An Internship Report

On

“Detection of freshness of fish using mobile camera”

By

Mahajan Ritu Yuvaraj

TE-IT39

Under the mentorship of

Prof. Dr. Ajitkumar Shitole

Department of Information Technology

International Institute of Information Technology, Hinjewadi, Pune

Academic Year 2021-22

SAVITRIBAI PHULE PUNE UNIVERSITY, Pune

International Institute of Information Technology
DEPARTMENT OF INFORMATION TECHNOLOGY

CERTIFICATE

This is to certify that an internship work is carried out on

"Detection of freshness of fish using mobile camera"

Submitted by :-
Mahajan Ritu Yuvaraj
T.E-IT 39

Is a internship work carried out by _Mahajan_ Ritu_ Y._ under the mentorship of Prof. _Dr. Ajitkumar Shitole_ and it is submitted towards partial fulfillment of the requirement of Savitribai Phule Pune University, Pune, for the award of the degree of Bachelor of Engineering (Information Technology)

Prof. Ajitkumar Shitole Affiliation of mentor	Prof.Bhawana K. Information Technology	Dr. Deepak SU Internship Coordinator Information Technology

Dr. Jyoti Surve
Head of Department Information Technology

Place:- Pune

Date:-

Acknowledgement

With immense pleasure, I am presenting this report on internship work on **" Detection of freshness of fish using mobile camera"** as a part of the curriculum of T.E. Information Technology at INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY, HINJEWADI, PUNE. It gives me proud privilege to complete this report work under the valuable metorship of Prof.__Bhawana K_. I am also extremely grateful to Dr. Jyoti Surve (H.O.D of Information Technology) and Dr . Vaishali Patil, Principal, Information Technology of Information Technology for providing all facilities and help for smooth progress of report work.

I would also like to thank all the Staff Members of Information Technology Department, Management, friends, and my family members, who have directly or indirectly guided and helped me for the preparation of this Report and gave me an unending support right from the stage the idea was conceived

Signature

Mahajan Ritu Y.

T.E-IT 39

List of Figures

Acronym

Acronym	Full Form
ML	Machine Learning
DS	Data Science
CNN	Convolutional Neural Network

Contents

Provide Company Background Information

Kshiti Cleantech Private Limited is a Private incorporated on 01 August 2011. It is classified as Non-govt company and is registered at Registrar of Companies, Pune. Its authorized share capital is Rs. 100,000 and its paid up capital is Rs. 100,000. It is inolved in Business activities Kshiti Cleantech Private Limited's Annual General Meeting (AGM) was last held on 30 November 2021 and as per records from Ministry of Corporate Affairs (MCA), its balance sheet was last filed on 31 March 2021.
Directors of Kshiti Cleantech Private Limited are Nikita Prasad Vaidya, Pradnya Sandeep Deshpande,
Kshiti Cleantech Private Limited's Corporate Identification Number is (CIN) U74900PN2011PTC140320 and its registration number is 140320

.Its Email address is pradnyasdesh@gmail.com and its registered address is OFFICE NO-104 SWAMIPURAM C-BUILDING, 2160 B,SADASHIV PETH PUNE-411030 PUNE Pune MH 411030 IN.

Current status of Kshiti Cleantech Private Limited is - Active.

Company Details

CIN	U74900PN2011PTC140320
Company Name	KSHITI CLEANTECH PRIVATE LIMITED
Company Status	Active
RoC	RoC-Pune
Registration Number	140320
Company Category	Company limited by Shares
Company Sub Category	Non-govt company
Class of Company	Private
Date of Incorporation	01 August 2011
Age of Company	10 years, 9 month, 11 days
Activity	Business activities n.e.c. Click here to see other companies involved in same activity.

Introduction to domain

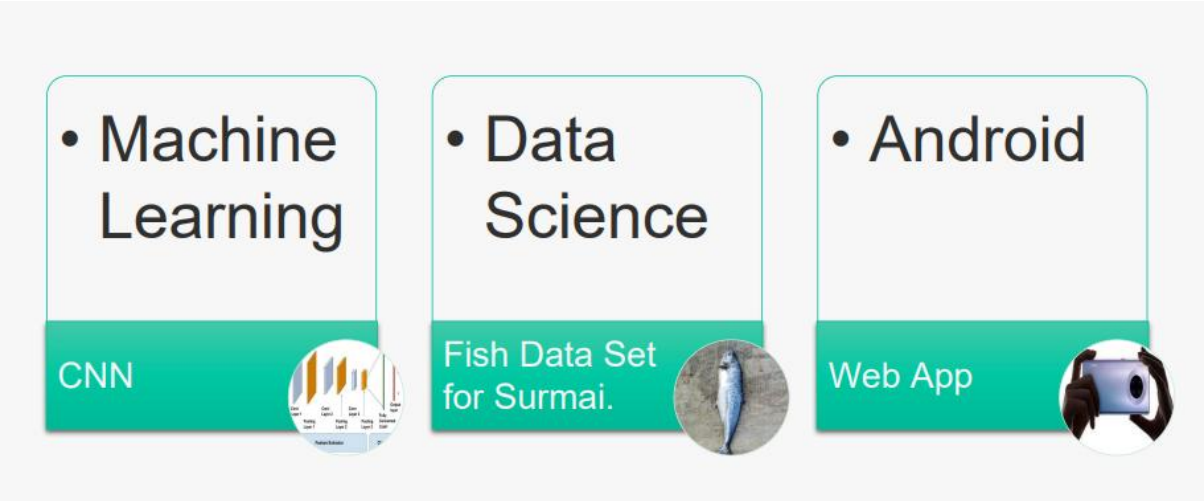


Fig 1: Domain Introduction

Machine Learning:

Computer vision, the field concerning machines being able to understand images and videos, is one of the hottest topics in the tech industry. Robotics, self-driving cars, and facial recognition all rely on computer vision to work. At the core of computer vision is *image recognition*, the task of recognizing what an image represents.

Before performing any task related to images, it is almost always necessary to first process the images to make them more suitable as input data. In this article I will focus on image processing, specifically how we can convert images from JPEG or PNG files to usable data for our neural networks. Then, in other articles I will concentrate on the implementation of classic Convolutional Neural Network

CNN:

A machine learning algorithm for machines to understand the features of the image with foresight and remember the features to guess whether the name of the new image is fed to the machine

Libraries Required :

- TFLearn – Deep learning library featuring a higher-level API for TensorFlow used to create layers of our CNN
- tqdm – Instantly make your loops show a smart progress meter, just for simple designing sake
- numpy – To process the image matrices
- open-cv – To process the image like converting them to grayscale and etc.
- os – To access the file system to read the image from the train and test directory from our machines
- random – To shuffle the data to overcome the biasing
- matplotlib – To display the result of our predictive outcome.
- tensorflow – Just to use the tensorboard to compare the loss and adam curve our result data or obtained log.

Data Science:

A data set is a collection of numbers or values that relate to a particular subject. For example, the test scores of each student in a particular class is a data set. The number of fish eaten by each dolphin at an aquarium is a data set.

Data set is the collection of 40 fish images which includes clear visuals of Eyes and Skin of fishes that are Surmai Species.

Android app Development:

Steps:

1. Search https://developer.android.com/studio

2. Install Android Studio

4. Task: Explore the layout editor

5. Task: Add color resources

6. Task: Add views and constraints

7. Task: Update the appearance of the buttons and the TextView

8. Task: Make your app interactive

9. Task: Implement the second fragment

Give details of work responsibilities during the internship

- **Collected Images Of Fishes.**

Fig 2: fish Images

- **Created the data set.**

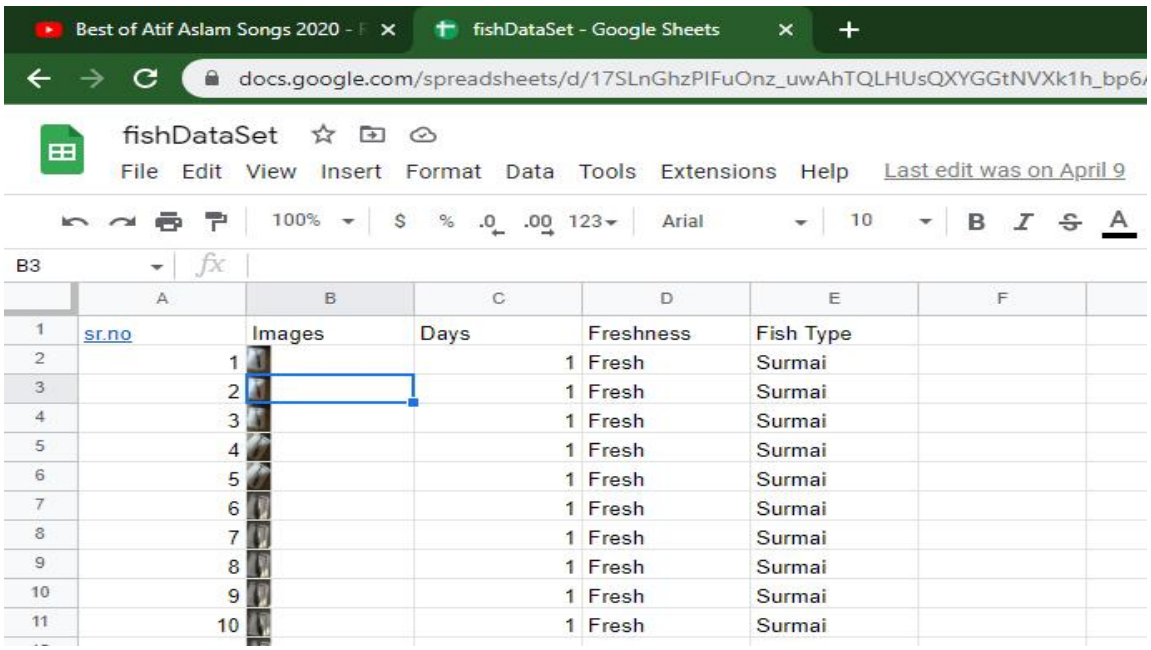


Fig 3.Dataset

• Collected research Papers .

- Fish Identification and freshness classification through Image Processing using Artificial Neural Network.

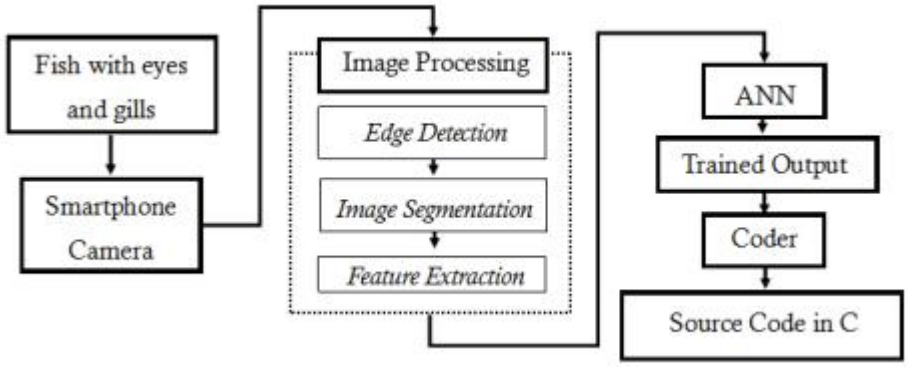


Fig 4. Research Paper Model

- A low-cost imaging framework for freshness evaluation from multifocal fish tissues.

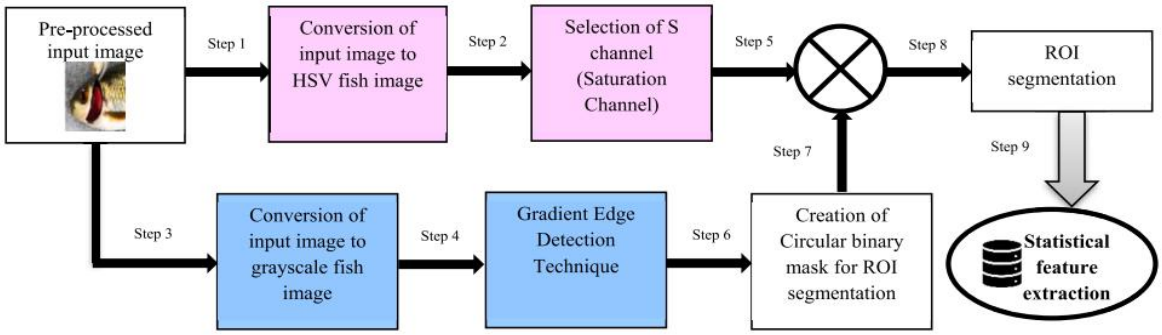


Fig. 6. Stepwise illustration for automatic segmentation of eye focal tissue.

Fig 5. Research Paper Model

• Design and implementation of fish freshness detection algorithm using deep learning

Predicted class

Actual class		yes	no	Total
	yes	TP	FN	P
	no	FP	TN	N
	Total	P'	N'	P + N

Fig 6. Research Paper Model

• **Developed Machine Learning Model.**

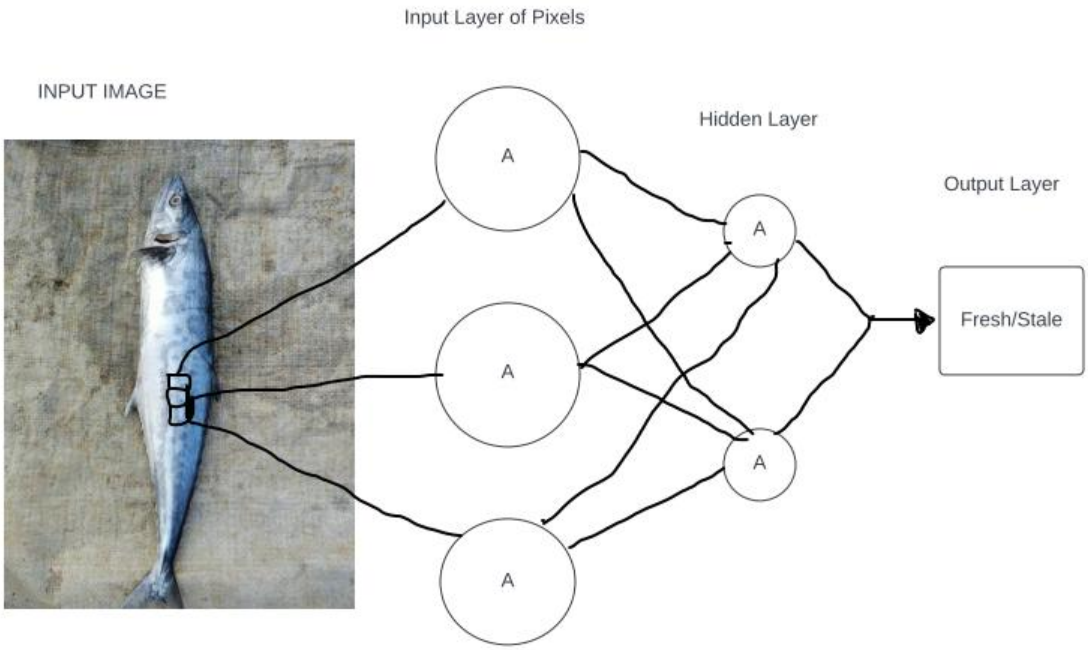


Fig 6.CNN Model

- **Developing Android App**

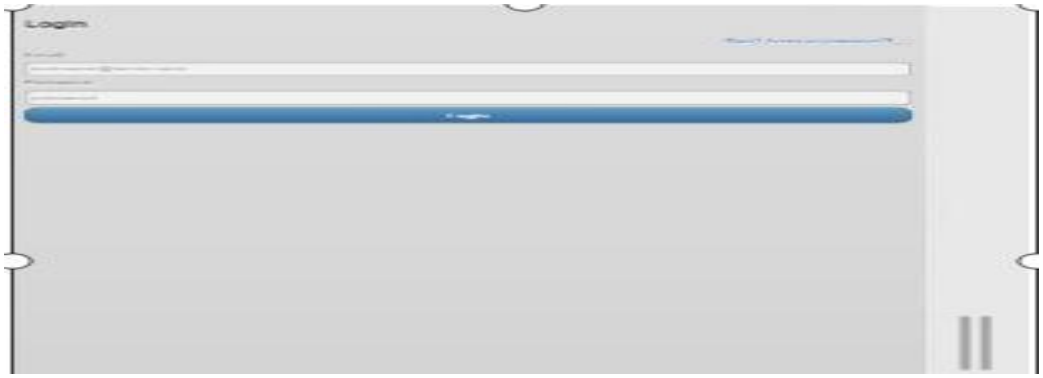


Fig 7.Login Model.

Discuss the skills learned and the experiences

1. Database Management Database Management : consists of a group of programs that can edit, index, and manipulate the database. The DBMS accepts a request made for data from an application and instructs the OS to provide specific required data. In large systems, a DBMS helps users to store and retrieve data at any given point

2. Microsoft Excel: 1. Naming and creating ranges 2. Filer, sort, merge, trim data 3. Create Pivot tables and charts 4. Clean data: remove duplicate values, change references between absolute, mixed and relative 5. Look-up required data among thousands of records

3. Probability & Statistics Data Science : Using capital processes, algorithms, or systems to extract knowledge, insights, and make informed decisions from data. In that case, making inferences, estimating, or predicting form an important part of Data Science.Probability with the help of statistical methods helps make estimates for further analysis. Statistics is mostly dependent on the theory of probability. Putting it simply, both are intertwined.

4. Android web Application.

5. Programming, Packages and Softwares : Machine Learning essentially is about programming. Programming Skills for Machine Learning brings together all the fundamental skills needed to transform raw data into actionable insights. While there is no specific rule about the selection of programming language, Python and R are the most favored ones. a list of programming languages and some packages for Data Science to choose from: 1. Python 2. R 3. SQL 4. Java 5. Julia 6. Scala 7. MATLAB 8. TensorFlow

Outcomes

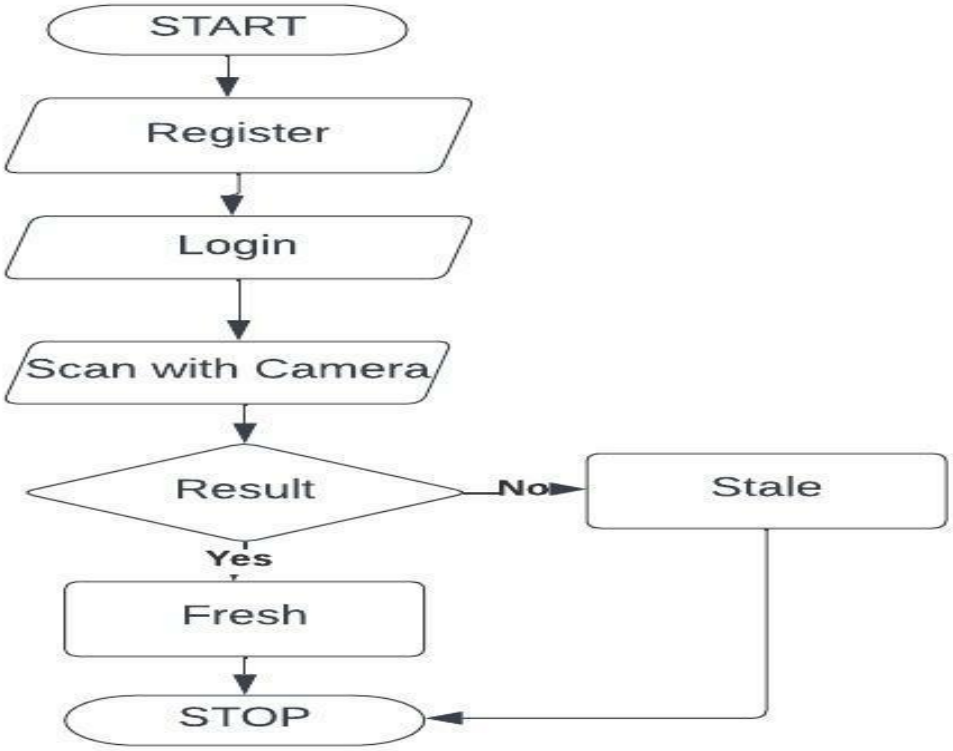


Fig8. Workflow

1. User will be go for Download and Install app

2. Go for the Registration which includes {Name, Email Id, Password,DOB }or go with start with Google.

3. Then user will be Login the app with Authentications

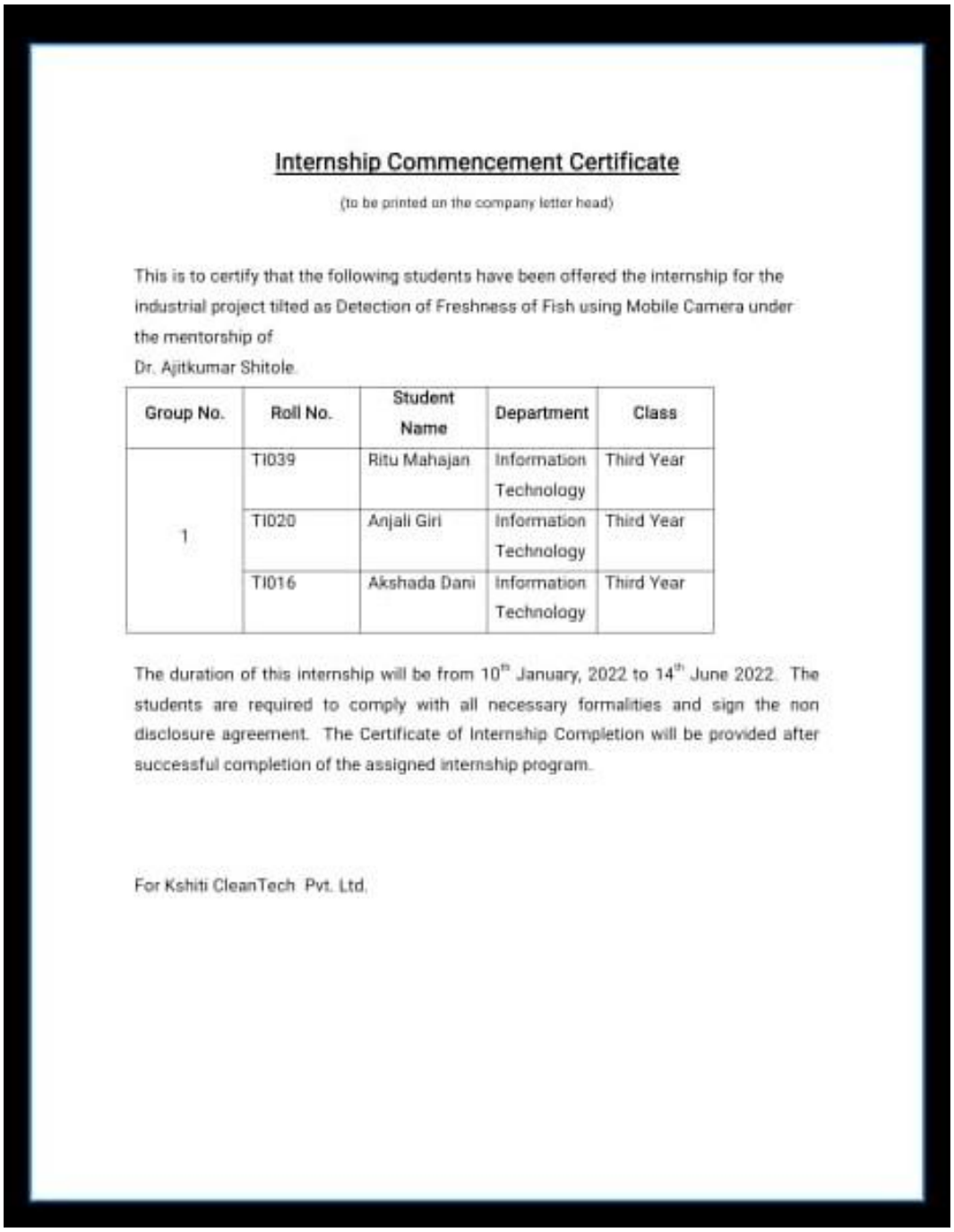
4. Go for scan the image by clicking on camera.

5. After Processing of image usng CNN Machine Learning Model, It would be Prompted That fish is fresh or stale.

Conclusion

Fish is consumed as a source of food in many regions of the world. It has rich nutrients, vitamins, minerals, and proteins. Multiple tissues of fish such as gills, eyes and skin decompose with time, which causes a drop in its freshness quality. Image processing of the app which is used to identify fish's freshness will result amount of nutritious user gets in fresh fish so there would be no stomach infection or medical complication within consumers of fish.

Appendix A: Internship Permission Letter



Internship Commencement Certificate

(to be printed on the company letter head)

This is to certify that the following students have been offered the internship for the industrial project tilted as Detection of Freshness of Fish using Mobile Camera under the mentorship of
Dr. Ajitkumar Shitole.

Group No.	Roll No.	Student Name	Department	Class
1	TI039	Ritu Mahajan	Information Technology	Third Year
	TI020	Anjali Giri	Information Technology	Third Year
	TI016	Akshada Dani	Information Technology	Third Year

The duration of this internship will be from 10th January, 2022 to 14th June 2022. The students are required to comply with all necessary formalities and sign the non disclosure agreement. The Certificate of Internship Completion will be provided after successful completion of the assigned internship program.

For Kshiti CleanTech Pvt. Ltd.

Appendix B

Weekly Work Sheet

Duration: (in weeks)

Week No.	Activity Planned	Activity Completed Status	Student Signature	Mentor Signature
Week 1	Introduction to Fish Biological Study	Overview of fish Body		
Week 2	Introduction to Fish Biological Study	Introduction to Fish Biological Study		
Week 3	Survey of Local Fish Market	Survey of Fish Market		
Week 4	Search for Research Papers	Search for Research Papers		
Week 5	Search for Research Papers	Search for Research Papers		
Week 6	Study Of Research Papers	Study Of Research Papers		
Week 7	Study Of Research Papers	Study Of Research Papers		
Week 8	Collect Fish Images	Collect Fish Images		
Week 9	Proper Cleaning and Integration of Fish Images	Proper Cleaning and Integration of Fish Image		
Week 10	Creation Of Data Set	Creation Of Data Set		
Week 11	Creation Of Data Set	Creation Of Data Set		

Week 12	Study of ML Regarding Image Processing	Study of ML Regarding Image Processing		
Week 13	Develop CNN Model for Image Processing	Develop CNN Model for Image Processing		
Week 14	Develop CNN Model for Image Processing	Develop CNN Model for Image Processing		
Week 15	Study of Android App Development	Study of Android App Development		
Week 16	Study of Android App Development	Study of Android App Development		
Week 17	Development of Android Application	Log in Model		
Week 18	Development of Android Application	Camera scanner		
Week 19	Testing of CNN Model	Testing		
Week 20				
Week 21				
Week 22				
Week 23				
Week 24				