Virtual reality based kinematics for assessment of post-stroke upper limb function

Stroke is one of the leading causes of disability around the world and arm impairment is one of the common problems experienced by individuals after stroke. The focus of this thesis was on validating a method for measuring the arm function of people with stroke. Virtual reality and haptic technology were used to generate kinematic variables for measuring the arm function after stroke. The discriminative validity of kinematic variables for various levels of arm impairment and healthy controls was demonstrated. The concurrent validity of kinematic variables against traditional clinical scales was established. The recovery of arm performance in terms of improvement of kinematic variables was shown, and the factors affecting this recovery were determined. The relationship between self-reported manual ability and kinematic variables was established. The knowledge from this thesis is useful in movement analysis research, especially in the development of new virtual reality based devices for assessment of arm function after stroke.

ISBN 978-91-7833-826-9 (PRINT)
ISBN 978-91-7833-827-6 (PDF)
http://hdl.handle.net/2077/63288

Printed by Stema Specialtryck AB, Borås

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2020

DOCTORAL
THESIS
SAHLGRENSKA
ACADEMY

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Netha Hussain

SAHLGRENSKA ACADEMY
INSTITUTE OF NEUROSCIENCE AND PHYSIOLOGY

UNIVERSITY OF
GOTHENBURG