



Mathematics, Statistics and Computer Science Department

Announcing

PhD of Computational Sciences Dissertation Defense

MOTIVATIONAL AND INTERVENTION SYSTEMS AND MONITORING WITH MHEALTH TOOLS

By

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Abstract

Use of mobile and telecommunication technologies has become widespread in the last decade. With this development, use of mobile devices in healthcare (mHealth) is also increasing. Mobile phones, smartphones, and other mobile devices are affordable tools for different health-related services. In my research, I have helped to develop several mHealth tools to addressing the quality of life of cancer survivors, cancer patients and individuals at increased risk for cancer. Tobacco smoking is the major cause of several types of often-fatal cancers and cardio-respiratory diseases. Optimally, it is hypothesized that the most effective mHealth tools should be customized and personalized. For smokers, the goal is to encourage cessation. For cancer survivors, one goal is to increase physical activity, which is associated with decreased rates of recurrent disease. In patients with incurable cancers, efficient and current monitoring of symptoms should contribute to better palliation. This dissertation explores multiple issues in use of mHealth tools with these medical populations. I discuss a general framework for collecting and managing healthcare data and mathematical models for data analysis. The specific contributions of this dissertation are: 1) The design and development of a culturally tailored customized text messaging system for motivation and intervention, 2) The design and development of a data collection system for a mHealth intervention, 3) A model for monitoring pain levels using mobile devices.

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