Machine Vision Lighting Tips for Overdriving LEDs Cheat Sheet

by [deleted] via cheatography.com/2754/cs/9385/

Introduction

Lighting is a vital element of an optimized inspection using machine vision. Even the best camera can capture what it can see, and the best image processing software relies on good results from the camera. Illumination consistency, intensity, and resolution will have an effect on the final accuracy of an application. Despite this, lighting historically has not been an integrated part of a machine vision system.

A fundamental element of a successful and effective vision system is the visibility of the target object to be inspected, especially the specific objectives for an inspection: missing parts, color differentiation, blemishes, character recognition, or sizing, for example. The starting point for the quality of these source images is the suitability and effectiveness of the lighting for a machine vision system to perform consistently. The primary images need to be consistent, making undefinable variations in lighting unacceptable..

Credit: http://www.controleng.com/single-article/machine-vision-lighting-tips-for-overdriving-leds/bd38934ee1887bf01452570b98ca5-295.html

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Five LED overdriving tips

Most machine vision applications are short of light, so overdriving light-emitting diodes (LEDs) is a common practice–it allows users to increase intensity from LED lights for a short, defined, period of time (with up to 1,000% overdriving capability). However, LED overdriving limits are based on generalized parameters that are considered safe for all LEDs so are usually set lower than is possible in reality for a specific light.

1. Ensure generation of maximum brightness

Ensure generation of maximum brightness from a light. This is achieved by having data readily available on the actual light being used, therefore enabling the overdriving of a particular light to its safe optimized limits.

2. Calibrate lighting brightness

Calibrate lighting brightness to allow more repeatability of lighting intensity.

3. Set thresholds

Set thresholds and feature detection to be more sensitive, while maintaining good repeatability and reliability of detection

4. Use actual temperatures

Overdrive limits also are based on the maximum operating temperature, but most lights run at a lower temperature. So, by measuring the actual temperature of the light, it is possible to allow for more overdrive in systems which run below the maximum temperature.

5. Pay attention to timing

Some systems need to capture many images of each product item in a sequence of varying lighting requirements. With application-level visibility of the timing of the system, and a fully featured lighting controller, such systems are easier to set up, monitor, and maintain.