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Advanced technologies to assess motor dysfunction in children with cerebral palsy

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Curriculum Vitae and Publication list

Lizeth H. Sloot was born in The Netherlands on February 15, 1987. In 2005, she graduated as top of her class from high school (gymnasium) with a science profile (Natuur & techniek) enriched with Latin, economics and philosophy. She finished her bachelor on Medical Natural Sciences at the VU University in Amsterdam in 2008 with a thesis on the structural organization of the collagen coating on polyacrylamide gels. Subsequently, she obtained her Master of Science degree cum laude in Medical Natural Sciences with a specialization in Medical Physics in 2011. As part of her program, she studied the detection of impending loss of balance in gait and worked on a project on arm movements after tripping, both at the Faculty of Human Movement Sciences at the VU University. Her master's graduation project was performed at the Dutch Institute for Neuroscience in Amsterdam where she studied the relation between sleep and waking brain activity. In September 2011, Lizeth started as a PhD candidate at the department of rehabilitation medicine at the VU University Medical Center, collaborating in the ROBIN project with the faculty of mechanical engineering at the Delft University of Technology, and the departments of rehabilitation medicine and science at the Leiden University Medical Center and KU Leuven (Belgium). Most of her work is assembled in this thesis.

Lizeth had the opportunity to visit numerous conferences to present the results of her research. This resulted in several nominations and awards:

- Best Methodological Paper, published in *Gait & Posture*, ESMAC 2014
- *Nominated for* Best Paper Award, ESMAC Annual Meeting 2015
- *Nominated for* Best Young Scientist at the International NNR Meeting 2015
- *Runner up* Best Speaker Award, VUmc Science Exchange Day 2015
- *Runner up* Best Paper Award, MOVE Research Institute Meeting 2016
- International travel grant, ISB Annual Meeting 2015
- International travel grant, ESMAC Annual Meeting 2015
- KNAW Ter Meulen personal grant for a post-doc at Harvard University

During high school, her interest in policy was awakened by the opportunity to participate in simulations of the European parliament, being a representative in and organizer of regional to international sessions. During her university studies, she actively participated in her study's student association, where she held the positions of president and ad interim chair of the symposium committee. In addition, Lizeth was involved in student participation as student member of the education committee as well as elected member and vice-president of both the faculty's and university's student council. Subsequently, she served an advisory role for the Employee Council of the VU University Medical Center during her PhD project (2012-2015).

As a continuation of her research, she will be working at the WYSS Institute of Harvard University, to examine the ability of a soft-robotic exosuit to restore mobility in patients with an upper motor neuron syndrome.

List of Journal Publications

1. LD Aarts, J Harlaar, JC van den Noort, LH Sloot and SM Bruijn. The gait sensitivity norm as a measure of human gait stability (submitted)
2. JC van der Noort, LH Sloot, SM Bruijn and J Harlaar. A measure of knee (in) stability during gait in response to lateral perturbations (submitted)
3. LH Sloot, L Bar-On, MM van der Krogt, AI Buizer, JG Becher, E de Vlugt, K Desloovere and J Harlaar. Motor-driven versus manual instrumented spasticity assessment in children with cerebral palsy (submitted)
4. LH Sloot, H Houdijk and J Harlaar. Optimal calibration of instrumented treadmills using an instrumented pole (submitted)
5. LH Sloot, JC van den Noort, MM van der Krogt, SM Bruijn and J Harlaar (2015). Can treadmill perturbations evoke stretch reflexes in the calf muscles? *PLoS ONE* 10(12): e0144815. doi:10.1371/journal.pone.0144815
6. MM van der Krogt, LH Sloot, AI Buizer and J Harlaar (2015). Kinetic comparison of walking on a treadmill versus over ground in children with cerebral palsy. *Journal of biomechanics*, 48(13), 3577-3583

7. LH Sloot, J Harlaar and MM van der Krogt (2015). Self-paced versus fixed speed walking and the effect of virtual reality in children with cerebral palsy. *Gait & posture*, 42(4), 498-504.
8. LH Sloot, MM van der Krogt, KL de Gooijer-van de Groep, S van Eesbeek, J de Groot, AI Buizer, C Meskers, JG Becher, E de Vlucht and J Harlaar (2015). The validity and reliability of modelled neural and tissue properties of the ankle muscles in children with cerebral palsy. *Gait Posture* 42: 7-15
9. LH Sloot, H Houdijk and J Harlaar (2015) A comprehensive protocol to test instrumented treadmills. *Medical Engineering & Physics* 37(6):610-616
10. LH Sloot, MM van der Krogt and J Harlaar (2014) Energy exchange between subject and belt during treadmill walking. *J Biomech* 47: 1510-1513
11. MM van der Krogt, LH Sloot and J Harlaar (2014) Overground versus self-paced treadmill walking in a virtual environment in children with cerebral palsy. *Gait Posture* 40: 587-593
12. LH Sloot, MM van der Krogt and J Harlaar (2014) Effects of adding a virtual reality environment to different modes of treadmill walking. *Gait Posture* 39: 939-945
13. LH Sloot, MM van der Krogt and J Harlaar (2014) Self-paced versus fixed speed treadmill walking. *Gait Posture* 39: 478-484
14. LH Sloot, KS van Schooten, SM Bruijn, H Kingma and JH van Dieën (2011) Sensitivity of local dynamic stability of over-ground walking to balance impairment due to galvanic vestibular stimulation. *Ann Biomed Eng* 39(5): 1563-1569
15. KS van Schooten, LH Sloot, SM Bruijn, H Kingma, OG Meijer, M Pijnappels and JH van Dieën (2011) Sensitivity of trunk variability and stability measures to balance impairments induced by Galvanic Vestibular Stimulation during gait. *Gait Posture* 33(4): 656-660

Book chapters

1. BA Diaz, LH Sloot, HD Mansvelder, K Linkenkaer-Hansen (2012) EEG-Bio-feedback as a tool to modulate arousal: Trends and perspectives for treatment of ADHD and Insomnia. Published as Chapter 22 for “Neuroimaging – Cognitive and Clinical Neurosciences”, edited by P. bright, ISBN 978-953-51-0606-7

Selection of conference abstracts

1. M Piening, LH Sloot, JG Becher and J Harlaar. Repeatability and treatment sensitivity of the repetitive movement test in children with spastic cerebral palsy. ESMAC 2015 Heidelberg, *Gait & Posture*, 42, S41
2. LH Sloot, MM van der Krogt, E de Vlucht and J Harlaar. Objectively assessed spasticity of the calf versus impeding muscle activity during gait in spastic cerebral palsy. ESMAC 2014 Rome

3. M Pijnappels, I Kingma, LH Sloot, MJP Toebes and JH van Dieën. Do arm movements after tripping prevent or cause falls in older adults? ISPGR 2013 Akita Japan
4. M Pijnappels, I Kingma, LH Sloot & JH. van Dieën. Armed against falls; arm movements after tripping in young and older adults. WCB5 2010 Singapore.