

## Preface

We welcome you to the proceedings of CCIW 2017, the Computational Color Imaging Workshop, held in Milan, Italy, during March 29–31, 2017.

This sixth CCIW was organized by the University of Milan-Bicocca, with the endorsement of the International Association for Pattern Recognition (IAPR), the Gruppo Italiano Ricercatori in Pattern Recognition (GIRPR), and the Gruppo del Colore (GdC).

The aim of the workshop was to bring together engineers and scientists of various imaging companies and research laboratories from all over the world, to discuss diverse aspects of their latest work, ranging from theoretical developments to practical applications in the field of color imaging, as well as color image processing and analysis.

Since the First Computational Color Imaging Workshop organized in 2007 in Modena, Italy, CCIW has been an inspiration for researches and practitioners in the fields of digital imaging, multimedia, visual communications, computer vision, and consumer electronics who are interested in the fundamentals of color image processing and its emerging applications.

For CCIW 2017 there were many excellent submissions of high scientific level. Each paper was peer reviewed by at least two reviewers. Only the 20 best papers were selected for presentation at the workshop. The final decision for the paper selection was based on the criticisms and recommendations of the reviewers, and the content relevance of papers to the goals of the workshop. In addition to the submitted papers, four distinguished researchers were invited to this sixth CCIW to present keynote speeches.

In this 6th Computational Color Imaging Workshop, challenging issues and open problems not sufficiently addressed in the state of the art were addressed. In the following, we summarize issues and problems that were covered by the papers accepted for CCIW 2017, the invited speeches, and the tutorials.

CCIW 2017 started on March 29, 2017, with four tutorials:

- Material Appearance by S. Tominaga
- Color Texture Analysis and Classification by F. Bianconi, C. Cusano, and P. Napoletano
- Review of Systems Coupling Multispectral Imaging and 3D Imaging by A. Treneau
- Color Vision Is a Spatial Process: The Retinex Theory by M. Lecca [11]

The three invited talks were hosted over the next two days:

- On Gloss and the Appearance of Color by A. Gijsenij
- Fourier Multispectral Imaging: Measuring Spectra, One Sinusoid at a Time by K. Hirakawa [6]
- Computational Print Control by J. Morovic [14]

In the Color Image Processing session, S. Yamaguchi et al. [22] presented a method for smoke removal based on a smoke imaging model and a space-time pixel compensation. E. Provenzi [17] presented the similarities and differences in the mathematical formalizations of the Retinex models and its variants. M. Lecca et al. [12] presented a new Milano Retinex implementation, based on an intensity thresholding strategy.

In the Color Image Quality session, B. Ortiz-Jaramillo et al. [16] presented a software for image fidelity assessment. S. Corchs and F. Gasparini [4] presented a multidistortion database to be used for image quality assessment, and G. Ciocca et al. [3] presented an image analysis based on image complexity to investigate interference between distortions and image contents in image quality assessment.

In the Color in Digital Cultural Heritage session, J.A. Toque et al. [19] presented a method for the visualization of subsurface features in oil paintings using a combination of high-resolution visible and near-infrared scanned images. K. Yoshida et al. [23] presented a scanner for high-resolution imaging of wall paintings. M. Tsuchida et al. [20] presented a technique for visualizing lost design of degraded early modern tapestry using infrared images. R. Kanai et al. [7] presented a novel scanning technique for imaging of gold and silver foils used in art works. T. Komiyama et al. [9] presented a transmission type scanning system to be used for ultra high-resolution scanning. T. Vitorino et al. [21] showed the importance of hyperspectral imaging applied to the investigation of paintings.

In the Spectral Imaging session, P. Lapray et al. [10] presented a database of spectral filter array images that combine both visible and near-infrared bands. H.A. Khan et al. [8] presented an analytical survey of highlight detection in color and spectral images.

In the Color Characterization session, M. Hebert et al. [5] presented a method for the characterization of structural color prints by hyperspectral imaging and hypercolor gamut estimation. S. Mazauric et al. [13] presented a fast calibration reflectance-transmittance model to compute multiview recto-verso prints. J.-B. Thomas et al. [18] presented the use of an image contrast measure as a gloss material descriptor.

In the Color Image Analysis session, S. Bianco et al. [1] presented the recognition of artistic photo filtering using Convolutional Neural Networks. P. Napoletano [15] presented a comparison between hand-crafted and learned descriptors for color texture classification. F. Bianconi et al. [2] presented an improved opponent-color local binary patterns for color texture classification.

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Simone Bianco  
Raimondo Schettini  
Shoji Tominaga  
Alain Trémeau

## References

1. Simone Bianco, Claudio Cusano, and Raimondo Schettini. Artistic photo filtering recognition using cnns. *Proceedings of the 6th International Workshop CCIW 2017*.
2. Francesco Bianconi, Raquel Bello-Cerezo, Paolo Napoletano, and Francesco Di Maria. Improved opponent colour local binary patterns for colour texture classification. *Proceedings of the 6th International Workshop CCIW 2017*.
3. Gianluigi Ciocca, Silvia Corchs, and Francesca Gasparini. A complexity-based image analysis to investigate interference between distortions and image contents in image quality assessment. *Proceedings of the 6th International Workshop CCIW 2017*.
4. Silvia Corchs and Francesca Gasparini. A multidistortion database for image quality. *Proceedings of the 6th International Workshop CCIW 2017*.
5. Mathieu Hebert, Juan Martinez-Garcia, Thomas Houllier, Hayk Yepremian, Nicolas Crespo-Monteiro, Francis Vocanson, Alain Tremeau, and Nathalie Des-touches. Characterization by hyperspectral imaging and hypercolor gamut estimation for structural color prints. *Proceedings of the 6th International Workshop CCIW 2017*.
6. Keigo Hirakawa. Fourier multispectral imaging: Measuring spectra, one sinusoid at a time. *Proceedings of the 6th International Workshop CCIW 2017*.
7. Ryo Kanai, Ari Ide-Ektessabi, Tatsuya Komiyama, Kyohei Yoshida, Masahiro Toiya, Peng Wang, Yoshiharu Kowada, and Jay Arre Toque. A novel scanning technique for imaging of gold and silver foils used in art works. *Proceedings of the 6th International Workshop CCIW 2017*.
8. Haris Ahmad Khan, Jean Baptiste Thomas, and Jon Yngve Hardeberg. Analytical survey of highlight detection in color and spectral images. *Proceedings of the 6th International Workshop CCIW 2017*.
9. Tatsuya Komiyama, Ari Ide-Ektessabi, Daichi Tsunemichi, Peng Wang, Yusuke Isobe, Ryo Kanai, and Kyohei Yoshida. A transmission type scanning system for ultra high resolution scanning. *Proceedings of the 6th International Workshop CCIW 2017*.
10. Pierre-Jean Lapray, Jean-Baptiste Thomas, and Pierre Gouton. A database of spectral filter array images that combine visible and nir. *Proceedings of the 6th International Workshop CCIW 2017*.
11. Michela Lecca. Color vision is a spatial process: The retinex theory. *Proceedings of the 6th International Workshop CCIW 2017*.
12. Michela Lecca, Carla Maria Modena, and Alessandro Rizzi. T-rex: A milano retinex implementation based on intensity thresholding. *Proceedings of the 6th International Workshop CCIW 2017*.
13. Serge Mazauric, Thierry Fournel, and Mathieu Hebert. Fast-calibration reflectance-transmittance model to compute multiview recto-verso prints. *Proceedings of the 6th International Workshop CCIW 2017*.

14. Jan Morovic, Peter Morovic, Jordi Arnabat, Xavier Farina, Hector Gomez, Joan Enric Garcia, and Pere Gasparin. Computational print control. *Proceedings of the 6th International Workshop CCIW 2017*.
15. Paolo Napoletano. Hand-crafted vs learned descriptors for color texture classification. *Proceedings of the 6th International Workshop CCIW 2017*.
16. Benhur Ortiz-Jaramillo, Ljiljana Platisa, and Wilfried Philips. ifas: Image fidelity assessment software. *Proceedings of the 6th International Workshop CCIW 2017*.
17. Edoardo Provenzi. Similarities and differences in the mathematical formalizations of the retinex model and its variants. *Proceedings of the 6th International Workshop CCIW 2017*.
18. Jean-Baptiste Thomas, Jon Yngve Hardeberg, and Gabriele Simone. Image contrast measure as a gloss material descriptor. *Proceedings of the 6th International Workshop CCIW 2017*.
19. Jay Arre Toque, Koji Okumura, Yashuhide Shimbata, and Ari Ide-Ektessabi. Visualization of subsurface features in oil paintings using high-resolution visible and near infrared scanned images. *Proceedings of the 6th International Workshop CCIW 2017*.
20. Masaru Tsuchida, Keiji Yano, Kaoru Hiramatsu, and Kunio Kashino. Visualizing lost designs of degraded early modern tapestry using infra-red image. *Proceedings of the 6th International Workshop CCIW 2017*.
21. Tatiana Vitorino, Andrea Casini, Costanza Cucci, Marcello Picollo, and Lorenzo Stefani. When it is not only about color: the importance of hyperspectral imaging applied to the investigation of paintings. *Proceedings of the 6th International Workshop CCIW 2017*.
22. Shiori Yamaguchi, Keita Hirai, and Takahiko Horiuchi. Video smoke removal based on smoke imaging model and space-time pixel compensation. *Proceedings of the 6th International Workshop CCIW 2017*.
23. Kyohei Yoshida, Peng Wang, Ryo Kanai, Tatsuya Komiyama, Masahiro Toiya, and Ari Ide. A simple scanner for high resolution imaging of wall paintings. *Proceedings of the 6th International Workshop CCIW 2017*.

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