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
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
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
Conclusions Additional:

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

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