AVALANCHE FORECASTING PREDICTION USING AUTO-AI SERVICE
PROJECT REPORT

Submitted By:

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CONTENTS

ABSTRACT

Conventional avalanche forecasting is practiced as a mix of deterministic treatment for snow and weather parameters and inductive logic to reach actual forecast decisions. Inductive logic of the scientific method dominates,making frequent use of iteration and redundancy to minimize decision uncertainties.The model gets the data from the IOT based sensors.After that we want to process those data using suitable Machine learning algorithms, then our model display the total snow depth occurs.The project is to prevent the people from the avalanche by priory informing them by the total snow depth.

1.INTRODUCTION:

The word Avalanche refers to snow and ice.It means a mass of snow,ice, rocks, slush falling rapidly down a mountain. Snow avalanches are among the most destructive natural hazards threatening human life, ecosystem,built structure,and landscapes in mountainous regions. Each year avalanche kills more than 150 people worldwide. The most common cause of death by avalanche is asphyxiation. If the person buried under an avalanche more than 15 minutes then there is no chance of survive. So, the life of the people in that region is difficult to live.

1.1 OVERVIEW:

To analyze the data, coming from different sensors we are applying various machine learning algorithms. If there is a chance of avalanche then the notification will be sent to people so that they can take decisions accordingly. Avalanche is leading cause of major event occur in winter or spring.This may cause severe disaster to human and many lives.We demonstrate of the use of Machine Learning to build the model which predicts the avalanche level.

1.2 PURPOSE:

The main objective is to prevent the people from the avalanche by priory informing them there is a chance to the occurrence of avalanche or not. The model gets the data from the IOT based sensors. After that we want to process those data using a suitable algorithm, then our model display the total snow depth. To analyze the data coming from different sensors we are applying various machine learning algorithms.By total snow depth we know whether there is a chance of avalanche then the notification will be sent to people so that they can take decisions accordingly.

2. LITERATURE SURVEY:

2.1 EXISTING PROBLEM:

With the collected data of slope,forest density,snow density, Air temperature and wind, the main aim of the project is there is a chance of avalanche then the notification will be sent to people so that they can take decisions accordingly. Avalanche Warning Service uses avalanche problems in their bulletins to provide a compact, yet exact, description for the end user of the current conditions.The type of expected avalanche, the cause of the avalanche, the likelihood, expected size, amount of extra load that is necessary for triggering and finally where in the snow pack we expect the avalanche to be released.

2.2 PROPOSED SOLUTION:

The model gets the data from the IOT based sensors. with the collected data from the model is build with the machine learning algorithm and proposed steps applied to those data, then our model display whether the avalanche occur or not and how strength it was. If there is a chance of avalanche then the notification will be sent to people so that they can take decisions accordingly. Here with these steps we proceed our model, first the data is collected with the specific resources. Secondly the model is

build using Auto-AI experiment in Watson Studio and collected data is imported.Thirdly the model is evaluated using RMSE and it is deployed and tested in Watson studio.Then our web application is created using node red.

3. THEORETICAL ANALYSIS:

3.1 BLOCK DIAGRAM
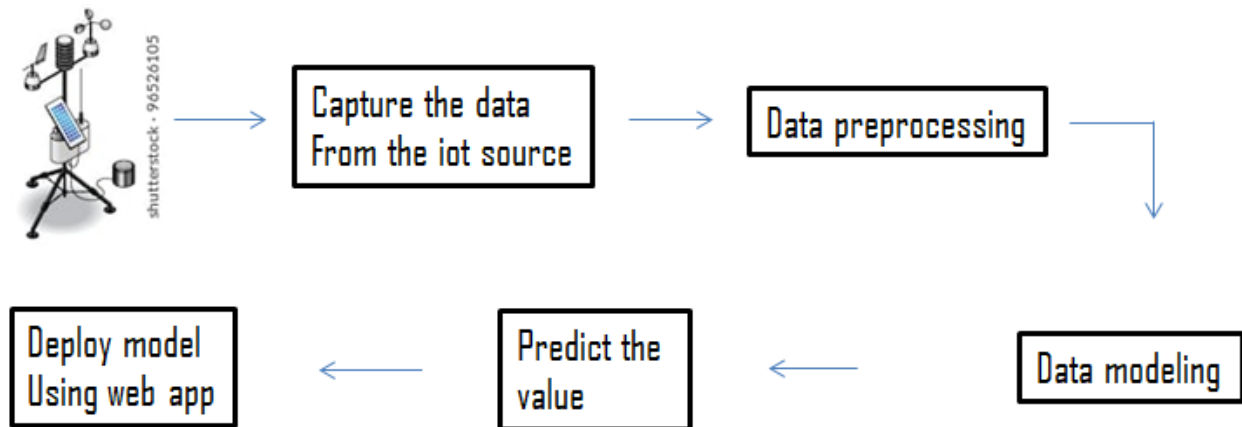
3.2 HARDWARE/SOFTWARE DESIGNING:

For hardware we need IOT based sensors. With the IOT based sensors We collect the data which is given as input to the web page.
For software we need compatible operating system for Auto-AI, HTML and CSS, software used for node red implementation and web deployment
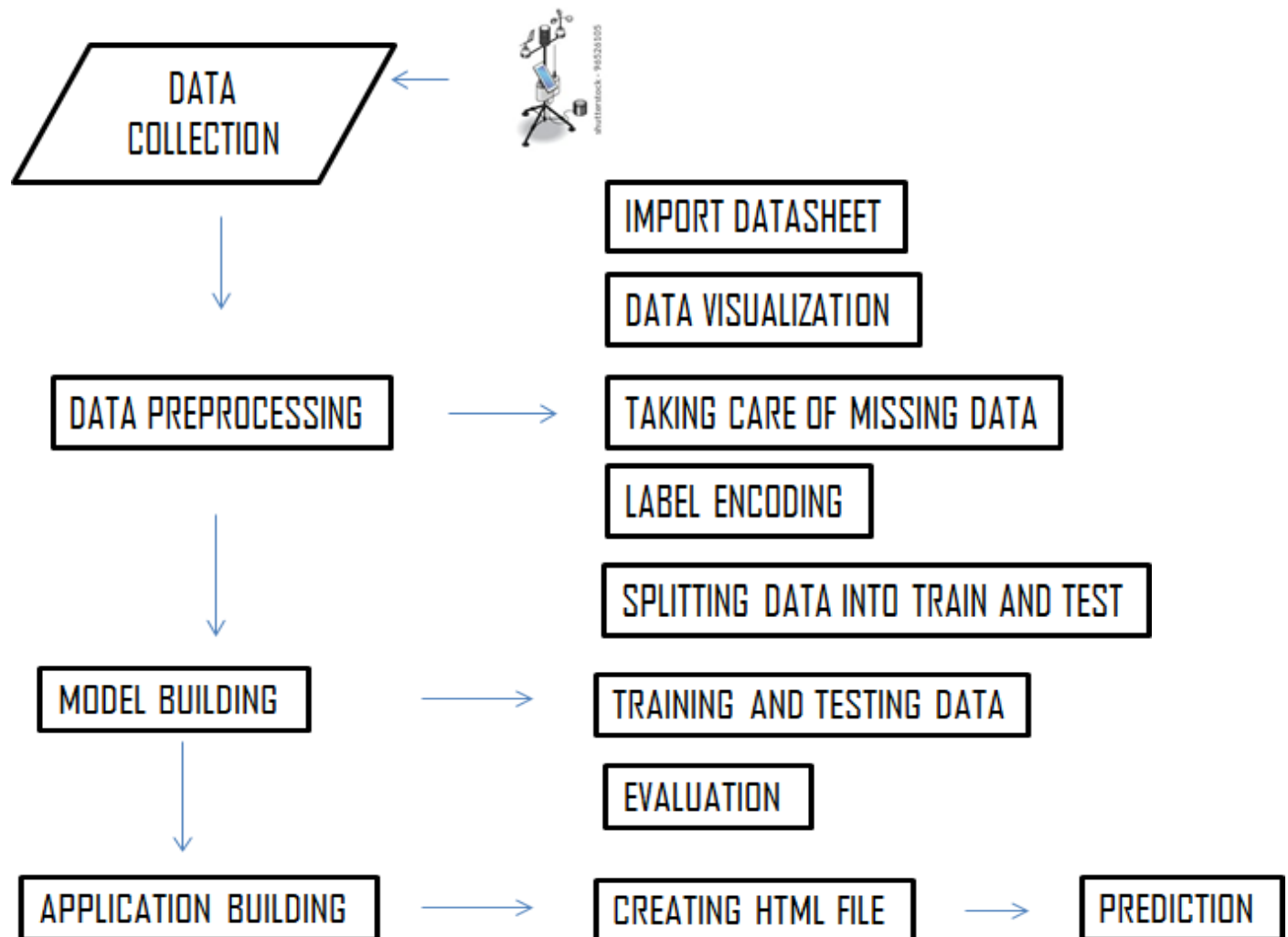1)Watson Studio
2)Node red

4. EXPERIMENTAL INVESTIGATION:

The avalanche is predicted with the given input level such as
1)Date/Time
2)Temperature

3)Relative Humidity
4)Intermittent/Shot Snow

5. FLOW CHART:

6. RESULT:

We got an optimized RMSE of 14.418 which is a good measure for a Machine Learning algorithm used called Extra Trees Regressor the model predicts the avalanche chances with good efficiency.

7. ADVANTAGE & DISADVANTAGE:

ADVANTAGES:

1) Effective prediction of avalanche chances

2)Easily accessible web framework

3)Efficiency is maintained asap by updating data

DISADVANTAGES:

1) To predict the efficient output, necessary input is required

2) Updating the data set is tedious process

8. APPLICATION:

1)Avalanche plays an important event during winter and spring.

2)The application using node red frame with the help of Auto-AI service model Regression RMSE,with this application we can help may lives.

9.CONCLUSION:

Using Machine learning model we predict the Total Snow Depth at particular Date and Time

1) Date/Time

2) Temperature

3)Relative Humidity

4)Intermittent/Shot Snow

10. FUTURE SCOPE:

Using avalanche prediction we could predict time that at which time there is a chance of avalanche occur.
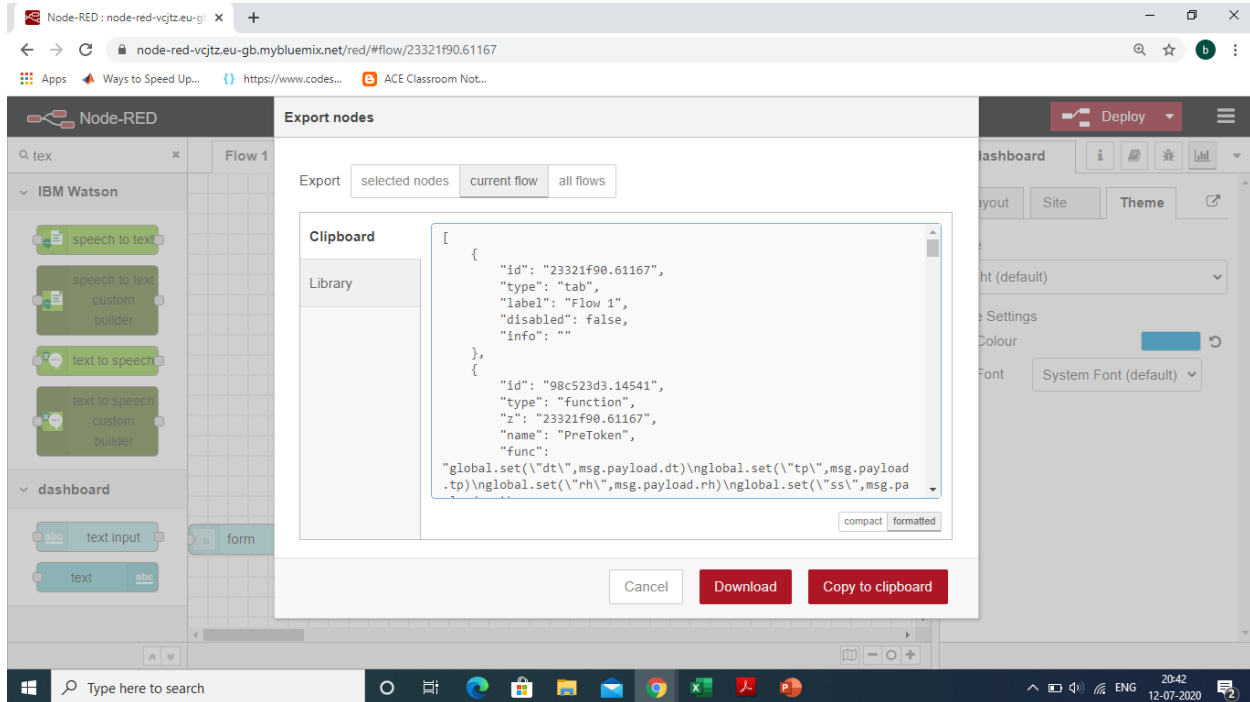
11.BIBILOGRAPHY:

• Dataset –kaggle

https://www.kaggle.com/vinaynomula/avalanche-forecasting-prediction

12.APPENDIX:

A.Source Code:

B.UI Output Screenshot: