



# The Art and Science of HDR Imaging

By John J. McCann, Alessandro Rizzi

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**The Art and Science of HDR Imaging** By John J. McCann, Alessandro Rizzi

Rendering High Dynamic Range (HDR) scenes on media with limited dynamic range began in the Renaissance whereby painters, then photographers, learned to use low-range spatial techniques to synthesize appearances, rather than to reproduce accurately the light from scenes. *The Art and Science of HDR Imaging* presents a unique scientific HDR approach derived from artists' understanding of painting, emphasizing spatial information in electronic imaging.

Human visual appearance and reproduction rendition of the HDR world requires spatial-image processing to overcome the veiling glare limits of optical imaging, in eyes and in cameras. Illustrated in full colour throughout, including examples of fine-art paintings, HDR photography, and multiple exposure scenes; this book uses techniques to study the HDR properties of entire scenes, and measures the range of light of scenes and the range that cameras capture. It describes how electronic image processing has been used to render HDR scenes since 1967, and examines the great variety of HDR algorithms used today. Showing how spatial processes can mimic vision, and render scenes as artists do, the book also:

- Gives the history of HDR from artists' spatial techniques to scientific image processing
- Measures and describes the limits of HDR scenes, HDR camera images, and the range of HDR appearances
- Offers a unique review of the entire family of Retinex image processing algorithms
- Describes the considerable overlap of HDR and Color Constancy: two sides of the same coin
- Explains the advantages of algorithms that replicate human vision in the processing of HDR scenes
- Provides extensive data to test algorithms and models of vision on an accompanying website

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## The Art and Science of HDR Imaging By John J. McCann, Alessandro Rizzi Bibliography

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## **Editorial Review**

### **Review**

“Overall, this book provides an excellent overview of the history of imaging, HDR imaging algorithms, and the abilities of the human visual system. The book is a great achievement for the authors, and it will be well appreciated by anyone who enjoys learning about a field from the key players. Most importantly, it will encourage the reader to think about how visual processing works, and how that process can serve as a model for imaging systems for HDR images.” (*Journal of Electronic Imaging*, 1 September 2012)

### **From the Back Cover**

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#### **Jimmy Hicks:**

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