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**Granger**

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(54) **IMAGE TRANSFORMATION SYSTEM AND METHOD**

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**H04N 1/60** (2006.01)

(52) **U.S. Cl.**  
CPC ..... **H04N 1/603** (2013.01); **H04N 1/6005** (2013.01); **H04N 1/6016** (2013.01); **H04N 1/6058** (2013.01)

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See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

8,319,790 B2 11/2012 Ho et al.  
2006/0164662 A1 7/2006 Tin

2009/0022395 A1 \* 1/2009 Cho ..... H04N 1/6027 382/167  
2009/0040564 A1 2/2009 Granger  
2011/0157212 A1 6/2011 Zhang et al.  
2012/0308133 A1 \* 12/2012 Kim ..... H04N 1/6005 382/167  
2016/0005349 A1 1/2016 Atkins et al.  
2016/0323556 A1 11/2016 Luginbuhl et al.  
2018/0013927 A1 \* 1/2018 Atkins ..... H04N 1/6005

**OTHER PUBLICATIONS**

International Search Report and Written Opinion received for PCT Application Serial No. PCT/US2021/051780 dated Dec. 23, 2021, 16 pages.

\* cited by examiner

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(57) **ABSTRACT**

An image reproduction system and methods for providing colorant data to an end device. A method includes extracting general HSV value data for each pixel of an image from image data. For each pixel, the general HSV value data is transformed to generate universal perceived brightness, Bp, and universal perceived-chroma, Cp, value data. End-device colorant data associated with the general HSV value data is retrieved for each pixel and scaled using the Bp and Cp value data to obtain scaled end-device colorant data. The scaled end-device colorant data is transmitted to the end device.

**19 Claims, 12 Drawing Sheets**  
**(5 of 12 Drawing Sheet(s) Filed in Color)**

