

A Continuously Differentiable Mesopic Observer Model for Just-Noticeable Differences in Luminance

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ABSTRACT

A common problem with Just-Noticeable Differences (JND) models is their often discontinuous, much less smooth, nature when evaluated over high dynamic range. A survey of the literature focused around just-noticeable differences in color and luminance shows that one of the most fundamental aspects of this problem is the transition through mesopic vision and its effects on color perception. To that end, a procedure for the synthesis of a continuously differentiable threshold luminance versus adaptation luminance function for the mesopic observer from standard models within the literature is derived and shown to be tractable for real-time rendering applications.

BIO

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Caleb Klapp is an interdisciplinary software engineer who has been with FlightSafety International, Simulation - Visual Systems in St. Louis, MO since September 2010. He received a M.S. in Physics from Missouri University of Science & Technology in 2008, followed by an M.S. in Computer Science from University of Missouri-St. Louis in 2014. He is involved with most aspects of the visual simulation system with a particular focus on research and development in real-time rendering, color management, and image processing, as well as sensor and display system characterization.