

Curriculum Vitae

Niklas Ignasiak (formerly König)

BSc. PT, MSc., PhD

Contact Information

Chapman University
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Education

PhD	
Institute for Biomechanics, ETH Zurich, Switzerland	2013-2017
Master of Science	
Clinical Exercise Science, University of Potsdam, Germany	2010-2012
Bachelor of Science	
Physiotherapy, Alice Salomon University of Applied Sciences, Berlin, Germany	2007-2009
Physiotherapy (vocational training)	
School for Physiotherapy, Charité – University Hospital Berlin, Germany	2005-2008

Employment and positions

Assistant Professor (tenure-track)	
Department of Physical Therapy, Chapman University, USA	2018-present
Research Fellow	
Laboratory of Engineering of Neuromuscular System, Politecnico Torino, Italy	2015
Research Fellow	
Institute for Biomedical Research, Novartis, Switzerland	2013
Research Assistant	
Julius Wolff Institute, Charité – University Hospital Berlin, Germany	2009-2012
Physiotherapist	
Physiotherapie Südwest, Germany	2009-2010

Research interest

My research focus lies in the evaluation of walking function and the underlying neurophysiological control principles in patients with various neuromuscular disorders and healthy persons. In particular, I am interested to identify gait characteristics that determine the quality of a walking pattern. In this context, I aim to develop a comprehensive gait assessment tool and multidimensional map of walking pathology, in order to complement clinical evaluation of disease progression and treatment efficacy.

Peer reviewed publications (* indicates student co-author)

- 1) **N. König Ignasiak**, S. Orter*, H.S. Hosseini Nasab, W.R. Taylor, N.B. Singh (in preparation). The association between variability of footfall kinematics and dynamic stability of the center of mass during walking.
- 2) S. Orter*, D.K. Ravi*, N.B. Singh, F. Vogl, W.R. Taylor, **N. König Ignasiak** (submitted). A method to concatenate multiple shorter time series for evaluating dynamic behavior during walking.
- 3) **N. König Ignasiak**, L. Habermacher*, W.R. Taylor, N.B. Singh (2017). Cortical contribution to linear, non-linear and frequency components of motor variability control during standing. *Frontiers in Human Neuroscience*, 11: 548.
- 4) **N. König**, M.G. Ferraro*, H. Baur, W.R. Taylor, N.B. Singh (2017). What is the contribution of Ia-afference for regulating motor output variability during standing? *Frontiers in Human Neuroscience*, 11: 87.
- 5) **N. König**, N.B. Singh, C.R. Baumann, W.R. Taylor (2016). Can gait signatures provide quantitative measures for aiding clinical decision making? A systematic meta-analysis of gait variability behaviour in patients with Parkinson's disease. *Frontiers in Human Neuroscience*, 10: 319.
- 6) **N. König**, W.R. Taylor, C.R. Baumann, N. Wenderoth, N.B. Singh (2016). Revealing the quality of movement: A meta-analysis review to quantify the thresholds to pathological variability during standing and walking. *Neuroscience and Biobehavioral Reviews*, 68: 111.
- 7) K. Intziegianni, M. Cassel, **N. König**, S. Müller, K. Fröhlich, F. Mayer (2015). Ultrasonography for assessment of the structural properties of the Achilles tendon in asymptomatic individuals: An intra-rater reproducibility study. *Isokinetics and Exercise Science*, 23 (4).
- 8) **N. König**, N.B. Singh, G. Armbrecht, R. Dietzel, W.R. Taylor (2014). Identification of functional parameters for the classification of older female fallers and prediction of "first-time" fallers. *Royal Society Interface*, 11 (97).
- 9) **N. König**, M. Cassel, K. Intziegianni, F. Mayer (2014). Inter-rater Reliability and Measurement Error of Sonographic Muscle Architecture Assessments. *Journal of Ultrasound in Medicine*, 33 (5).
- 10) **N. König**, N.B. Singh, J. von Beckerath, L. Janke, W.R. Taylor (2014). Is gait variability reliable? An assessment of spatio-temporal parameters of gait variability during continuous overground walking. *Gait & Posture*, 39 (1).
- 11) N.B. Singh, **N. König**, A. Arampatzis, W.R. Taylor (2013). Age-related Modifications to the Magnitude and Periodicity of Neuromuscular Noise. *PLoS One*, 8 (12).

- 12) **N. König**, A. Reschke, M. Wolter, S. Müller, F. Mayer, H. Baur (2013). Plantar pressure trigger for reliable nerve stimulus application during dynamic H-reflex measurements. *Gait & Posture*, 37 (4).
- 13) N.B. Singh, **N. König**, A. Arampatzis, M.O. Heller, W.R. Taylor (2012). Extreme levels of noise constitute a key neuromuscular deficit in the elderly. *PLoS One*, 7 (11).

Peer reviewed scientific presentations

- 1) D.K. Ravi, **N. Ignasiak**, W.R. Taylor, C.R. Baumann, M. Uhl, M. Gwerder, N. Adam, N.B. Singh. Complementing clinical decision-making with gait signatures: Identifying the effectiveness of Deep Brain Stimulation (DBS) therapy. WCB 2018, Dublin (podium)
- 2) D.K. Ravi, W.R. Taylor, **N. Ignasiak**, L.O. Rong, G.J. Vivar, R. Brunner, N.B. Singh. Is inter-cycle walking variability rich in context? Developing a conceptual model to discriminate neuromotor skill adaptation from neuromotor deficits. WCB 2018, Dublin (poster)
- 3) D.K. Ravi, W.R. Taylor, **N. König**, N.B. Singh. A probabilistic approach for estimating uncertainty in optimal gait performance. ISB 2017, Brisbane (podium)
- 4) S. Orter, N.B. Singh, F. Vogl, J. Oberzaucher, W.R. Taylor, **N. König**. Where to connect? A method to concatenate multiple shorter time series in order to enhance external validity for evaluating dynamic behavior during walking. ISB 2017, Brisbane (podium)
- 5) N.B. Singh, F. Riner, **N. König**, W.R. Taylor. Can auditory stochastic resonance enhance standing balance? ISB 2017, Brisbane (podium)
- 6) **N. König**, N.B. Singh, W.R. Taylor. Can “quality of walking” be accurately assessed? Inter-cycle variations during walking are discretely regulated in patients with Parkinson’s disease. ESMAC 2016, Sevilla (podium)
- 7) **N. König**, M.G. Ferraro, H. Baur, N.B. Singh, W.R. Taylor. Influences of peripheral sensory information on the control of variability that is suitable for task performance. ESMAC 2016, Sevilla (podium)
- 8) **N. König**, N.B. Singh, M. Gazzoni, N. Wenderoth, W.R. Taylor. High-density SEMG for optimization of motor evoked potential detection on tibialis anterior muscle during transcranial magnetic stimulation. ISB 2015, Glasgow (poster)
- 9) S. Niederer, W.R. Taylor, P. Koopmans, **N. König**, N.B. Singh. Effects of physical fatigue caused by running as well as squatting exercise on variability during walking. ESB 2015, Prague (poster)
- 10) **N. König**, N.B. Singh, W.R. Taylor. Gait variability for quantification of the human sensorimotor system. Winter Symposium 2015, Munich (podium)
- 11) N.B. Singh, **N. König**, A. Arampatzis, M. Gazzoni, W.R. Taylor. Age- and fatigue-related modifications to the magnitude and periodicity of neuromuscular noise. WBC 2014, Boston (poster)
- 12) J. Goldhahn, **N. König**. Falls as outcome in clinical trials. Winter Symposium 2014, Munich (podium)
- 13) **N. König**, N.B. Singh, S. Bierbaum, W.R. Taylor. Functional parameters for the identification of future fallers. ESB 2013, Patras (podium)
- 14) N.B. Singh, **N. König**, J. von Beckerath, L. Janke, W.R. Taylor. Is gait variability reliable? ESB 2013, Patras (poster)
- 15) K. Intziagianni, M. Cassle, **N. König**, F. Mayer. Reliability of variables defining mechanical and material properties of the Achilles tendon. ACSM 2013, Indianapolis (poster)
- 16) M. Wochatz, M. Cassel, **N. König**, K. Froehlich, F. Mayer. Intra- and inter-observer variability of retrospective analysis of Achilles tendon ultrasound scans. ACSM 2013, Indianapolis (poster)

- 17) M. Wochatz, M. Cassel, **N. König**, K. Froehlich, F. Mayer. Inter-rater Variability of sonographic Cross-Sectional-Area in Achilles tendons. EFOST 2012, London (poster)
- 18) N.B. Singh, **N. König**, A. Arampatzis, M.O. Heller, W.R. Taylor. Fluctuations during force production play a direct role in the quality of task performance. ESB 2012, Lisbon (podium)
- 19) N.B. Singh, D. Hamacher, **N. König**, M.O. Heller, W.R. Taylor. Identifying fall prone elderly individuals in a clinical setting. ESB 2012, Lisbon (podium)
- 20) N.B. Singh, **N. König**, M.O. Heller, W.R. Taylor. Understanding pathological gait: A holistic approach applied to Parkinson's Disease. ESB 2012, Lisbon (podium)
- 21) D. Hamacher, C. Grabau, N.B. Singh, L. Schega, **N. König**, W.R. Taylor. Gait variability as a representation of the functionality of the sensorimotor system. ECSS 2012 Bruges (poster)
- 22) **N. König**, A. Stoll, F. Mayer, H. Baur. Intrasection reliability of insole in-shoe plantar pressure measurements in different foot areas. ACSM 2012, San Francisco (poster)
- 23) A. Reschke, M. Wolter, M. Schöpflin, **N. König**, F. Mayer, H. Baur. The effect of foot orthoses on peroneal H-reflex in treadmill walking. A pilot study. ACSM 2012, San Francisco (poster)
- 24) **N. König**, A. Reschke, M. Wolter, S. Müller, F. Mayer, H. Baur. Intersession reliability of H-reflex measurements in treadmill walking. EFSMA 2011, Salzburg (poster)
- 25) N.B. Singh, M.O. Heller, **N. König**, A. Arampatzis, W.R. Taylor. Towards understanding of subject specific risk of falling. IUTAM 2010, Leuven (podium)
- 26) N. B. Singh, A. Arampatzis, **N. König**, G. Duda, M.O. Heller, W.R. Taylor. Force fluctuations in knee extensors: Effect of fatigue and aging. DVS 2010, Hamburg (podium)

Awards

- 1) Finalist (last 4) Best Doctoral Thesis of the European Society of Biomechanics. WCB 2018, Dublin.
- 2) Best poster presentation (3rd place). AMGEN Scholars Europe Symposium. Oxford, 2015
- 3) Mobility award of the European Society of Biomechanics. WBC 2014, Boston
- 4) Travel award. Congress of the European Society of Biomechanics. ESB 2013, Patras
- 5) Best poster presentation. Annual Symposium of Applied Exercise Science, CES 2012, Potsdam

Ad-hoc reviewing

Gait and Posture

Clinical Biomechanics

Experimental Brain Research

Research in Developmental Disabilities

Teaching responsibilities

Chapman University

PT 539 Physical Agents, Co-Instructor

2018-present

PT 651 Scientific Inquiry II, Instructor	2018-present
PT 752 Scientific Inquiry III, Instructor	2018-present
PT 643 Motor control and Motor learning, Co-Instructor	2018-present

ETH Zurich

376-1660-00L Writing, Reporting and Communication, Teaching assistant	2013-2017
376-0203-AAL Movement and Sport Biomechanics, Teaching assistant	2015-2017