



MOTIVATION

- Heart diseases are amongst the major cause of death throughout the world from the past decade (WHO,2018). Diabetics, Blood pressure and cholesterol levels are amongst the main contributing factor for heart related diseases.
- Some of the risk factors associated with heart diseases can be traced back to family medical history, smoking and drinking patterns of the particular patient and poor health diet.
- If heart disease vital signs are not properly detected, monitored and contained at an early stage they can lead to critical health conditions such as heart attack, stroke and angina(a number of disorders of which here is an intense localized pains e.g. chest pains)

PHENOMENON BEHAVIOUR /PROBLEM STATEMENT

There is a lack of data accuracy and consistency when dealing with heart disease prediction and detecting early signs for heart attack , stroke and angina.

STATEMENT OF THESIS

This research work seek to address the issues of data accuracy when predicting heart diseases and vital signs, by applying data mining algorithms, machine learning tools and IoT platform.

RESEARCH QUESTION

The research question in this work stemmed from the above research problem statement and is submitted as follows:

How can machine learning , data mining algorithms and machine application platforms be used to address the challenges of data accuracy when predicting heart diseases and vital signs?

In order to effectively answer the research question, the following sub-questions must be answered.

- What machine learning tools can be used to address the problem and the research question?
- Which data mining algorithms can be adopted to enhance data accuracy in the heart disease predictions?
- What Ai application platforms can be used to address the phenomenon?
- What mechanism can be used to evaluate the adopted machine learning, data mining and IoT application that they indeed have enhanced data accuracy ?

OBJECTIVES

The goal of this research is to propose a model(Machine learning tool, data mining algorithm) which can enhance the accuracy of heart disease predictions and the detection of vital signs. This can be achieved by going through the following aims.

- To study and compare different Machine learning tools.
- To study and compare different data mining techniques to enhances data extraction, data processing and provide accurate results
- that can result in critical life-threatening situations.
- To formulate a scenario ,prototype it and test for its accuracy .

RESEARCH METHODOLOGY

Philosophical worldview

Computational Artefacts { building mathematical solutions to address a particular phenomenon}

Research Design

Non-Empirical {algorithms, model building, theory building, mathematical proof}

Research methods

Theoretical {argumentation, prototype, simulation}

Choose dataset from A retrospective sample of males in a heart-disease

high-risk region of the Western Cape, South Africa

Build model by running this datasets on Python

Choose data mining technique , classification (decision tree)

Choose data mining algorithms (K-NN (K-nearest neighbour), SVM(support vector Machine), Naïve bayes),

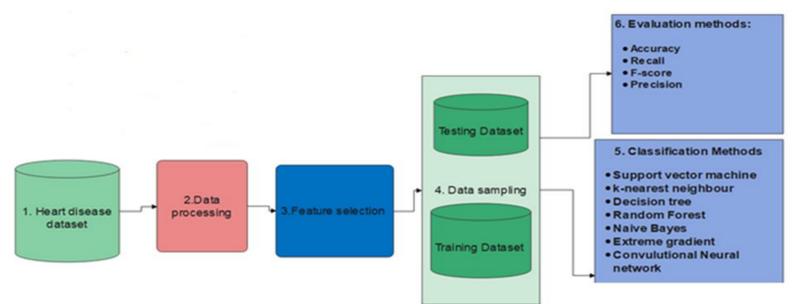
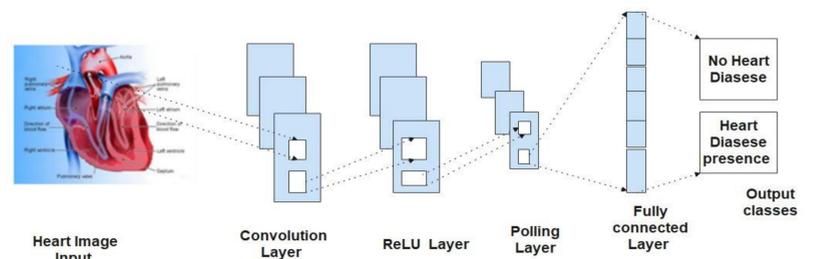
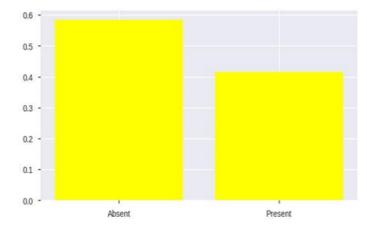
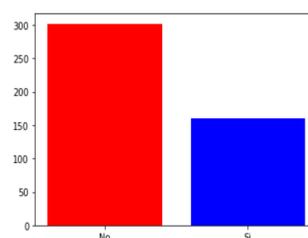
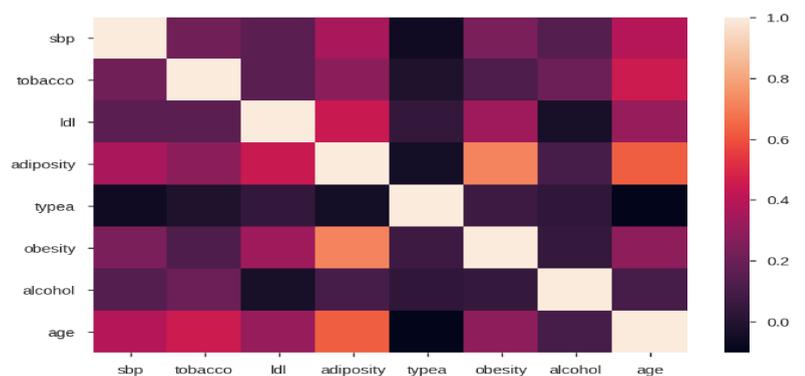


Diagram of the proposed methods



Proposed convolutional neural network architecture.

EXPERIMENTS



Model	1.Accuracy
1. Logistic Regression	95.83
2. Naïve Bayes	81.11
3. Random Forest	89.72
4. Decision tree	79.72
5. Support vector	99.16
6. K-neighbour neighbour	97.70
7. Convolutional Neural network	99.86

Model	8.Accuracy
1. BaggingClassifier	91.66
2. AdaBoostClassifier	43.33
3. Extreme Gradient Boost	94.72
4. GradientBoostingClassifier	89.16
5. xgboost	88.33
6.Convolutional Neural network	99.86

EXPECTED CONTRIBUTIONS

The key contributions of this Thesis work area:

- An enhanced heart disease prediction model that would assist in predicting vital signs before the turn into critical situation the smart healthcare domain.
- A formal model to trigger vital signs based on the accuracy of the patient's data.