

Author's Accepted Manuscript

Enhanced Dynamic Range X-ray Imaging

Mark A. Haidekker, Logan Dain-kelley Morrison,
Ajay Sharma, Emily Burke



PII: S0010-4825(17)30020-3
DOI: <http://dx.doi.org/10.1016/j.combiomed.2017.01.014>
Reference: CBM2586

To appear in: *Computers in Biology and Medicine*

Received date: 23 June 2016
Revised date: 18 January 2017
Accepted date: 23 January 2017

Cite this article as: Mark A. Haidekker, Logan Dain-kelley Morrison, Ajay Sharma and Emily Burke, Enhanced Dynamic Range X-ray Imaging, *Computer in Biology and Medicine*, <http://dx.doi.org/10.1016/j.combiomed.2017.01.014>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and a review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain

Enhanced Dynamic Range X-ray Imaging

Mark A. Haidekker^{a,*}, Logan Dain-kelley Morrison^a, Ajay Sharma^b, Emily Burke^b

^a*University of Georgia
College of Engineering
Driftmier Engineering Center
597 D.W. Brooks Drive
Athens, GA 30602-4435, USA
Phone: 706-542-1653
Fax: 706-542-8806*

^b*University of Georgia
College of Veterinary Medicine*

Abstract

X-ray images can suffer from excess contrast. Often, image exposure is chosen to visually optimize the region of interest, but at the expense of over- and underexposed regions elsewhere in the image. When image values are interpreted quantitatively as projected absorption, both over- and underexposure leads to the loss of quantitative information. We propose to combine multiple exposures into a composite that uses only pixels from those exposures in which they are neither under- nor overexposed. The composite image is created in analogy to visible-light high dynamic range photography. We present the mathematical framework for the recovery of absorbance from such composite images and demonstrate the method with biological and non-biological samples. We also show with an aluminum step-wedge that accurate recovery

*Corresponding author

Email address: mhaidekk@uga.edu (Mark A. Haidekker)

Download English Version:

<https://daneshyari.com/en/article/4964921>

Download Persian Version:

<https://daneshyari.com/article/4964921>

[Daneshyari.com](https://daneshyari.com)