Leveraging AutoML to provide NAFLD screening diagnosis: Proposed machine learning models


1Shifa College of Medicine, STMU, Islamabad, Pakistan
2Working group 3, COST Action EVidence-Based RESearch (EVBRES), Western Norway University of Applied Sciences, Bergen, Norway

Introduction

• Non-alcoholic fatty liver disease (NAFLD) is reported to be the only hepatic ailment increasing in its prevalence concurrently with both; obesity & Type 2 Diabetes Mellitus.
• Abdominal ultrasonography is done for NAFLD screening diagnosis which has a high monetary cost associated with it.
• In the wake of a massive strain on global health resources due to COVID-19 pandemic, NAFLD is bound to be neglected and shelved.
• Machine learning is explored, here, to propose screening-diagnostic tools for NAFLD that can be easily deployed without the requirement of substantial resources and can provide instantaneous screening-diagnosis predictive results.

A study comparing the presented models’ predicted diagnosis with an abdominal ultrasound diagnosis for NAFLD, the predictions subsequently assessed against hepatic biopsy, is proposed to be in order to explore the presented models’ potential to replace abdominal ultrasound as a screening diagnostic modality for NAFLD.

Results

• All 8 of the algorithms, trained in accordance with the aforementioned Homogenous Development Framework, Came out to give good discriminating ability to designate the dichotomous variable of interest. (Table 3)
• Random Forest came out to have the highest discriminating ability with a computation time of 9 minutes.
• Out of the proposed models, KNN had the least AUC but a considerably less computation time of only 6 seconds.

Materials & Methods

• The study takes in data2 from Huang BX et al.; 4053 subjects, 2436 men and 1617 women between 20 and 88 years of age, after excluding those patients that had a history of co-morbid conditions as well as those with a lack of hepatic ultrasonography data.
• The Grafl criteria was adopted to designate Fatty liver disease on ultrasonography.
• Mijar(3), the current state-of-the-art AutoML zero-code platform to develop machine learning models that are trained to have a good discriminating ability to predict NAFLD using only anthropometric measures. The proposed models neither require costly analysis so that variables, such as ultrasonographic signals, may be fed into them for training nor do they require considerably high computation time & resources to be deployed.

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Our proposed models are the very first effort, to the best of our knowledge, to leverage the current state-of-the-art autoML zero-code platform to train machine learning models that are proposed to have a good discriminating ability to predict NAFLD using only anthropometric measures. The proposed models neither require costly analysis so that variables, such as ultrasonographic signals, may be fed into them for training nor do they require considerably high computation time & resources to be deployed.

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