



Curtin University



Faculty of Health Sciences

2020 Australian Government Research Training Program Scholarships

Strategic Project Profile

PROJECT TITLE: The biomechanics of lifting; development and validation of a field based sensor system

FIELD OF RESEARCH CODE: 1106

PROJECT SYNOPSIS: Wearable sensors are popular devices for tracking human movement quantity (e.g., number of steps) and quality (e.g., knee angles during walking). Yet to date, there is no automated method to track the trunk, and more specifically the lumbar spine, during lifting. Recent research in a Danish manual lifting population (n= 198) reported that the group with pain spent more time in greater amounts of trunk flexion than the group without a history of low back pain during a typical work day. This contradicts the common belief that bending is linked with low back pain. Applying a system that could 1) differentiate lifting from bending and 2) estimate the lumbar spine position and load during lifting related tasks in a field study, would be the logical next step in this innovative research area.

The student involved with this project would work within a multidisciplinary team that includes biomechanical, clinical, epidemiological, and computational experts to conduct a series of both laboratory and field based projects. Initially, laboratory data would be collected in order to develop and validate software that quantifies detailed lifting biomechanics from wearable sensor data. This technology would then be applied in a cross sectional field based

study involving manual workers. The aim of this project would be to comprehensively quantify the biological (lifting biomechanics), social and psychological differences between a population of manual workers with and without a history of low back pain. This body of work will provide the most in depth understanding of the association between lifting and low back pain to date.

WHAT MINIMAL ATTRIBUTES AND SKILLS EXPECTED BY THE CANDIDATE BE COMPETITIVE:

Honours 1 or 2A as well as a high level of numeric aptitude and strong communication skills that can be applied across multiple disciplines and within the community (i.e., study participants)

Students are advised to contact the Project Lead listed below prior to submission of their scholarship application to discuss their suitability to be involved in this strategic project.

PROJECT LEAD CONTACT

NAME: Professor Amity Campbell, Faculty of Health Sciences

EMAIL: a.campbell@curtin.edu.au

CO-SUPERVISOR

NAME: Professor Leon Straker, Faculty of Health Sciences

EMAIL: L.Straker@curtin.edu.au

CO-SUPERVISOR

NAME: Professor Peter O'Sullivan, Faculty of Health Sciences

EMAIL: P.OSullivan@curtin.edu.au