COLOUR RESEARCH DAY
23 October 2017

UNIL | Université de Lausanne
Institut de psychologie (IP)
Cognitive and Affective Regulation Laboratory (CARLA)

$10^{30} – 11^{15}$
Géopolis – 2129

AKIRA ASANO
Kansai University, Japan

Human vision and temporal transition of colors and shapes

$13^{00} – 14^{30}$
Géopolis – 2129

SABINE SÜSSTRUNK
Swiss Federal Institute of Technology Lausanne, Switzerland

Opponent color revisited

ROGER D. HERSCH
Swiss Federal Institute of Technology Lausanne, Switzerland

Color changing metallic prints

LOÏC BABOULAZ
ARTMYN, Switzerland

From analog to digital: displaying a painting online

GIORGIA CHINAZZO
MARILYNE ANDERSEN
JAN WIENOLD
Swiss Federal Institute of Technology Lausanne, Switzerland

Temperature-colour interaction: is colour affecting people's thermal perception?

$11^{15} – 12^{00}$
Géopolis – 2129

CHIE MURAKI ASANO
Nagoya Women's University, Japan

Regional characteristics on preferences of red colors for women's KIMONO in Japan (extended talk)

$15^{00} – 16^{30}$
Géopolis – 2129

DOMICELE JONAUSKAITE
NELE DAEL & CHRISTINE MOHR
University of Lausanne, Switzerland

What are affective connotations with colour?

CHIE MURAKI ASANO
AKIRA ASANO

Regional characteristics on preferences of red colors for women's KIMONO in Japan

LEILA DRISSI DAOUDI
Swiss Federal Institute of Technology Lausanne, Switzerland

The role of one-shot learning in #TheDress

CHRISTELLE COCCO
PIERRE-YVES BRANDT
University of Lausanne, Switzerland

Attempts at interpretation of colours in children's drawings of gods

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Cognitive and Affective Regulation Laboratory (CARLA)

AKIRA ASANO
Kansai University, Japan

10³⁰ – 11¹⁵ Géo-2129

Human vision and temporal transition of colors and shapes

We have investigated relationships of visual stimuli and human behavior, especially preferences of colors and shapes shown to respondents. In this talk, the following topics are introduced: 1) We presented animations of evolving closed curves, which are regularly periodic, periodic but modulated with linear and quadratic functions, or irregular, to respondents. We measured the cardiogram of the respondents and estimated the activity of the sympathetic nervous system. The results suggest that the modulated curves attract more attention of respondents than the irregular and the simple regular ones. 2) We presented combinations of colors, some of which were temporarily transitional, i. e. one color in the combination gradually changed to another color during the appearance. We found that the impressions of the color combinations were emphasized by the transitions in some cases. The research suggests that certain temporal variations of visual stimuli can emphasize their impressions, similarly to proper temporal transitions of chords in music. Some more related topics of our researches on human vision and colors are presented.

SABINE SÜSSTRUNK
Swiss Federal Institute of Technology Lausanne, Switzerland

13⁰⁰ – 13²⁰ Géo-2129

Opponent color revisited

Opponent color representations have a long history in the arts and sciences. And yet, there is comparatively little research in computer science that explicitly models and incorporates color opponency into solving imaging tasks. A common perception is that "colors" are redundant and/or too correlated to be of any interest, or that it is too complex to deal with. In this talk I will illustrate with several applications, such as saliency and super-pixels, that considering opponent colors can significantly improve computational photography and computer vision tasks not only in image enhancement but also image ranking. We have additionally extended the concept of "color opponency" to include near-infrared for applications such as scene recognition, object segmentation, and semantic image labeling.

ROGER D. HERSCH
Swiss Federal Institute of Technology Lausanne, Switzerland

13²⁰ – 13⁴⁰ Géo-2129

Color changing metallic prints

The color of line halftones printed on a metallic substrate strongly depends on the orientation of the print. Line halftones induce an anisotropic dot gain effect. We established a color prediction model predicting the color of non-rotated and of 90 degrees in-plane rotated cross-halftones formed of superpositions of cyan, magenta and yellow line halftones. Our aim is to specify a first color before rotation and a second color after 90 degrees in plane rotation. Desired non-rotated and rotated image colors are mapped onto the sub-gamut allowing for the desired hue or chroma shift and then converted to optimal cross-halftone ink surface coverages. The resulting recolorization and decolorization framework is especially effective for creating surprising effects such as image parts whose hues change, or gray regions that become colorful. Applications include art, design and document security.

LOÏC BABOULAZ
ARTMYN, Switzerland

13⁴⁰ – 14⁰⁰ Géo-2129

From analog to digital: displaying a painting online

Paintings are highly complex visual objects made up of many different chemical elements mixed together and evolving over time. Capturing, digitising and displaying paintings online is at the core of ARTMYN mission, a startup from EPFL. In this talk, I will present briefly how light rays travel from the source to the viewer to induce the visual sensation of an object. This short analysis illustrates the many shortcomings of traditional digitising approaches using a digital picture. Thanks to advanced computational imaging algorithms, ARTMYN allows the viewer to appreciate colors in conjunction with other key visual elements such as topography, material reflectance, light position and vantage points. A collaborative study between EPFL and UNIL recently showed that such enriched multimodal way of viewing art impacts the cognitive-affective processing by enhancing both the aesthetic appreciation and the memory.

GIORGIA CHINAZZO
MARILYNE ANDERSEN & JAN WIENOLD
Swiss Federal Institute of Technology Lausanne, Switzerland

14⁰⁰ – 14²⁰ Géo-2129

Temperature-colour interaction: is colour affecting people's thermal perception?

Over the last century, a large number of studies has tried to answer to the question whether coloured stimuli could have an effect on human thermal perceptual evaluation (i.e., temperature-colour interaction). In the building research area, this effect is referred to as the "hue-heat-hypothesis" (HHH) and has gained attention due to the fascinating idea of heating and cooling with colours. After a brief digression on previous studies on HHH, this presentation focuses on two experimental studies carried out recently at LIPID, EPFL. In both studies, temperature and colour are manipulated to assess the thermal evaluation of people taking part in the experiment. In the first study, colour is changed thanks to coloured filters applied on the windows of a test room, resulting in transmitted "coloured" daylight. In the second study, projected HDR photographs of the same room are displayed in the Virtual Reality headset, to control for the variability of daylight through time of the day and weather experienced in the first study. Results of both experiments confirm that colours have an effect on thermal perceptual evaluation of people, with blue leading to a "cooler" sensation and orange to a "warmer" one.

CHIE MURAKI ASANO
Nagoya Women's University, Japan

11¹⁵ – 12⁰⁰ Géo-2129

Regional characteristics on preferences of red colors for women's KIMONO in Japan (extended talk)

We have investigated appearance properties of textiles from the viewpoint of affective sciences. The topic of this talk is an analysis of regional preferences of red colors for kimonos, which are traditional Japanese garments. Red colors are used especially for women's costumes at the wedding ceremony in Japan, and it has been said that the preferences of ceremonial red colors are region-dependent in Japan. We carried out sensory tests on color preferences using examples of traditional red colors including those used in Bingata, which is the traditional dyeing method of Okinawa, the south west islands of Japan. We have found interesting differences of preferences in Okinawa, western Japan, and eastern Japan. Some more related topics of our researches on textiles in affective sciences are presented.

DOMICELE JONAUSKAITE
NELE DAEL & CHRISTINE MOHR
University of Lausanne, Switzerland

15⁰⁰ – 15²⁰ Géo-2129

What are affective connotations with colour?

We can spend serious amounts of time searching for the right colour for particular moments, objects, and felt states. Popular communications are constantly feeding such notions, but scientific evidence lags behind. Here, we present two types of affective connotations with colour – colour preferences and colour-affect associations. Over the past years, we have gathered evidence on inter-individual differences in colour preferences (e.g., object context, gender, age) as well as tested colour-affect associations from different angles. We will discuss how colours are linked to emotions presented as words or bodily expressions, and to experienced mood. Taken together, the evidence points to a stronger effect of lightness and chroma (i.e., colour purity) than hue in affective connotations with colour.

CHIE MURAKI ASANO & AKIRA ASANO

15²⁰ – 15⁴⁰ Géo-2129

Regional characteristics on preferences of red colors for women's KIMONO in Japan

LEILA DRISSI DAOUDI
Swiss Federal Institute of Technology Lausanne, Switzerland

15⁴⁰ – 16⁰⁰ Géo-2129

The role of one-shot learning in #TheDress

The first amazing effect with #TheDress is that a large number of people perceive it as white and gold even though the true colors of the dress are black and blue. Such apparent changes in color are common in many illusions. What makes #TheDress even more interesting is that there is a bimodal split of the population in the perception of the dress's colors (white/gold vs. black/blue), contrary to most color illusions where almost all observers perceive the colors in the same illusory way. On top of this, the percept rarely switches in a given individual. What causes this phenomenon? Here, we tested the role of one-shot learning during the first presentation of the image. We show that the first percept but not the first fixation or the subsequent eye movements determines color perception, strongly arguing for a crucial role of one-shot learning in #TheDress.

CHRISTELLE COCCO
PIERRE-YVES BRANDT
University of Lausanne, Switzerland

16⁰⁰ – 16²⁰ Géo-2129

Attempts at interpretation of colours in children's drawings of gods

The interpretation of colours is a central question in our project: "children's drawings of gods". Drawings were collected in eight countries. Various hypotheses about strategies employed by children concern colours, such as: "Is there a relation between the colours and the culture of the child?", "Is yellow a crucial colour associated with this specific task?" In order to test these hypotheses, several attempts at interpretation have been conducted. According to visual and automatic (computer vision) observations, yellow seemed to be important. Thus, manual annotations were performed about the position of yellow in the drawing. Then, new computer vision algorithms were developed in order to reproduce these manual annotations. Other colours are currently studied, especially concerning the proportion of each colour employed by children according to their culture. In the future, emotional aspects associated with colours will be explored.

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