

The Human Nociceptive Withdrawal Reflex

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Description:

The work presented in this PhD thesis is the result of research carried out at the Center for Sensory-Motor interaction (SMI) at Aalborg University (Denmark) in the period from September 2009 to March 2013. The research was supported by the Danish Research Council for Technology and Production (FTP). During this project five months, between April and August 2011, were spent at Duke University, Durham, NC, USA in collaboration with Dr. Warren M. Grill.

This thesis investigates the basic methodology behind the human nociceptive withdrawal reflex (NWR). The aims of this thesis were to investigate this methodology as a potential way of reducing the variability of NWR assessment and, if possible try, to discover methods which could help to reduce this variability. In order to fulfill these aims electrophysiological experiments, advanced mathematical modeling and anatomical studies were applied to investigate the elicitation and recording of the NWR.

This thesis contains four chapters. The Introduction presents the reader to the background and motivation for this project and gives a general overview of the PhD thesis. The Methods chapter introduces the used methods and elaborates the background for choosing them. The Results chapter presents and discusses the main findings in this thesis; in addition, all these findings are further elaborated in the original papers. The Conclusions chapter sums up the main findings and the impact on the state of the art, and finally looks at the perspectives towards future studies.

The thesis is based on three original papers that all are either published in, or submitted to, peer-reviewed journals. In addition one submitted peerreviewed paper and several conference abstracts were based on the research conducted in this project.

Keywords: Sensory-Motor interaction