell-cell communications". *Advances in Physiology Education*, Vol. 41 no. 2, pp. 260-265, 2017.

Martinková P, Drabinová A, Houdek, J. ShinyItemAnalysis: Analyzing admission and other educational and psychological test. (In Czech) *Testfórum*, no. 9, pp.16-35, 2017.

Martinková P, Štěpánek L, Drabinová A, Houdek Jakub, Vejražka M, Štuka Č. Semi-real-time analyses of item characteristics for medical school admission tests. In Ganzha, M.; Maciaszek, L.; Paprzycki, M. (ed.). *Proceedings of the 2017 Federated Conference on Computer Science and Information Systems.* Warszawa: Polish Information Processing Society, 2017, pp. 289-294. *Annals of Computer Science and Information Systems*, 11. ISBN 978-83-946253-7-5. ISSN 2300-5963.

Řasová K, Freeman J, **Martinková P**. et al. The Organisation of Physical Therapy for People with Multiple Sclerosis across Europe: A Multicentre Questionnaire Survey. *BMC Health Serv Res, 2016, 16(1).*

Martinková P, Goldhaber D. Improving Teacher Selection: The Effect of Inter-Rater Reliability in the Screening Process. *CEDR working paper 2015-7.* University of Washington.

Řasová K, **Martinková P**, et al. Physical therapy provision in multiple sclerosis across Europe: a regional lottery? *European Journal of Physical and Rehabilitation Medicine,* 2015, 51(6), pp. 850-852.

Martinková P, Vlčková K. Estimation of reliability of educational and psychological measurements. [In Czech] *Bulletin of Czech Statistical Society,* 25(4), pp. 1-15, 2014.

Řasová K, **Martinková P**, et al. Physical therapy in multiple sclerosis differs across Europe – Information regarding an ongoing study. *The Journal of International Medical Research,* 42(5), pp. 1185-87, 2014.

Štuka Č, **Martinková P**, Vejražka M, Trnka J, Komenda M. *Student Assessment in Medical Education: Construction and Analysis of Tests at Medical Schools.* [Book in Czech, 156 p.] Prague: Karolinum, 2013.

Řasová K, **Martinková P**, Vyskotová J, Šedová M. Assessment set for evaluation of clinical outcomes in multiple sclerosis - psychometric properties. *Patient Related Outcome Measures*, 3, pp. 59-70, 2012.

Štuka Č, **Martinková P**, Zvára K, Zvárová J. The prediction and probability for successful completion in medical study based on admission test and pre-admission grades. *The New Educational Review,* 28(2), pp. 138-152, 2012.

Řasová K, Kalistová H, Kučera P, Juzová O, Zimová D, Medová E, Doležil D, Jandová D, Tintěra J, Ibrahim I, Zvára K, Bičíková M, **Martinková P.** Physiotherapy as an immunoactive therapy? A pilot study. *Neuroendocrinology Letters*, 33(1), pp. 67-75, 2012.

Ibrahim I, Tintěra J, Škoch A, Jírů F, Hluštík P, **Martinková P**, Zvára K, Řasová K. Fractional anisotropy and mean diffusivity in the corpus callosum of patients with multiple sclerosis: the effect of physiotherapy. *Neuroradiology*, 53(11), pp. 917-26, 2011.

Martinková P, Zvára K. Reliability of Composite Dichotomous Measurements. *European Journal for Biomedical Informatics*, 6(2), pp. 14-23, 2010.

Řasová K, Brandejský P, Tintěra J, Krásenský J, Zimová D, Medová E, Herbenová A, Kalistová H, Jech R, Řasová M, Zemanová P, Zeman J, Ibrahim I, **Martinková P**, Doležil D, Jandová D. Bimanual Tandem Motor Task with Multiple Sclerosis in Functional Magnetic Resonance Imaging: Effect of Physiotherapeutic Techniques - a Pilot Study (In Czech). *Česká a Slovenská neurologie a neurochirurgie,* 72(4), pp. 350-358, 2009.

Martinková P, Zvára K. Reliability in the Rasch Model. *Kybernetika*, 43(3), pp. 315-26, 2007.

Martinková P, Zvára jr. K, Zvárová J, Zvára K. The New Features of the Exame Evaluation System and Reliability of Its Fixed Tests. *Methods of Information in Medicine*, 45(2), pp. 310-315, 2006.

Řasová K, Havrdová E, Brandejský P, Zálišová M, Foubíková B, **Martinková P.** Comparison of the Influence of Different Rehabilitation Programmes on Clinical, Spirometric and Spiroergometric Parameters in Patients with Multiple Sclerosis. *Multiple Sclerosis*, 12(2), pp. 227-234, 2006.

Řasová K, Krásenský J, Havrdová E, Obenberger J, Seidel Z, Doležal O, **Rexová P**, Zálišová M. Is it Possible to Actively and Purposely make use of Plasticity and Adaptibility in the Neurorehabilitation Treatment of Multiple Sclerosis Patients? A Pilot Project. *Clinical Rehabilitation*, 19(2), pp. 170-181, 2005.

Vášková M, Mejstříková E, Kalina T, **Martinková P**, Omelka M, Trka J, Starý J, Hrušák O. Transfer of Genomics Information to Flow Cytometry: Expression of CD27 and CD44 Discriminates Subtypes of Acute Lymphoblastic Leukemia. *Leukemia*, 19(5), pp. 876-878, 2005.

Software:

Martinková P, Drabinová A, Leder O, Houdek J. ShinyItemAnalysis: Test and Item Analysis via Shiny. R package Version 1.2.3. CRAN, 2017.
Online version: https://shiny.cs.cas.cz/ShinyItemAnalysis/

Drabinová A, **Martinková P**, Zvára K. difNLR: Detection of Dichotomous Differential Item Functioning (DIF) by Non-Linear Regression Function. R package Version 1.1.1. CRAN, 2016.

Selected presentations:

Martinková P, Drabinová A, Houdek J, Leder O, Štěpánek L. Teaching Psychometrics and Analyzing Educational Tests with ShinyItemAnalysis. useR!2017, Brussels. Abstract and presentation: https://user2017.sched.com/event/AxsE
Video: https://channel9.msdn.com/Events/useR-international-R-User-conferences/useR-International-R-User-2017-Conference/Teaching-psychometrics-and-analysing-educational-tests-with-ShinyItemAnalysis

Martinková P, Drabinová A. Detection of DIF Based on Non-IRT Generalized Regression Approaches. IMPS 2017, Zurich.

Martinková P, Drabinová A, Houdek J. Interactive and Step by Step Analyses of Test and Item Properties with "difNLR" and "ShinyItemAnalysis". Psychoco – International Workshop on Psychometric Computing 2017, Vienna.

Martinková P, Drabinová A, Leder O. Detection of Differential Item Functioning with difNLR Function. useR! 2016, Stanford University.

Martinková P, Goldhaber D. Mixed-Effect Models for Assessing Interrater Reliability and Its Moderators. IMPS 2016, Asheville.

Drabinová A, **Martinková P.** Detection of Differential Item Functioning Based on Non-Linear Regression. IMPS 2016, Asheville. Travel award for A. Drabinová.

Martinková P, Goldhaber D. Hierarchical Models for Assessing Reliability in Teacher Hiring. JSM, Seattle, Aug 2015.

Martinková P, Goldhaber D. Improving Teacher Selection: Effect of Inter-rater and Intra-rater Reliability in Screening Process. AEFP, Washington D.C., Feb 2015.

Martinková P. Researching Reliability Estimates in the Context of Czech Admission Tests. Presented as part of OLF travel award at BEAR seminar, UC Berkeley (host Karen Draney), CRESST UCLA (host Li Cai), UC Merced (host William Shadish), Feb 2014.

Martinková P, Turčičová M. Generalized Reliability Used for the Comparison of Reliability Estimates in Tests with Binary Items. Presented at IMPS 2013, Arnhem, Netherlands. Best poster award.

Řasová K, **Martinková P,** Henze, T. Towards an Inventory of the Content of Physical Rehabilitation in Europe. *Lifelong Perspective: Rehabilitation for MS Patients with Complex Needs,* University of Turku, pp. 24, 2011. Presented at RIMS 2011, Turku, Finland.

Martinková P, Šedová M, Řasová K. Reliability of clinical functioning measures in patients with multiple sclerosis. *30th Annual Conference of the International Society for Clinical Biostatistics*, pp. 147, 2009. Presented at ISCB 2009, Prague, Czech Republic.

Martinková P, Zvára K. Reliability of Composite Dichotomous Measurements. *29th Annual Conference of the International Society for Clinical Biostatistics*, pp. 93, 2008. Presented at ISCB 2008, Copenhagen, Denmark.

Šedová M, **Martinková P**, Gabalec L. Assessment and comparison of two questionnaires of quality of life in Crohn's disease patients. *Lifestat 2008. Statistics and Life Sciences: Perspective and Challenges*, pp.224. Presented at Lifestat, 2008, Munich, Germany.

Grants Awarded:
- 2017 PRIMUS, Charles University, "Center for Educational Measurement and Psychometrics" (PI)
- 2016 *Let's speak together,* T-mobile grant for nonprofit organizations, "Together for the kids and the neighborhood" (PTA Spolek Parkán)
- 2014 Junior researcher grant, Czech Science Foundation, "Estimation of psychometric measures as part of admission test development" (PI)
- 2013 Fulbright-Masaryk Fellowship "Generalizing psychometric frameworks for estimating quality of psychological, educational and health measurement"

Teaching:
Autumn 2017 NMST 570 **Selected Topics in Psychometrics.** Charles University, Prague.
Spring 2017 B00364 **Introduction to Biostatistics.** Charles University, Prague.
Winter 2015 EDPSY 595 **Item Response Theory.** University of Washington. Syllabus.
Spring 2015 STAT/CS&SS/SOC 221 **Statistical Concepts and Methods for the Social Sciences.** University of Washington. Syllabus.
2002 – 2013 **Statistics in Medical Research.** EuroMISE Centre, Czech Republic.
2004 **Statistics for the Social Sciences.** University of J. E. Purkyne, Czech Republic
2004 **Biostatistics.** TA, School of Natural Sciences, Charles University in Prague.

Guest lectures:
2013 **Seminar in longitudinal data analysis.** University of Washington. R lab on longitudinal data analysis.
2014 **Introduction to R for Social Scientists.** University of Washington. R lab on sampling and probability distribution calculations.

Supervised Students:
- Katarína Vlčková: Test and Item Fairness (supervisor, M.Sc., Mathematical Statistics, Charles University, Prague, received 2015)
- Martin Komarc: Computerized Adaptive Testing (committee member / reviewer, Ph.D., Kinanthropology, Charles University, Prague, received 2017)
- Dominik Tělupil: Computerized Adaptive Testing (supervisor, M.Sc., Mathematical Statistics, Charles University, Prague, expected 2018)
- Adéla Drabinová: Statistical Models in Psychometrics (supervisor, Ph.D., Mathematical Statistics, Charles University, Prague, expected 2020)

Community Service - Professional:
- Reviewer for Applied Psychological Measurement, CBE-Lifesciences, Pedagogika, Orbis Scholae, Methods of Information in Medicine
- Reviewer for submissions for ECER conference, Poster reviewer for IMPS conference
- Reviewer for grant proposals of Czech Academy of Sciences (international projects DAAD, MOST, and other)
- Member of Council for Foreign Relations of the Czech Academy of Sciences
- MC Member of COST Action "New Frontiers of Peer Review" (www.peere.org)

Community Service - Other:
- ELL representative, Sand Point Elementary PTA, 2013-2014
- President of parent teacher association Spolek Parkán, since 2016

Current Memberships:
Psychometric Society (since 2016), International Society for Clinical Biostatistics (since 2007), Czech Statistical Society (since 2001)