A color graphic icon serves the decision-making process in building design. A color graphic icon which serves the decision-making process in building design.

**CONTEXT & OBJECTIVES**

A color graphic icon which serves the decision-making process in building design.

- Based on recent developments in lighting color quality and adapted for real complex scenes.
- Providing descriptive information about the color content of a real scene and color shifts due to illuminant and/or glazing changes.

For better understanding (and predicting) preferences of people regarding tint of glazing / electric lighting according to the context.

**DEVELOPMENT OF THE ICON**

1. Application of ICAM06 color appearance model for predicting visual appearance of the complex scene and representation of the scene's color content in the PT plane of IPT color space.
2. Division of the PT plane in 18 bins (6 principal color categories divided in 3 equal parts).
3. Construction of a circular histogram to inform on scene's color distribution and calculation of mean P and T for each color category / element to inform on chroma/hues of the scene.
4. Superposition of the color content of the original scene and that distorted by a glazing/light source change.

**THE ICON STEP BY STEP**

1. The present study raises questions about:
   - Division of the color space in color categories
   - Link with color naming and memory color effect
   - Normalization of tristimulus values (Which ref. white in non-uniformly lit scenes?)
   - Parametrization (and validity) of available CAMs (color appearance models) for complex environments (Which level of chromatic adaptation?)

**APPLICATION**

**Example #1**

Hyperspectral photography
Daylighting
View through glazing
Ref = clear glazing

**Example #2**

Computer-generated image
Electric lighting
Lighting retrofitting
Ref = ID 65

**Example #3**

Two similar IES RF but the color graphic icon highlights:
- A large increase of chroma in red/orange bins with the LED source.
- A loss of chroma for the element #6 (yellow stone) with the LED source.
- Architectural elements (#1 to #6) were:
  - Less impacted than other objects
  - Less impacted by the fluorescent source than by the LED source.

**VALIDATION WORKS**

1. Objective analysis of typical colored objects
   - Some objects not in the right bin – orange-red boundary KO
2. Color content experiment
   - Some objects not in the right bin – yellow-green boundary KO
3. Context and memory color effect
4. Color listing experiment
   - 11 basic color categories instead of 6 (brown, pink, grey, white, black)
   - Berlin and Kay's basic color terms

**CONCLUSIONS**

The present study raises questions about:

- Division of the color space in color categories
- Link with color naming and memory color effect
- Normalization of tristimulus values (Which ref. white in non-uniformly lit scenes?)
- Parametrization (and validity) of available CAMs (color appearance models) for complex environments (Which level of chromatic adaptation?)

Further work:
- Re-definition of bin boundaries + validation with familiar objects in various contexts
- Objective analysis of color shift (color graphic icon) versus people's preferences

**REFERENCES**