# [VISVESVARAYA TECHNOLOGICAL UNIVERSITY](http://www.vtu.ac.in/)

**“JNANA SANGAMA” , BELAGAVI-590018, KARNATAKA**



**Project Report On**

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***“QUALITY ANALYSIS AND SHELF-LIFE PREDICTION OF FRUITS USING DEEP LEARNING FOR***

***AUTOMATED STORAGE SORTING”***

**Submitted in the partial fulfillment of the requirement for the award of degree of**

**BACHELOR OF ENGINEERING**

**In**

***COMPUTER SCIENCE AND ENGINEERING***

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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

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## SAI VIDYA INSTITUTE OF TECHNOLOGY

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**RAJANUKUNTE, BENGALURU – 560 064 2021-22**S

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**CERTIFICATE**

Certified that the Project Work Phase-2 (18CSP83) work entitled *“****QUALITY ANALYSIS AND SHELF-LIFE PREDICTION OF FRUITS USING DEEP LEARNING FOR AUTOMATED STORAGE SORTING****”* carried out by **Ms. Vaishnavi(1VA18CS053), Mr. Santhosh K(1VA18CS039), Mr. Suhas M(1VA18CS048), Mr. Tejas Manu S(1VA18CS052),** bonafide students of **SAI VIDYA INSTITUTE OF TECHNOLOGY**, Bengaluru, in partial fulfillment for the award of Bachelor of Engineering in Computer Science and Engineering of **VISVESVARAYA TECHNOLOGICAL UNIVERSITY**, Belagavi during the year **2021-22.** 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 said Degree.

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# ABSTRACT

Transfer Learning, on the contrary, is a machine learning approach that utilizes a previously trained machine learning model to produce a new model that is used to tackle a distinct but interrelated problem. When a smaller data set is available and computational capacity is limited, using a pre-trained machine learning model to generate a new model is more efficient way to approach the problem.

In our implementation we will be employing a machine learning model MobileNetV1 that is pre-trained with Image- Net database .In addition to this will also be Fine-Tuning our model, where we will be freezing the initial layers of the model except the last 5 layers and re-training the model to classify the images based on the new data with a very low learning rate to detect the quality of fruits and vegetables.

Image classification plays a vital part in the detection and segregation of fruits for their quality by considering parameters such as color, shape, deformation and scabs We compare two techniques, and Transfer Learning, to develop a model that can do these tasks quickly and efficiently. With an accuracy of 92.66, the technique requires a large data set, as well as a lot of computing power, GPU, and time. When given a small data set, low computing resources, and a GPU, transfer learning performs better, with an accuracy of 95.42 in substantially less time. By evaluating the model, we can affirm that a combination of Transfer Learning with fine tuning enhances the performance of the classification model.

**Keywords**: Fruits, quality ,image classifier,shelf life.

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