VISVESVARAYA TECHNOLOGICAL UNIVERSITY

JNANA SANGAMA CAMPUS, BELGAVI-590018

PROJECT REPORT

On

"DETECTION OF CHEMICALLY RIPENED BANANA FRUITS BASED ON IMAGE FEATURES USING MACHINE LEARNING"

Submitted by

CHANDAN SHATRI	4AL15IS007
POOJA HEGDE	4AL15IS023
THAIZEERA AS	4AL15IS047
VISHAL NAIK N	4AL15IS049

In partial fulfillment of the requirements for the degree of

BACHELOR OF ENGINEERING

In

INFORMATION SCIENCE AND ENGINEERING

Under the Guidance of

Dr. ROOPALAKSHMI. R

Professor

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ALVAS INSTITUTE OF ENGINEERING AND TECHNOLOGY

Moodbidri-574225, Karnataka

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KARNATAKA

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

CERTIFICATE

Certified that the project work entitled "DETECTION OF CHEMICALLY RIPENED BANANA FRUITS BASED ON IMAGE FEATURES USING MACHINE LERNING" is a bonafide work carried out by

CHANDAN SHASTRI	**4AL15IS007**
POOJA HEGDE	**4AL15IS023**
THAIZEERA AS	**4AL15IS047**
VISHAL NAIK N	**4AL15IS049**

in partial fulfilment for the award of BACHELOR OF ENGINEERING in **INFORMATION SCIENCE AND ENGINEERING** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM** during the year 2018–2019. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the Bachelor of Engineering Degree.

Dr. ROOPALAKSHMI R	**Mr. JAYANTKUMAR A. RATHOD**	**Dr. PETER FERNANDES**
Project Guide	**Head of the Department**	**Principal**

Professor, Dept. of Info. Sci. & Engg. (ISE)
Alva's Institute of Engg. & Technology
Mijar, Moodbidri - 574225

H. O. D.
Dept. Of Information Science & Engineering
Alva's Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

PRINCIPAL
Alva's Institute of Engg. & Technology,
Mijar, MOODBIDRI - 574 225, D.K

Name of the Examiners	**Signature with Date**
1.	
2.	

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MIJAR, MOODBIDRI D.K. -574225

KARNATAKA

DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

DECLARATION

We,

CHANDAN SHASTRI

POOJA HEGDE

THAIZEERA AS

VISHAL NAIK N

Hereby declare that the dissertation entitled, "Detection of Chemically Ripened Banana Fruits Based on Image Features using Machine Learning" is completed and written by us under the supervision of our guide Dr. **ROOPALAKSHMI. R**, Professor, Department of Information Science and Engineering, Alva's Institute of Engineering And Technology, Moodbidri, in partial fulfilment of the requirements for the award of the degree BACHELOR OF ENGINEERING in DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING of the VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI during the academic year 2018-2019. The project report is original and it has not been submitted for any other degree in any university.

CHANDAN SHASTRI	4AL15IS007
POOJA HEGDE	4AL15IS023
THAIZEERA AS	4AL15IS047
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ABSTRACT

Fruits are one of the most nutritious as well as naturally available foods, which are generally consumed in raw form. However, in present competitive world, almost 80%fruits are ripened using hazardous chemicals such as Calcium carbide (CaC2) by greedy traders which cause serious health issues. Further, the regular consumption of fruits ripened using Calcium carbide can cause cancer due to the presence of traces of poisonous gases such as Arsenic and Phosphorous. On the other hand, in the existing literature, only less research is carried out towards identification of chemically ripened fruits using computer vision based techniques.

To solve this problem, this project proposes a new framework, which can identify the artificially ripened banana fruits by means of employing different visual features including color, shape and histograms in an integrated manner. The proposed framework is implemented on a real dataset of banana images using neural network based algorithm. The Experimental results in terms of accuracy, cross entropy and confidence level measures demonstrate the efficiency of the proposed system.