

Reviews For Paper

Paper ID 912

Title Fast, Simple, Accurate Illuminant Estimation

Masked Reviewer ID: Assigned_Reviewer_13

Review:

Question	
Paper Summary. Please summarize the paper in your own words.	This work aims to estimate the illumination chromaticity of an image in a manner that is fast, simple and accurate, which are properties important for white balancing onboard a camera. Using simple features known to be useful for illumination estimation, ensembles of multivariate regression trees are fitted with single-feature decision boundaries. This approach essentially extends the method in [10] by employing multivariate regression trees that predict the illumination chromaticity values jointly (rather than univariate regression trees that estimate the values independently) and that are trained with a distance measure more appropriate for white balancing.
Paper Strengths.	The paper clearly explains the shortcomings of [10] and presents a solution that effectively addresses these issues. It makes sense to account for the fact that the chromaticity values are correlated and constrained. Also, Example 1 nicely illustrates that a squared-error loss function does not accurately reflect distance measures proposed for white balancing.
Paper Weaknesses.	This work is heavily based on [10]. It could be argued that the extensions are incremental.
Overall Rating. Try to avoid choosing "Borderline."	Accept
Overall Evaluation. Please convey to the authors, the Area Chair, and to fellow reviewers, how	Although I would not consider the presented extensions of [10] to be huge, they are nicely motivated and lead to appreciable improvements in performance over [10]. The accuracy is comparable to a top CNN method [33] while being relatively simple and much faster. Such a technique is of practical significance for mobile phone imaging, and I would favor acceptance.

<p>you decided your Overall Rating. Good ideas need a reviewer to champion their paper, and bad papers need constructive criticism. What key things would you like the authors to include in their rebuttal?</p>	
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Masked Reviewer ID: Assigned_Reviewer_3

Review:

Question	
<p>Paper Summary. Please summarize the paper in your own words.</p>	<p>This paper presents a method for estimating illumination from features known to be predictive in illuminant estimation for based on an ensemble of multivariate regression trees.</p>
<p>Paper Strengths.</p>	<p>The use of multivariate regression trees for illuminant estimation instead of univariate regression trees used in [3] is new.</p>
<p>Paper Weaknesses.</p>	<p>The idea of training an ensemble of decision trees on simple features that can accurately predict the chromaticity of the illumination was proposed by Cheng et al [10]. This paper extends Cheng et al's idea to the case of multivariate regression trees, where each tree predicts multiple responses. Considering the contributions of Cheng et al's work, the extension and improvements reported in the paper is marginal, and experimental evaluation is not sufficient.</p>
<p>Overall Rating. Try to avoid choosing "Borderline."</p>	<p>Weak Reject</p>
<p>Overall Evaluation. Please convey to the authors, the</p>	<p>The idea of training an ensemble of decision trees on simple features that can accurately predict the chromaticity of the illumination was proposed by Cheng et al [10]. This paper extends Cheng's idea to multivariate regression trees, where each tree predicts multiple responses without</p>

<p>Area Chair, and to fellow reviewers, how you decided your Overall Rating. Good ideas need a reviewer to champion their paper, and bad papers need constructive criticism. What key things would you like the authors to include in their rebuttal?</p>	<p>providing theoretical reasoning why the use multivariate regression trees is suitable for illuminant estimation. Considering the contributions of Cheng et al's work, the extension and improvements reported in the paper is marginal, and experimental evaluation is not sufficient.</p>
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Masked Reviewer ID: Assigned_Reviewer_7

Review:

Question	
<p>Paper Summary. Please summarize the paper in your own words.</p>	<p>This paper proposes a method for illuminant color estimation for white balancing. The proposed method is based on Cheng [10] using univariate regression trees, and extends it by using multivariate regression trees [12]. While [10] predicts r and g values independently, the proposed method simultaneously predicts r, g, and b values and can deal with various distance measures other than L2. The performance of the proposed method is compared with [10] and [33] by using public datasets.</p>
<p>Paper Strengths.</p>	<p>The extension from univariate regression trees to multivariate regression trees is reasonable. The experimental results show that the proposed method works better than [10] in terms of most error indices, and performs comparable to a CNN-based method [33].</p>
<p>Paper Weaknesses.</p>	<p>I have two concerns. First, the application scenario of the proposed method is limited compared with conventional methods for white balancing such as the gray-world assumption. This is because the proposed method has to build a regression model for a particular camera rather than any cameras and images. In addition, the proposed method would not work well for images in most formats other than RAW, even though they are captured by using the same camera. Second, the novelty of the proposed method is relatively limited. The extension from</p>

	<p>univariate regression to multivariate regression would be rather straightforward, and the multivariate regression trees itself has already been proposed [12].</p> <p>The followings are minor comments. I am curious about the computational time required for the offline training of the proposed method. It would be better to investigate the performance of the proposed method when images captured by other cameras or in other formats are used for testing.</p>
<p>Overall Rating. Try to avoid choosing "Borderline."</p>	<p>Weak Reject</p>
<p>Overall Evaluation. Please convey to the authors, the Area Chair, and to fellow reviewers, how you decided your Overall Rating. Good ideas need a reviewer to champion their paper, and bad papers need constructive criticism. What key things would you like the authors to include in their rebuttal?</p>	<p>The extension from univariate regression to multivariate regression is firm. Unfortunately, however, I hesitate to recommend the acceptance of this paper, because the application scenario of the proposed method is limited as described at Weaknesses. In addition, the novelty of the proposed method is not necessarily high.</p>