

Method for Quantitative Digital Color Imaging of Objects

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BACKGROUND

In many disciplines, quantitative measurements of color are required to evaluate nondestructively the state of an object (e.g., quality of produce). This characterization is typically performed using contact point measurement devices. A limitation of these devices is that multiple measurements are required to characterize an entire object; if multiple objects must be characterized, then this process may be time consuming. Furthermore, these devices interrogate both superficial and deeper structures in the object, and do not possess the ability to discriminate between these structures.

TECHNOLOGY DESCRIPTION

University of California researchers have developed a method for acquiring and analyzing polarization sensitive digital color images of objects. Polarization optics provide the user with the ability to discriminate between superficial and deeper structures in an object. Various linear transformations can be applied to the images to obtain information in alternate color spaces; this can be tailored to the specific colors of interest. For studies in which multiple color measurements are required over a relatively long period of time, the researchers have developed a device to position the object in a repeatable fashion, allowing for absolute color comparisons to be drawn among measurement sessions.

APPLICATIONS

One successful application of this method has been for quantitative characterization of melanin and erythema content in skin. Other potential applications include (but are not limited to) the following. In the food industry, this method can be used to evaluate the effect of freeze-thaw cycles on food, quantify food quality during preparation, characterize the quality of meats for grading, measure the color of grain to assess quality, and study environmental effects on produce. In dermatology, the method can be used to quantify effects of ultraviolet radiation on skin, characterize skin irritation due to topical drug application, evaluate the color and/or potential irritation induced by cosmetics, quantify the efficacy of sunscreens, determine the efficacy of therapies of various skin conditions (e.g., psoriasis, nonmelanoma skin cancer), evaluate the irritation caused by baby wipes, and quantify the effects of anesthesia on skin perfusion. Other fields in which such a method can be used include soil chemistry, biomaterials testing, horticulture, and textiles.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	7,400,754	07/15/2008	2003-408

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OTHER INFORMATION

CATEGORIZED AS

- » **Optics and Photonics**
 - » All Optics and Photonics
- » **Agriculture & Animal Science**
 - » Processing and Packaging
- » **Medical**
 - » Diagnostics
 - » Disease: Dermatology
 - » Imaging
 - » Screening

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