Division of Biostatistics, IHE
Medical College of Wisconsin presents

Predictive Analysis: On Knee-X-ray Image and Mosquito Spectral Data

By: Manzur Faraji, PhD

The aims of this study are to develop predictive algorithms for two practical applications: classification of knee osteoarthritis (OA) based on knee x ray image and age prediction of mosquitoes based on near infrared spectra (NIRS) data. For the OA classif

to two levels of OA severity, healthy knee vs. OA knee, we achieved more than 85% accuracy. This dissertation successfully identified ROI developed width based features which are easy to implement and have a strong OA discriminating power.
For the NIRS based age prediction problem on mosquito vectors, we develop a change-point model that corrects the problem of under-estimation and over-estimation of age based on existing methods. It is known that the NIRS spectra have a strong relationship with age. We demonstrate that this relationship is not linear, and the linear relationship causes the under and over-estimation of age prediction. We propose a change-point model that assume different relationships for the young and old mosquitoes. The change-point at which this relationship changes is unknown, and an algorithm is developed to estimate this change point. This algorithm yields the estimated change-points 8 days and 7 days for two studied mosquitoes which are almost the same as the widely used 7 days for classifying mosquitoes into young or old. We show that the change

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Biography: Dr. Manzur Faraji graduated from Marquette University in May of 2021 with a Ph.D. in Computational Sciences (Statistics and Data Science.

He currently works as a Biostatistician I in the Department of Pediatric Surgery.

Location: Zoom | https://mcw-edu.zoom.us/j/94231355250?pwd=aTB1aVdteXhONHJYM0Z5djNsNklVZz09

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