PREDICTING THE AGE OF ABALONE

1. INTRODUCTION

1.1 OVERVIEW

Abalone is a shellfish considered a delicacy in many parts of the world. An excellent source of iron and pantothenic acid, and a nutritious food resource and farming in Australia, America and East Asia. 100 grams of abalone yields more than 20% recommended daily intake of these nutrients. The economic value of abalone is positively correlated with its age. Therefore, to detect the age of abalone accurately is important for both farmers and customers to determine its price.

However, the current technology to decide the age is quite costly and inefficient. Farmers usually cut the shells and count the rings through microscopes to estimate the abalone's age. Telling the age of abalone is therefore difficult mainly because their size depends not only on their age, but on the availability of food as well. Moreover, abalone sometimes form the so-called 'stunted' populations which have their growth characteristics very different from other abalone populations This complex method increases the cost and limits its popularity. Our goal is to find out the best indicators to forecast the rings, then the age of abalone.

1.2 PURPOSE

To detect the age of abalone accurately is important for both farmers and customers to determine its price.The current technology to decide the age is quite costly and inefficient. Farmers usually cut the shells and count the rings through microscopes to estimate the abalone's age. Telling the age of abalone is therefore difficult mainly because their size depends not only on their age, but on the availability of food as well. Moreover, abalone sometimes form the so-called 'stunted' populations which have their growth characteristics very different from other abalone populations This complex method increases the cost and limits its popularity. Our goal is to find out the best indicators to forecast the rings, then the age of abalone.

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

In recent years, deep learning has been used in various applications including the predicting the age of abalone. Various researchers introduced different classification algorithms, but they still face the problems of low accuracy and misclassification of other target objects. Hence, there is still a need to do more research on solving the above problems to protect the abalones.

2.2 PROPOSED SYSTEM

In order to solve the problems for the accuracy of the classification system, we proposed a new classification model. First, based on the pretrained models, the models were fine-tuned with the public dataset we used. Based on their performance, the best model was selected in order to further adjust the performance for high accuracy in predicting the age of abalone. After selecting the best model, the model was adjusted, and classification was conducted based on the modificationof the network.

3. THEORETICAL ANALYSIS

3.1 BLOCK DIAGRAM
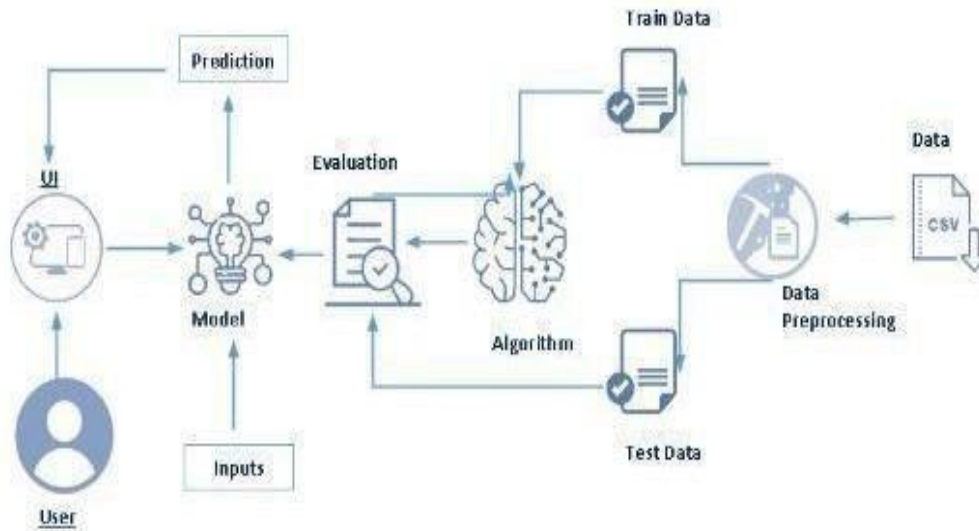
3.2 HARDWARE AND SOFTWARE DESIGNING

Python

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. It was created by Guido van Rossum , and first released on February 20, 1991. Its high-level built in data structures, combined with dynamic typing and dynamic binding , make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together. Python's simple, easy to learn syntax emphasizes readabilityand therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse. The Python interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed.

Anaconda Navigator

Anaconda Navigator is a free and open-source distribution of the Python and R programming languages for data science and machine learning related applications. It can be installed on Windows, Linux, and macOS.Conda is an open-source, crossplatform, package management system. Anaconda comes with so very nice tools like JupyterLab, Jupyter Notebook,

QtConsole, Spyder, Glueviz, Orange, Rstudio, Visual Studio Code. For this project, we willbe using Jupyter notebook and Spyder.

Jupyter Notebook

The Jupyter Notebook is an open source web application that you can use to create and share documents that contain live code, equations, visualizations, and text. Jupyter Notebook is maintained by the people at Project Jupyter. Jupyter Notebooks are a spin-off project from the IPython project, which used to have an IPythonNotebook project itself. The name, Jupyter, comes from the core supported programming languages that it supports: Julia, Python, and R. Jupyter ships with the IPython kernel, which allows you to write your programs in Python, but there are currently over 100 other kernels that you can also use.

Spyder

Spyder, the Scientific Python Development Environment, is a free integrated development environment (IDE) that is included with Anaconda. It includes editing, interactive testing, debugging, and introspection features. Initially created and developed by Pierre Raybaut in 2009, since 2012 Spyder has been maintained and continuously improved by a team of scientific Python developers and the community.Spyder is extensible with first-party and third party plugins includes support for interactive tools for data inspection and embeds Pythonspecific code. Spyder is also pre-installed in Anaconda Navigator, which is included in Anaconda.

Flask

Webframework used for building. It is a web application framework written in python which will be running in local browser with a user interface. In this application, whenever the user interacts with UI and selects emoji, it will suggest the best and top movies of that genre to the user.

Hardware Requirements:

Operating system: window 7 and above with 64bitProcessor Type -Intel
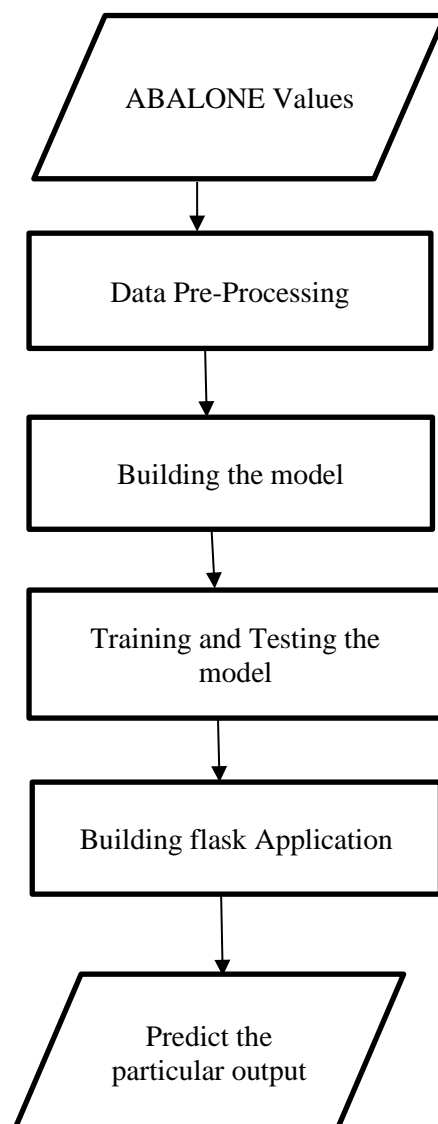
Core i3-3220

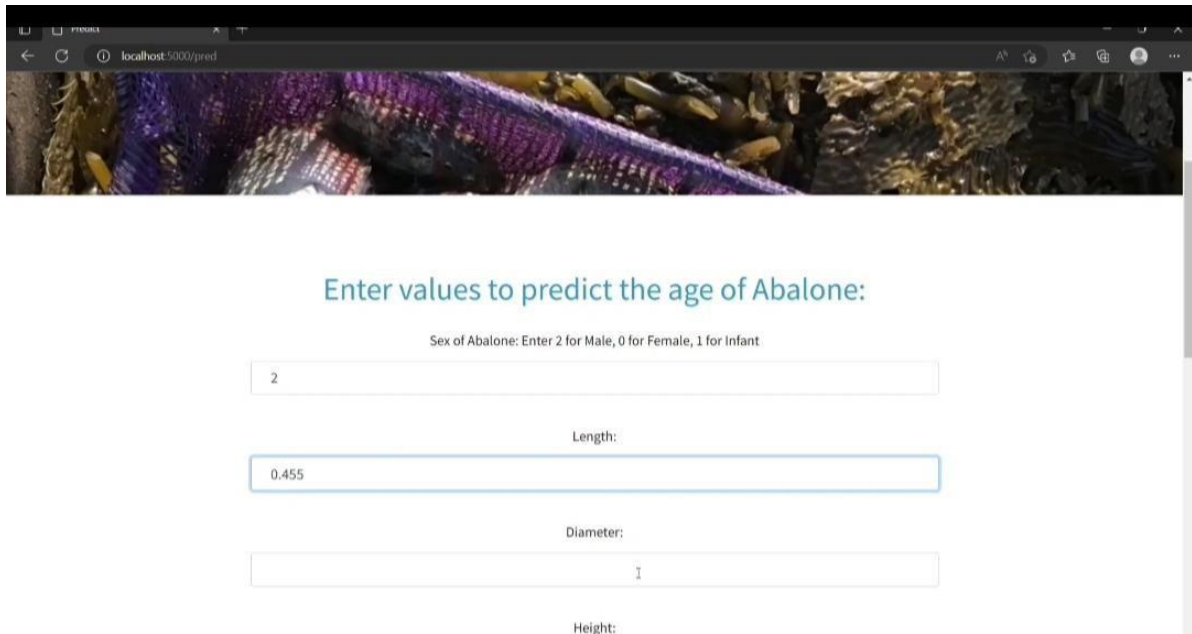RAM: 4Gb and above

Hard disk: min 100GB

4. EXPERIMENTAL INVESTIGATION

The text data need to be organized before proceeding with the project. The original dataset has a single folder. We will be using the Abalone.csv file to fetch the text data of training data. The datas need to be unique and all fields need to be filled.The dataset images are to be pre-processed before giving to the model. We will create a function that uses the pre-trained model for predicting custom outputs. Then we have to test and train the model. After the model is build, we will be integrating it to a web application

5. FLOWCHART

```
┌─────────────────────────┐
│     ABALONE Values      │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│   Data Pre-Processing   │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│    Building the model   │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│  Training and Testing   │
│        the model        │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│ Building flask Application │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│      Predict the        │
│   particular output     │
└─────────────────────────┘
```

6. RESULT

Shucked-weight:

0.2245

Viscera-weight:

0.101

Shell-weight:

0.1

Predict

Viscera-weight:

Shell-weight:

Predict

The predicted age of abalone is 15.0 years.

ADVANTAGES

Easy to use

• Cost efficient

• Time efficient

7. CONCLUSION

The current technology to decide the age is quite costly and inefficient. Farmers usually cut the shells and count the rings through microscopes to estimate the abalone's age. Telling the age of abalone is therefore difficult mainly because their size depends not only on their age, but on the availability of food as well. Moreover, abalone sometimes formthe so-called 'stunted' populations which have their growth characteristics very different from other abalone populations This complex method increases the cost and limits its popularity. Our goal is to find out the best indicators to forecast the rings, then the age of abalone.

8. FUTURE SCOPE

In future works, the proposed method will be improved in order to Predicting the age of Abalone with extra features using more advanced technology.

9. BIBILOGRAPHY

https://www.kaggle.com/rodolfomendes/abalonedataset

https://github.com/nishitpatel01/predicting-age-of-

abalone-using-regression

APPENDIX SOURCE CODE

App.py

```python
import numpy as np
import pickle
from flask import Flask,request, render_template
app=Flask(__name__,template_folder="templates")
model = pickle.load(open('abalone1.pkl', 'rb'))
@app.route('/', methods=['GET'])
def index():
    return render_template('home.html')
@app.route('/home', methods=['GET'])
def about():
    return render_template('home.html')
@app.route('/pred',methods=['GET'])
def page():
    return render_template('upload.html')
@app.route('/predict', methods=['GET', 'POST'])
def predict():
    input_features = [float(x) for x in request.form.values()]
    features_value = [np.array(input_features)]
    print(features_value)


    features_name = ['Sex','Length','Diameter','Height','Whole weight','Shucked weight','Viscera
weight','Shell weight']
    prediction = model.predict(features_value)
    output=prediction[0]
    print(output)
    return render_template('upload.html', prediction_text='The predicted age of abalone is {}
years.'.format((output)))



if __name__ == '__main__':
    app.run(debug=False)
```

home.html

```html
<!DOCTYPE html>
<html>
<head>
<title>Home</title>
<style>
.navbar
{
margin: 0px;
padding:20px;
background-color:;
opacity:0.6;
color:black;
font-family:'Roboto',sans-serif;
font-style: italic;
border-radius:20px;
font-size:25px;
}
a
{
```

```css
color:grey;
float:right;
text-decoration:none;
font-style:normal;
padding-right:20px;
}
a:hover{
background-color:black;
color:white;
border-radius:15px;0
font-size:30px;
padding-left:10px;
}
p
{
color:white;
font-style:italic;
font-size:30px;
}
body
{
background:lineargradient(rgba(0,0,0,0.8),rgba(0,0,0,0.8)),url("https://as2.ftcdn.net/v
2/jpg/01/16/98/39/1000_F_116983928_Z5QD7UDlwukiVWx6GKturYgtwWohM5kl.
jpg");

height: 125vh;
   -webkit-background-size: cover;
   background-size:cover;
   background-position: center center;
   position: relative;
}
</style>
</head>
<body>
```

```html
<div class="navbar">
<a href="/Prediction" >Predict</a>
<a href="/Home">Home</a>
<br>
</div>
<br>
<center><b><font color="white" size="15" font-family="Comic Sans MS" >Human
Development Index</font></b></center>
<div>
<br>
<center>
```

<p>Abalone is a shellfish considered a delicacy in many parts of the world. An excellent source of iron and pantothenic acid, and a nutritious food resource and farming in Australia, America and East Asia. 100 grams of abalone yields more than 20% recommended daily intake of these nutrients. The economic value of abalone is positively correlated with its age. Therefore, to detect the age of abalone accurately is important for both farmers and customers to determine its price.

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```html
</p>
</center>
</div>
</body>
</html>
```

indexnew.html

```html
<html>
<style>
div.header1{
top:20;
position: fixed;
 padding-left: 490px;
}


*{
    margin:0;
        padding:0;
        border:0;
        outline:0;
        text-decoration:none;
        font-family:montserrat;
}


body
{
background-
image:url('https://as2.ftcdn.net/v2/jpg/03/85/02/25/1000_F_385022542_kJWoZb9N
WBLFnCpcC7ZYD4KQ4EYQUQz5.jpg');
background-position: center;
font-family:sans-serif;
background-size:cover;
margin-top:40px;
}


.main{
        background-color:rgb(0,0,0,0.6);

        width:800px;
```

```css
        height:590px;
        margin:auto;
        position:center;
        border-top-left-radius:100px;
        border-bottom-right-radius:100px;


}
.main   input[type="text"],.main   input[type="text"],.main   input[type="text"],.main
input[type="text"],.main       input[type="text"],.main       input[type="text"],.main
input[type="text"]{
        border:0;
        background:none;
        display:block;
        margin:20px auto;
        text-align:center;
        border:2px solid #3498db;
        padding:10px 3px;
        width:280px;
        outline:none;
        color:white;
        border-radius:24px;
        transition:0.25s;


}
.bor{
border:0;
        background:none;
        display:block;
        margin:20px auto;
        text-align:center;
        border:2px solid #8e44ad;
        padding:10px 3px;
        width:500px;
        outline:none;
```

```css
        color:white;
        transition:0.25s;}
.main          input[type="text"]:focus,.main          input[type="text"]:focus,.main
input[type="text"]:focus,.main                         input[type="text"]:focus,.main
input[type="text"]:focus,.main                         input[type="text"]:focus,.main
input[type="text"]:focus{
        width:280px;
        border-color:#8e44ad;
}
.logbtn{
        display:block;
        width:35%;
        height:50px;
        border:none;
        border-radius:24px;
        background:linear-gradient(120deg,#3498db,#8e44ad,#3498db,#8e44ad);
        background-size:200%;
        color:#fff;
        outline:none;
        cursor:pointer;
        transition:.5s;
        font-size:25;
}
.logbtn:hover{
        background-position:right;
}

input::placeholder{
        color:#F5FFFA;
}
.bottom-text{
        margin-top:60px;
        text-align:center;
        font-size:13px;
```

```html
}
</style>
<body>
    <center><div class="header1"><font color="#FF0000" font-family="Fascinate Inline" size=7 ><b>Predicting the age of
                abalone
</b></font></div></center>
<br><br><br><br><br>
<form class="main" action="/predict" method="post">
<br>
<input class="form-input" type="text" name='Sex of abalone'  placeholder="Enter 2 for male,0 for female,1 for infant"><br>
<input class="form-input" type="text" name='length' placeholder="length"><br>

<input class="form-input" type="text" name='Diameter' placeholder="Diameter"><br>
<input class="form-input" type="text" name='Height' placeholder="Height"><br>
<input class="form-input" type="text" name='Whole weight' placeholder="Whole weight"><br>
<input class="form-input" type="text" name='Shucked-weight' placeholder="whole weight"><br>
<input class="form-input" type="text" name='vicera weight' placeholder="vicera weight"><br>
<input class="form-input" type="text" name='shell weight' placeholder="shell weight"><br>


    <center><input type="PREDICT" class="logbtn" value="Predict"></center>
<divclass="bor"><center><b><fontcolor="white"size=5>{{showcase}}</font></b></center></div></form>
</body>
</html>
```

Resultnew.html

```html
<html>
<style>
.idiv{
width:60%;
margin:auto;
background-color:black;
text-align:center;
margin-top:2%;
border-radius:10px;
background-image:url("");
background-repeat: no-repeat;

margin-top:2%;
}
body{
background-color:black;
font-family:segoe ui;
background:lineargradient(rgba(0,0,0,0.8),rgba(0,0,0,0.8)),url(https://as2.ftcdn.net/v2/
jpg/01/16/98/39/1000_F_116983952_nl6aYaBuC8pVZbCJnTOhgT3rkVYpP3y3.jpg);
height: 100vh;
 -webkit-background-size: cover;
  background-size: cover;
  position: relative;

}
input{
font-size:1.3em;
width:80%;
text-align:center;
}
input placeholder{
```

```css
        text-align:center;
        }
        button{
        outline:0;
        border:0;
        background-color:darkred;
        color:white;
        width:100px;
        height:40px;
        }
        button:hover{
        background-color:brown;
        border:solid 1px black;
        }
        h1{
        color:red;
        }
        h2{
        color:olive;
        font-size:16;

        }
        h3{
        color:olive;
        font-size:22;
        }
        </style>
        <head>
        <title>-- Predicting Age of Abalone -- </title>
        </head>
        <body>
        <div class='idiv'>

        <br/>
```

```
<h1>Abalone Age Prediction</h1>
<h2><i>A machine learning web application using flask</i><h2>
<br/>
<h3>{{prediction_text}} </h3>


<br/>
<br/>
<br/>
</div>


</body>
</html>
```