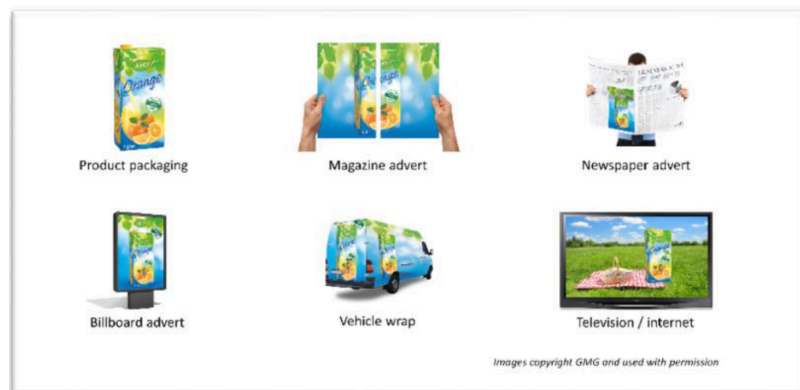# Evaluation of the closeness of the two colors (images)

〜Towards Consistent Color Appearance 〜

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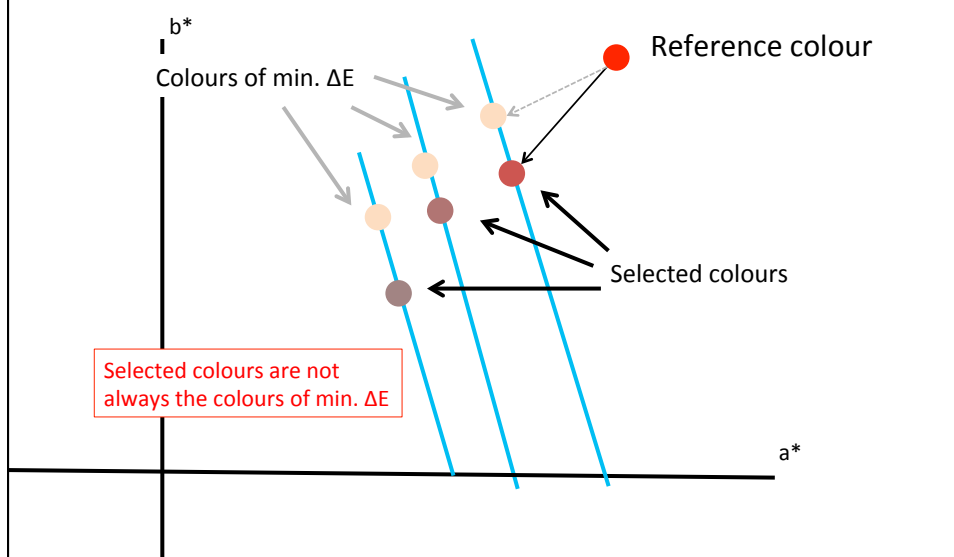

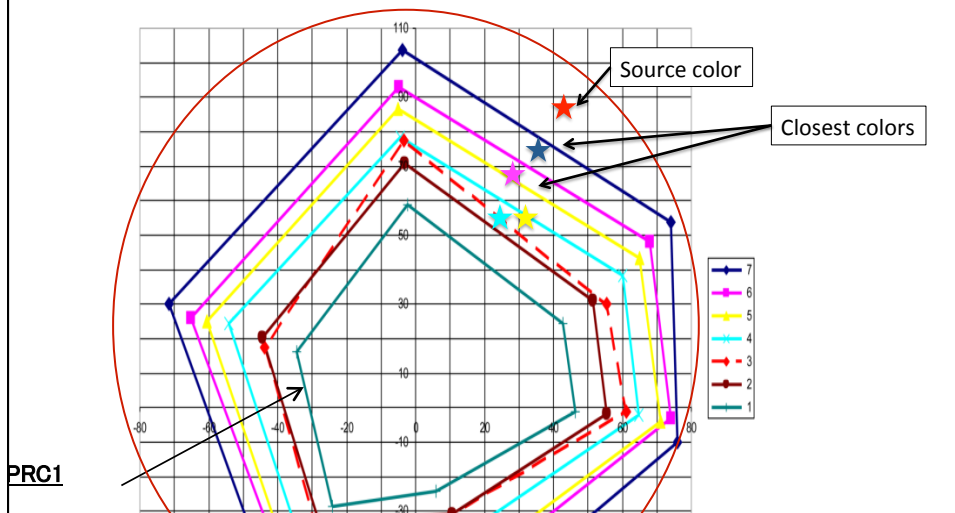## Color appearance should be consistent

Our Approach

- **Starting from color patch**

- Extending to the image?
  - direct comparison of images
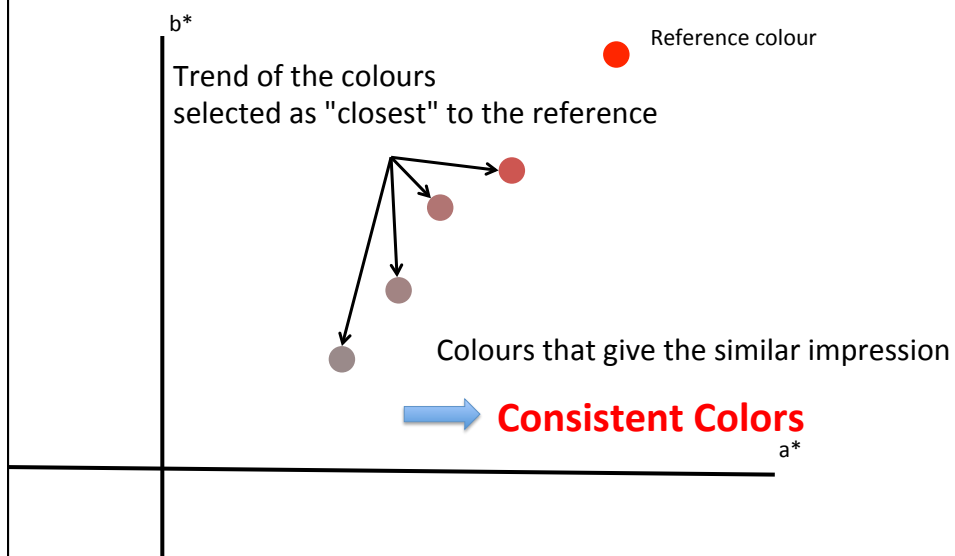 - Accumulating color information of each pixels

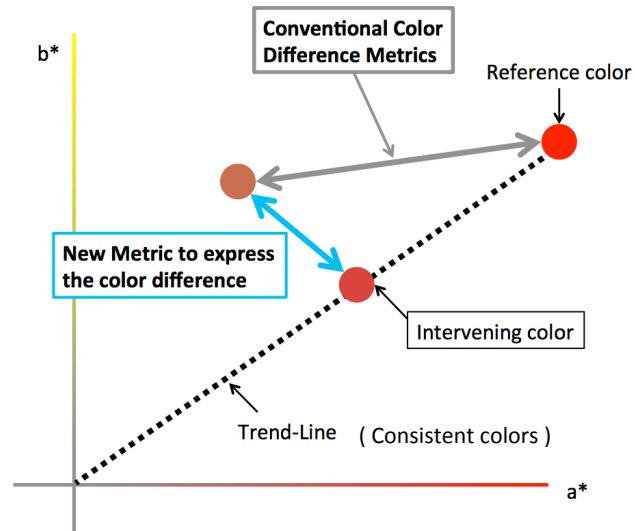# Task: "Find the closest colour on a line (e.g. equal saturation)"

b*

Colours of min. ΔE

Reference colour

Selected colours

Selected colours are not always the colours of min. ΔE

a*

When we would like to map a source color to
a color in a given gamut, we need to find
the "corresponding" color (= perceptually equal).

Source color
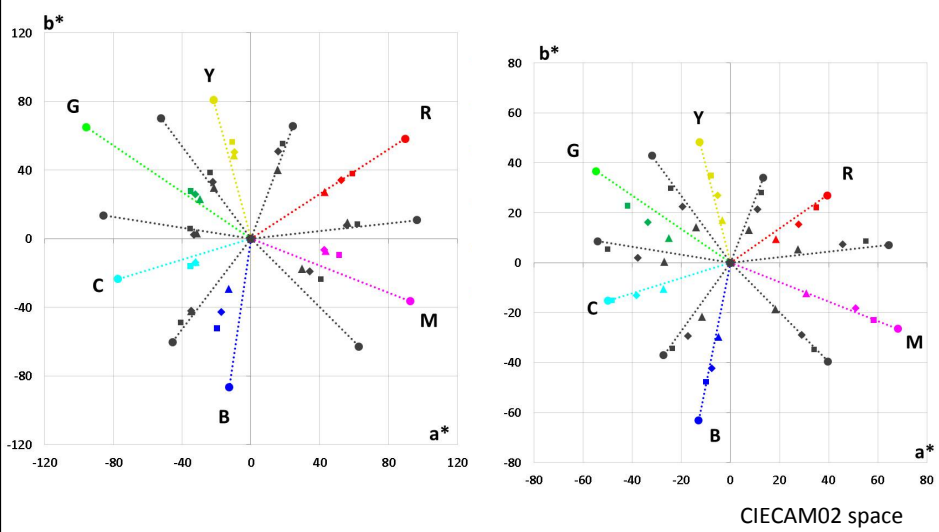
Closest colors

PRC1

After collecting several closest colours
of different gamuts:

b*

Reference colour

Trend of the colours
selected as "closest" to the reference

Colours that give the similar impression

Consistent Colors

a*

Concept of the color difference based on consistent color locus

Conventional Color Difference Metrics

Reference color

b*

New Metric to express the color difference

Intervening color

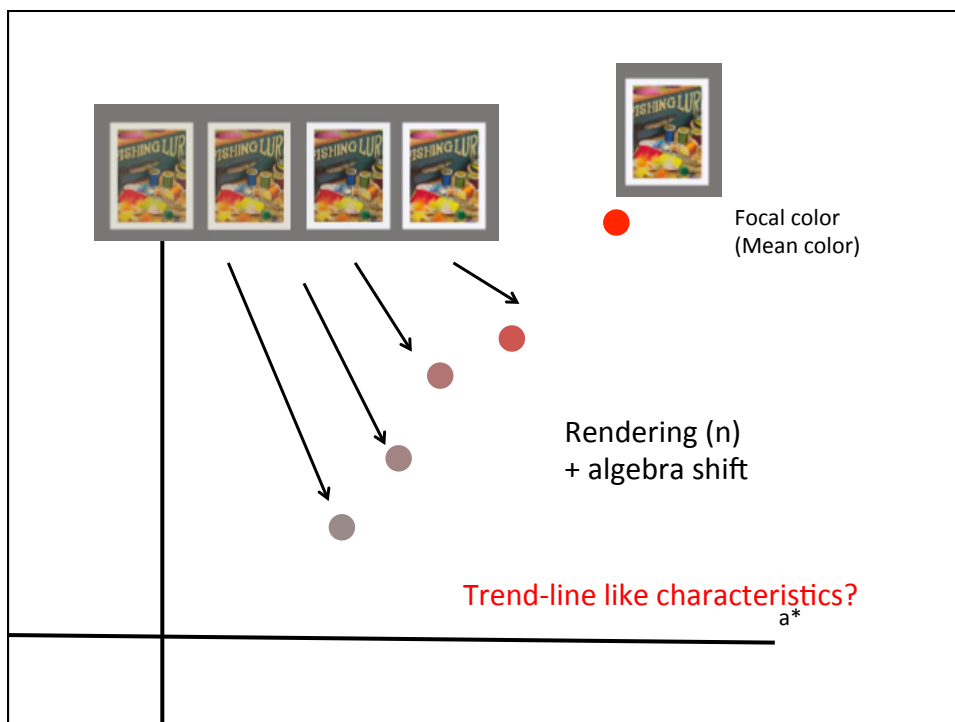Trend-Line (Consistent colors)

a*

Consistent color loci
(for CRPC7, CRPC5, and CRPC3)

CIECAM02 space

Our Approach

- Starting from color patch

- Extending to the image
    - direct comparison of images
    - Accumulating color information of each pixels

Focal color
(Mean color)

Rendering (n)
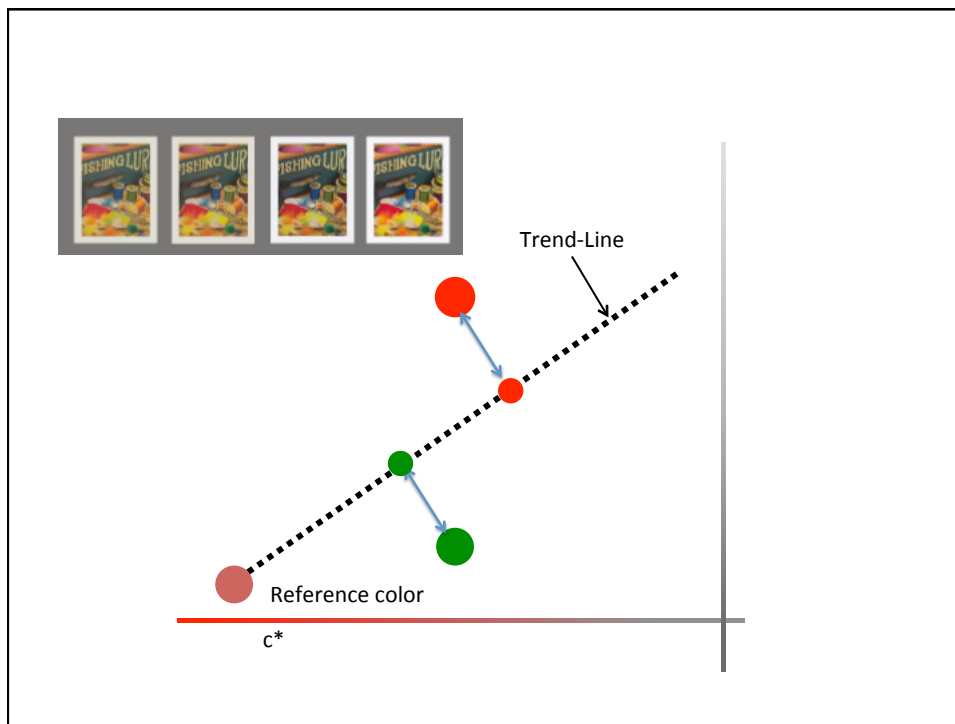+ algebra shift

Trend-line like characteristics?
a*

Image evaluations

- Original Image: AdobeRGB samples (SCID…..)
- Display D50
- Printer Gamut (3 different sizes: CRPC7, 5, 3)
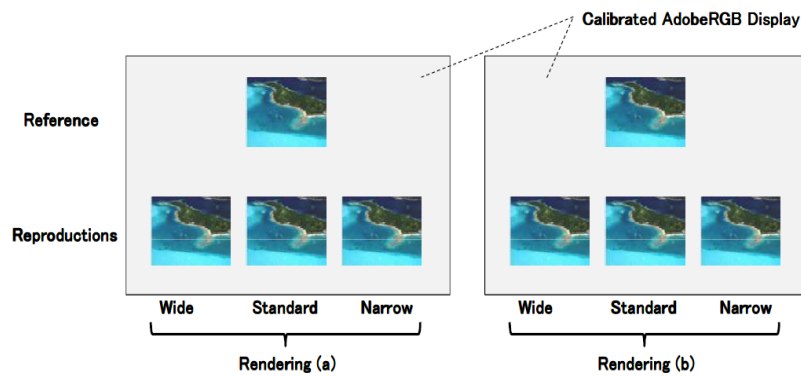- Paired comparison (Original + 3 different Gamut images)

- Several mapping method (Printer B2A)

- Color conversion
  - monitor calibration: AdobeRGB D50
  - AdobeRGB original (D65)→XYZ/Lab(D50)
  - Printer B2A(Lab→CMYK): mentioned above
  - Printer A2B(CMYK→Lab)
  - Monitor B2A(D50): AdobeRGB(D50)

Sample Images

A paired comparison evaluation

- Evaluate CCA of some renderings in paired comparison method

Compared the results if there can be correlated with trend-line results

Summary

- We conduct a paired comparison for sets of different gamut size images.
- Compared with the results with those calculated with the trend-line based color difference
- If these two results can be well correlated, then we might be able to predict the color consistency using trend-line based approach.