

Retinex at 50

Introduction

From the Retinex at 50 chairs:

Edwin Land's Retinex theory proposed a model of human color vision based on color perception experiments. The original Retinex algorithm is capable of performing color correction and contrast enhancement of images. Since then there have been many additions and variations of spatial models of human vision.

This workshop aims to provide the attendants with a novel look at the Retinex theory of color vision, seeing its contributions in a different light and showing the potential for applications to problems in image processing and computer graphics such as color constancy, contrast enhancement, haze removal, tone mapping of high dynamic range images, gamut reduction / extension for cinema, and color transfer.

In particular, this workshop provides an interactive author's forum to discuss the goals of different Retinex calculations, and the best way to evaluate the definition and degrees of success of our algorithms.

This workshop is a joint session from the collaboration between Color Imaging XXI: Displaying, Processing, Hardcopy, and Applications and Human Vision and Electronic Imaging (HVEI) 2016 Conferences. We appreciate the help and cooperation of their chairs.

—Alessandro Rizzi, Marcelo Bertalmio, John McCann

Symposium Chairs: Choon-Woo Kim, Inha University (Korea, the Republic of), Nitin Sampat, Rochester Institute of Technology (United States)

Symposium Short Course Chairs: Majid Rabbani, Eastman Kodak Co. (United States), Mohamed-Chaker Larabi, University of Poitiers (France)

At-large Conference Chair Representative: Adnan Alattar, Digimarc (United States)

Local Liaison Chair: Joyce Farrell, Stanford University (United States)

Exhibit and Sponsorship Chair: Kevin Matherson, Microsoft Corp. (United States)

Past Symposium Chair: Sheila Hemami, Northeastern University (United States)

Conference Chairs: John J. McCann, McCann Imaging (United States), Marcelo Bertalmio, Universitat Pompeu Fabra (Spain), Alessandro Rizzi, Università Degli Studi di Milano (Italy)

Retinex at 50 Organizing chairs: Jan Allebach, Purdue University (United States), Vien Cheung, University of Leeds (United Kingdom), Scott Daly, Dolby Laboratories, Inc. (United States), Philip Green, Gjøvik University College (Norway), Roger Hersch, École Polytechnique Fédérale de Lausanne (Switzerland), Choon-Woo Kim, Inha University (Korea, Republic of), Michael Kriss, MAK Consultants (United States), Fritz Lebowsky, STMicroelectronics (France), Nathan Moroney, Hewlett-Packard Laboratories (United States), Carinna Parraman, University of the West of England (United Kingdom), Marius Pedersen, Gjøvik University College (Norway), Shoji Tominaga, Chiba University (Japan), Stephen Westland, University of Leeds (United Kingdom)

These proceedings are part of the Color Imaging XXI: Displaying, Processing, Hardcopy, and Applications Conference: Reiner Eschbach, National University of Science and Technology (Norway) / Monroe Community College (United States), Gabriel Marcu, Apple Inc. (United States), Alessandro Rizzi, Università Degli Studi di Milano (Italy)

and the Human Vision and Electronic Imaging (HVEI) 2016 Conference: Bernice Rogowitz, Visual Perspectives (United States), Thrasylvoulos Pappas, Northwestern University (United States), Huib de Ridder, Technische Universiteit Delft (Netherlands)

Color Imaging XXI: Displaying, Processing, Hardcopy, and Applications

Tuesday, February 16, 2016

COLOR/HVEI: Retinex at 50: History Joint Session

Session Chair: Marcelo Bertalmio, Universitat Pompeu Fabra (Spain)

8:50 – 10:10 am

Continental Ballroom 4

This session is jointly sponsored by: Color Imaging XXI: Displaying, Processing, Hardcopy, and Applications, and Human Vision and Electronic Imaging (HVEI) 2016.

8:50 RETINEX-017

Retinexes algorithms: Many spatial processes used to solve many different problems (Invited), *John McCann, McCann Imaging (USA)*

9:30 RETINEX-018

Designator Retinex, Milano Retinex and the locality issue (Invited), *Alessandro Rizzi, Università degli Studi di Milano (Italy)*

10:10 – 10:50 am Coffee Break

COLOR/HVEI: Retinex at 50: Spatial Algorithms Joint Session

Session Chair: John McCann, McCann Imaging (USA)

10:50 am – 12:30 pm

Continental Ballroom 4

This session is jointly sponsored by: Color Imaging XXI: Displaying, Processing, Hardcopy, and Applications, and Human Vision and Electronic Imaging (HVEI) 2016.

10:50 RETINEX-019

The oriented difference of Gaussians model of brightness perception (Invited), *Mark McCourt and Barbara Blakeslee, North Dakota State University (USA)*

11:10 RETINEX-020

A center-surround framework for spatial image processing, *Vassilios Vonikakis, Advanced Digital Sciences Center (ADSC) (Singapore)*

11:30 RETINEX-021

Retinex-like computations in human lightness perception and their possible realization in visual cortex (Invited), *Michael Rudd, University of Washington (USA)*

11:50 RETINEX-022

The role of lightness perception in determining the perceived contrast of real world scenes (Invited), *David Kane and Marcelo Bertalmio, Universitat Pompeu Fabra (Spain)*

12:10 RETINEX-023

Processing astro photographs using Retinex based methods (Invited), *Daniele Marini, Alessandro Rizzi, and Cristian Bonanomi, Università degli Studi di Milano (Italy)*

12:30 – 2:00 pm Lunch Break

El 2016 Tuesday Plenary and Symposium Awards

Session Chair: Nitin Sampat (Rochester Institute of Technology)

2:00 – 3:00 PM

Continental Ballroom 5

Pushing computational photography deeper into imaging system design, *Ren Ng, University of California, Berkeley (USA)*

3:00 – 3:30 pm Coffee Break

RETINEX at 50: Image Processing

Session Chair: Alessandro Rizzi, Università degli Studi di Milano (Italy)

3:30 – 5:30 pm

Continental Ballroom 1

3:30 RETINEX-316

Connections between Retinex, neural models and variational methods (Invited), *Marcelo Bertalmio, Universitat Pompeu Fabra (Spain)*

4:10 RETINEX-317

Image processing applications through a variational perceptually-based color correction related to Retinex (Invited), *Javier Vazquez-Corral¹, Syed Waqas Zamir¹, Adrian Galdran², David Pardo³, and Marcelo Bertalmio¹; ¹Universitat Pompeu Fabra, ²Tecnalia, and ³EHU/UPV and Ikerbasque (Spain)*

4:30 RETINEX-318

A generalized white-patch model for fast color cast detection in natural images (Invited), *José Luis Lisani¹, Ana Belen Petro¹, Edoardo Provenzi², and Catalina Sbert¹; ¹Universitat des Illes Balears (Spain) and ²Université Paris Descartes (France)*

4:50 RETINEX-319

Statistical aspects of space sampling in Retinex models (Invited), *Gabriele Gianini, Università degli Studi di Milano (Italy)*

5:10

RETINEX Discussion

El 2016 Symposium Demonstration Session and Exhibit Hall

Happy Hour

5:30 – 7:00 PM

Continental Ballroom Foyer