



Project Report

3D Printer Material Prediction using Watson Auto AI

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INDEX

Project Details Acknowledgment

1.INTRODUCTION

2.LITERATURE SURVEY

a. Existing problem

b. Proposed solution

3.THEORETICAL ANALYSIS

a. Block diagram

b. Hardware / Software designing

4.EXPERIMENTAL INVESTIGATION

5.FLOW CHART

6.RESULT

7.ADVANTAGES & DISADVANTAGES

8.APPLICATION

9.CONCLUSION

10.FUTURESCOPE

11.BIBLIOGRAPHY

APPENDIX

Project Details

Project ID : SPS_PRO_305

Project Title : 3D Printer Material Prediction using Watson Auto AI

Duration : 4 Weeks

Project Support : SmartBridge Educational Services

Project Mentor : Mr. Rammohan Bethi

Kickoff Date : June 1st, 2020

Finish Date : June 30th, 2020

ACKNOWLEDGEMENT

This project has taken a considerable amount of time and resources. I would like to acknowledge the help of all of those who have made this project possible. In finical I would like to thank my supervisor Mr. Rammohan Bethi for his time, patience and guidance, and also for allowing the idea to be pursued primitively. I would also like to thank Mr. Vinay Kumar Nomula for his help. Further to these people I would like to thank the members of the Smartbridge career workshop for their technical help in setting up various codes and faults. Also, I would like to thank all of my co-interns who have worked on the Open Source projects without whose efforts this project would not have been possible.

1.INTRODUCTION

3D printing is high-tech and fairly predictable process these days. However, one issue that still persists is how to avoid printing objects that don't meet expectations and thus can't be used, leading to a waste in materials and resources. Scientists at the University of Southern California's (USC's) Viterbi School of Engineering has come up with what they think is a solution to the problem with a new machine-learningbased way to ensure more accuracy when it comes to 3Dprinting jobs.

2.LITERATURE SURVEY

a. Existing problem

3D printing materials, usually called by their traditional names such as ABS, nylon and more are available in the majority, but you have to be aware that many of the 3D printing materials only mimic true thermoplastics.

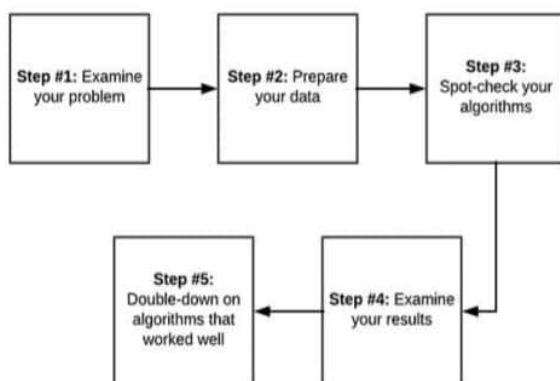
Choosing the right material allows you to improve the shape, quality and function of your 3d printed part. Hence, selection of the correct 3D printing material is highly essential. To identify the type of material required after a 3D model is designed is a complicated task. The aim of the study is to determine the best material which will be perfect for the given use case. Where there are eleven setting parameters and one output parameters. Based on these input parameters we have to predict the best material for model. This model will predict whether to use ABS or PLA.

b. Proposed Solution

We are building a IBM Watson AutoAI Machine Learning to predict the material. The model is deployed on IBM cloud to get scoring end point which can be used as API in mobile app or web app building. We are developing a web application which is built using node red service. We make use of the scoring end point to give user input values to the deployed model. The model prediction is then showcased on User Interface. This model is to predict the best material to be used for building 3D models.

3.THEORETICAL ANALYSIS

a. Block diagram



b.Hardwar/ Software designing

The project has been done by using IBM Cloud in which machine learning service, Watson studio and cloud storage service (to store the data) have been created by using the options available in Catlog.

4.EXPERIMENTAL INVESTIGATION

There are six steps in experimental investigation on of a general project:

- 1. Choose a Project Idea***
- 2. Conduct Background Research***
- 3. Compose a Hypothesis***
- 4. Design your Experiment***
- 5. Collect Data***
- 6. Analyse Data and Draw Conclusions***

5.FLOW CHART



6.RESULT

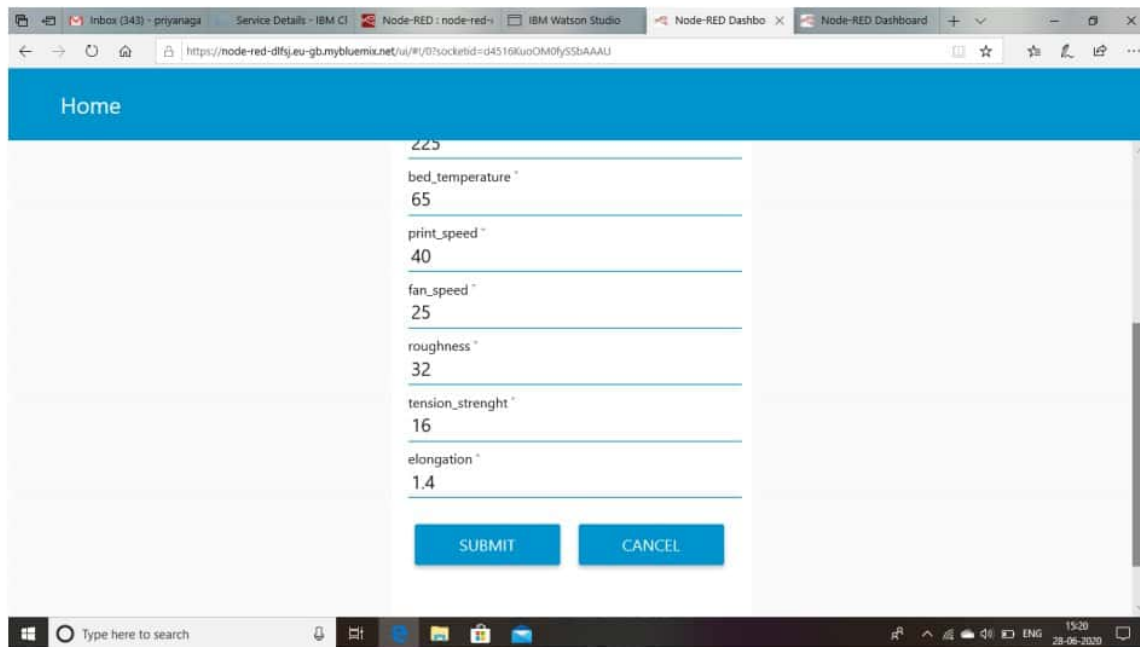
After the implementation, deployment of project the result

i.e. predicted the material of can be seen in Node Red UI.

This value depends on different parameters. The Node Red

UI provide us simple way to get the result of Auto AI Experiment.

Here is the Node Red UI predicts the cost of health insurance



7.ADVANTAGES & DISADVANTAGES

The advantages are easy to implement, accessibility is fast, continuous Improvement, wide application, available 24x7, no human intervention needed. We can handle multi-dimensional and multi-variety data. Where as the disadvantages are lack of security, loss of control on data, high error susceptibility, dependence of network/providers.

8.APPLICATION

Using The Auto AI Experiment, one can build and deploy a machine learning model with sophisticated training

features. In the given project we can predict the price of the required vehicle by giving few input parameters.

9.CONCLUSION

In this project by using IBM Cloud the model processing is been done in Auto AI services in IBM cloud and then the deployment is been done in Watson studio and application is build using Node red service which has been successful as we are able to get the desired output.

10.FUTURE SCOPE

As we are developing day to day there is a continuous growth of Auto AI and Machine Learning. The web

application can be used to predict the cost of the health insurance accurately, precisely and efficiently instead of n number of people being involved directly or indirectly.

BIBLIOGRAPHY

The whole project uses different services which are listed below

- IBM Cloud***
- Watson Studio Auto AI***
- Node Red Application***
- Cloud Storage Service***

APPENDIX

Source code:


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