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- **19th-21st November, 2025 Conference Dates**
- **5th Septmber, 2025 Full paper submission**
- **20th October, 2025 Acceptance Notification**
- **5th November, 2025 Camera-ready copy due**
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IRTM 2024

Gmail **Prawesh Sharma <praweshsharma9091@gmail.com>**

# [IRTM 2024] Your paper #1571067702 ('A Comparative Study on HSV and LAB Colour Space: Targeting Feature Extraction from Mango Sample Image')

**irtm2024-chairs@edas.info** <irtm2024-chairs@edas.info> Tue, Nov 5, 2024 at 12:29 PM
To: Indranil Maity <indranil.maity@iem.edu.in>, Sudip Samanta <sudipsamantadetce03@gmail.com>, Prawesh Sharma <praweshsharma9091@gmail.com>

Dear Dr. Indranil Maity:

Congratulations - your paper #1571067702 ('A Comparative Study on HSV and LAB Colour Space: Targeting Feature Extraction from Mango Sample Image') for IRTM 2024 has been **accepted** and will be presented in the session titled __.

The reviews are below or can be found at 1571067702.

## IRTM 2024 1

**Comments for reviewers: write at least 100 words regarding this review**

The research addressed the problem of maturity stages in imaging using the MATLAB programming language and developing the algorithm. I think the research is good and I do not reject it, but it would be better if the MATLAB algorithm was put in a brief code for each step, and it is possible to add improvements to it in the future in this way. I recommend accepting the research.

## IRTM 2024 2

**Comments for reviewers: write at least 100 words regarding this review**

paper can be accepted

Regards,
The conference chairs

# A Comparative Study on HSV and LAB Color Space: Targeting Feature Extraction from Mango Sample Image

Indranil Maity
*Department of Electronics & Communication Engineering (ECE)*
*Institute of Engineering & Management (IEM)*
*University of Engineering & Management (UEM)*
Kolkata, India
E-mail: indrasanu026@gmail.com

Sudip Samanta
*Department of Electronics & Communication Engineering (ECE)*
*Institute of Engineering & Management (IEM)*
Kolkata, India
E-mail:
sudipsamantadetce03@gmail.com

Prawesh Sharma
*Department of Electronics & Communication Engineering (ECE)*
*Institute of Engineering & Management (IEM)*
Kolkata, India
E-mail:
praweshsharma9091@gmail.com

***Abstract*— The precise determination of fruit maturity is essential for upholding quality. Mango (Mangifera Indica) is one of the most meaningful tropical fruits, and its maturity assessment is a vital process for farmers and consumers. Conventional methods of maturity determination predominantly based on perception-focused, are subjective and inclined to inaccuracies. In this paper, a systematic approach to detect maturity stages using image processing technique which gives us an effective solution. In MATLAB, an algorithm is developed for finding different ripeness stages using HSV (Hue, Saturation and Value) and L*A*B* color space. Here, MATLAB (R2023b) is used to extract color features from different images. Each channel of HSV and L*A*B* represents different color pixels. The results indicated that L*A*B* color space provides more accuracy compared to HSV.**

***Keywords*— *Ripeness, HSV, CIE L*A*B, maturity stage.***

## I. INTRODUCTION

Mangoes are commonly known as “king of Fruits”. Mangoes are very well-known tropical fruit in the world. Production of this fruit increases steadily. The largest producer of mango is India, harvesting approximately 2.3 million hectares. India produces 21.79 million metric tons of mango each year. This represents the 50% of the world production. The economic value of mangoes is greatly affected by their appearance, highlighting the importance of effective after-harvest management. Conventional process of manually determining and sorting fruits is often less efficient and unreliable, especially when handling large number of mangoes. On the other hand, digital image processing using different computer software introduced new potentials. Our advanced method enables us to accurately assess the ripeness of mangoes. Main parameters, like maturity which is frequently analyzed by color. Human evaluation can be unreliable. This highlights the requirements for accurate and objective categorization to precisely reflect the value of mangoes. The HSV (Hue, Saturation and Value) and CIE L*A*B* color space are specifically efficient in this context, as they very close with human color perception. These two-color spaces perform as very reliable for determining the ripeness status of mangoes. By employing the HSV and L*A*B* color spaces, digital image processing can provide accurate evaluation of mango maturity and also enhance efficiency and reliability of the classification procedure.

Utilizing the color of an image is very basic and impactful process to determine the ripeness level of the fruit, demonstrating whether it is unripe, ripe or overripe [1-3]. At first, a smartphone camera is used to capture the essential image for further procedure [4]. The image is trimmed to highlight the main part. This process reduces the error caused by minor pixel clusters, specifically which appeared at the fruit edges [5]. The main challenge faced in the post-harvest period of massive fruit production is the classifying procedure essential for impactful distribution [6-7]. Color is very crucial parameter of digital image. Color is the main characteristic that we notice when an image is captured [8-10]. The maturity of fruits is generally demonstrated by its color [11].

This methodology can increase the precision of the fruit maturity classifying procedure. Multiple researches have represented the use of image processing methods for sorting fruit ripeness [12]. Systems have been established to support handlers to evaluate mango ripeness with the help of digital image processing and shape recognition. The mango images are evaluated on computer as digital images. In this field, most broadly employed method was HSV color space [13-15].

Tian et al. [16] Reviewed computer vision technology and its impact on agricultural automation, highlighting intelligent technology and its potential to improve cost-effectiveness, efficiency, and accuracy. Raghavendra et al. [17] proposed AI-based hierarchical approach for ripeness grinding of mango was evaluated against a conventional single-shot multi-class classification approach using Support Vector Machines (SVM), while Results showed that the hierarchical method, with an accuracy of 88%, outperformed the conventional approach and other existing models. Nagle et al. [18] proposed the determination of surface color of ‘all yellow’ mango using image processing to determine the ripeness of two Thai mango varieties using computer vision system (CVS), by using CIE L*A*B* and calculating a yellowness index, it showed the peel color changes during ripening and showed while L values were impacted by lighting and high accuracy were determine for A and B color parameters and shows ripeness parameters from 72%-92% for ‘Nam Dokmai’ and 98%-100% for ‘Maha Chanok’, it was shown that the CVS was capable of producing accurate color values for the two mangos.

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