

**Proposal Title: Determining the Physiological Health Benefits of Work and Leisure Activities**

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**Key Participating Units:** Department of RPTS, College of Agriculture and Life Sciences  
Dept. of Industrial & Systems Engineering, College of Engineering  
Dept. of Environmental & Occupational Health, School of Public Health  
Department of Health and Kinesiology, Education & Human Development  
Dept. of Nutrition & Food Sciences, College of Agriculture and Life Sciences

**Anticipated Requested Amount:** \$39,900

**Executive Summary of the Intended Proposal:**

Understanding the physiological effects various behaviors have on one's body is integral to understanding benefits received and risks associated with participation. Until recently, the majority of studies in this area have had to use perceived effects as the primary dependent variable, as actual effects have been too difficult or cumbersome to attain in real-world settings. New technologies related to mobile human monitoring (MHM) and their respective apps, have made it possible to gather valid, accurate data on a multitude of physiological measures. With the use of these watches and apps, multiple fields could gain competitive advantage for obtaining external funding.

The primary researchers for this study will be Dr. James Petrick and his Tourism Marketing Lab in the Department of RPTS, Dr. Farzan Sasangohar in Industrial and Systems Engineering, Dr. Ranjana Mehta and her NeuroErgonomics Lab in the Department of Environmental and Occupational Health, Dr. J. Timothy Lightfoot and the Huffines Institute for Sports Medicine and Human Performance and Dr. Susanne Talcott in the Department of Nutrition Sciences. Multiple other researchers on campus would also likely greatly benefit from access to the equipment that will be requested in this proposal.

In order to aid in the understanding of actual health benefits and risks related to multiple various activities (i.e., work environments, travel, sports, PTSD of war veterans, study abroad, nutritional supplements, etc.) and to give Texas A&M researchers the upper hand in procuring future research in this area, we are requesting funding for 100 Apple Watches. With the use of an app developed by Dr. Sasangohar, Apple Watches can now capture a multitude of important physiological measures. The app employs a novel machine-learning algorithm that uses an array of sensors for heart rate, heart rate variability, electrodermal activity of skin, skin temperature, blood pulse volume, accelerometers, linear acceleration, and light sensors to infer the onsets of anxiety. With the use of his app and Apple watches, any researcher on campus could thus continuously assess each of these measures for a multitude of types of research including, but not limited to: clinical research, military training research, sports research, protection for industrial workers and pharma innovation and clinical trials.

The primary anticipated outcomes from this study is that physiological benefits/risks will be discovered for a multitude of different activities and groups of people. These outcomes will allow for pilot data to be collected, to aid in applying for larger grants from federal agencies (i.e., the National Institute of Health, National Science Foundation the United States Travel Association, etc.) to more fully determine what benefits and risks exist, and to determine best practices for individuals and companies. Additionally, Apple watches, and multiple other apps, could be used for a plethora of studies across the Texas A&M campuses (i.e., studies needing GPS, accelerometer or gyroscope data).