A

Minor Project

On

**INTRINSIC IMAGE DECOMPOSITION**

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BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE AND ENGINEERING

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## **UGC AUTONOMOUS**

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**ABSTRACT:**

Image understanding and analysis is one of the important tasks in the image processing. Multiple factors influence the appearance of an object in an image. However, extracting the intrinsic images from the observer image can eliminate the environmental impact effectively and make the image understanding more accurately. The intrinsic images represent the inherent shape, color and texture information of the object. Intrinsic image decomposition is recovering shading image and reflectance image from a single input image and remains a challenging problem because of its severely ill-posed problem. In order to deal with these problems, researches have proposed various algorithms for decomposing the intrinsic image. In this paper we survey the recent advances in intrinsic image decomposition. First, we introduce the existing datasets for intrinsic image decomposition. Second, we introduce and analyze the existing intrinsic image decomposition algorithms. Finally, we use the existing algorithms to experiment on the intrinsic image datasets, and analyze and summarize the experimental results.

EXISTING SYSTEM:

Intrinsic image decomposition methods which compute shading and reflectance components are briefly reviewed in this section. We divide the methods into three categories, Retinex-based methods, global sparsity assumption methods, and methods that use additional information other than the 2D image.

Implementation steps of our approach are depicted in Fig 1. First, a smooth version of the input image was obtained via structure preserving image smoothing. Then, the smooth version of the image was used for intrinsic decomposition, and the shading and reflectance components were extracted. In the final stage, the texture information was added to either the shading or the reflectance component based on the material of each pixel.

DISADVANTAGES:

* In contrast to regression and multi-class classification, some studies approach age estimation as an ordinal ranking problem. For instance, presents a deep (category-based) ranking model that combines deep scattering transform and ordinal ranking.
* Formulates the problem as ordinal regression using a series of binary classification tasks which are jointly optimized by a multiple output CNN architecture.

PROPOSED SYSTEM:

This paper proposes a new framework for intrinsic image decomposition. Our approach applies several steps in order to obtain high quality shading and reflectance components from a single image. The approach is based on the assumption that regions with smooth intensity variations share the same material properties and have the same reflectance. Thus, the reflectance of a pixel can be obtained as a weighted function of a connected set of pixels (Ω) with similar intensity values. To find Ω for an input pixel, region growing was applied to ensure that Ω is connected and any change of intensity is smooth. To avoid ambiguity caused by texture, we treat texture differently from the preceding methods. Texture details were removed from the image and the smooth image was processed for intrinsic decomposition. Texture details were added to the reflectance or shading components based on the material of each pixel in the final stage. To evaluate the performance of our method qualitatively, the algorithm was tested on several natural-scene images to demonstrate the advantages of the proposed method. For quantitative evaluation, the MIT intrinsic dataset was considered and the results were compared with results of methods tested on this dataset.

ADVANTAGES:

HARDWARE REQUIREMENTS:

**System :** intel core i3

**Hard Disk :** 1 TB

**Monitor :** 14’ colour monitor

**Mouse :** optical mouse

**RAM :** 4gb

SOFTWARE REQUIREMENTS:

**Operating System :** windows 10

**Coding Language :** Python

**Front-End :** Python IDE (version 3.7.4), Pycharm

CONCLUSION:

In this paper, to address the problem of intrinsic image decomposition, we have proposed two new sparse priors on reflectance: a data-driven sparse representation of reflectance and a global sparse constraint on reflectance colors. Combining the two sparse priors, we can effectively decompose a single image into its intrinsic components. A sparse representation is made possible by using data-dependent weighted wavelets constructed based on the local sparsity constraint on reflectance. At the same time, the constructed weighted wavelet also preserves chromaticity distribution even at coarse scales. By using a multi-resolution representation of reflectance and applying reflectance weighting to enforce the sparsity constraint at multiple scales, we can convert what appears to be a local constraint into a global constraint. We also apply a global assumption that the number of different reflectance colors in the image is small through the use of a total-variations-like cost term. The decomposition problem is formulated as a constrained 1-norm minimization problem, and the proposed approach seeks to recover the sparse reflectance signal given smoothness constraints on the illumination component. We also discussed the color bleeding problem in the decomposition with the proposed method.