GLOBAL GRAPHICS

CGATS SC3 TF1- Summary
Searching for a metric or
metrics to predict a print
match

CGATS SC3-TF1 Research Summary

Goals:

- Better understand the Visual Pass / Fail Criteria used when comparing press sheet to digital proof matches for systems going for certification
- Run experiments to validate hypotheses of human visual system when viewing graphic arts prints
- Find critical issues from trained observers comments when looking for Just Noticeable Differences (JND's)
- Develop a measurement based approach to predict the acceptance of two prints intended to match

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Partial List of Experiments:

- Validity of Delta E^*_{76} of 2 as JND for different printer gamuts
- Ring around sample prints shifting in one color direction in CIELAB color values against a reference
- Threshold Analysis – to investigate the number of pixels (in a cluster required for the eye to notice a color difference within an image
- Color sensitivity based on location in CIELAB color space

Note : Experiments run to determine JND's not acceptable color appearance matches

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Partial List of Experiments Continued:

- Media color differences (white point adaption)
- Down-sampling to dominate colors within images
- Contrast (Dynamic Range) variances
- Correlation of more current Delta E metrics to visual experiment data
- Impact of illuminant choice on Visual Appearance

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Results:

- Found several procedures able to predict noticeable color differences but image specific and thus not a general principle

- Found Delta E*00 a good metric for color appearance match but not able to agree on a single value for color acceptance

- Found there are thresholds for minimum pixels needed in a cluster before observed as color difference

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Results Continued:

- Found most professional print buyers noticed media color difference as being problematic at the outset

- Found more weighting needed to colors around the L* axis (neutrals) where observer experiments always noticed even very slight color differences

- Even very slight contrast changes were noticeable by observers and impacts color matching even for complex images

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Conclusions Additional:

- Illuminant Study shows actual illuminate can impact colors within an image if running a paired comparison study.

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- Tool developed to look at images and target data though intended for a different purpose perhaps would generate some ideas for the this group.

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Questions