



University
of Manitoba

STATISTICS SEMINAR

Thursday, February 13th, 2020
111 Armes Bldg
3:45 p.m.

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“Comparing Regularized Logistic Regression and Random Forest Approaches for Daytime Diagnosis of Obstructive Sleep Apnea”

Abstract

Obstructive sleep apnea (OSA) is a prevalent yet underdiagnosed health problem. Assessment of OSA is currently based on sleep studies that are time-consuming and expensive. Developing technologies for quick OSA screening is momentous. Studies have been shown that the upper airways (UA) structural and physiological changes can alter the tracheal breathing sounds (TBS) characteristics. We hypothesize the TBS analysis during wakefulness correlate with the severity of OSA and could represent physiological characteristics of UA. In the context of TBS analysis, it is possible to extract a considerable number of features from data. A major challenge in high-dimensional data analysis is related to building parsimonious models and removing variables that do not add any information to our model. This study aims to assess the utility of two important machine-learning techniques to classify subjects with OSA using their daytime TBS. We evaluate and compare the performance of the Random Forest (RF) and Regularized Logistic Regression (LR) as feature selection tools and classification approaches for wakefulness OSA screening. The findings of this study may help in enhancing the current OSA algorithms by providing a non-time-consuming and less expensive method to stratify the severity of OSA patients in a fast but more precise way.

Biography

I received my B.Sc. in Software Engineering from Shiraz University, Iran in 2013. At that time, I won the Shiraz University Distinguished Student Award in the Computer Engineering department. Later, I completed my M.Sc. in Artificial Intelligence, with a focus on community detection in social networks from Shiraz University in 2015. Then, I moved to Winnipeg in September 2015 to pursue my Ph.D. in Dr. Moussavi's group, where I work on Obstructive Sleep Apnea detection using tracheal breathing sounds during wakefulness and sleep. I have been the winner of a few awards including the International Graduate Student Entrance Scholarship (IGSES), the International Graduate Student Scholarship (IGSS), the University of Manitoba Graduate Fellowship (UMGF), and Sir Gordon Wu Prestigious Graduate Student Scholarship.

Light refreshments will be served between 3:15-3:45 p.m. in 318D Machray Hall