OPTIMAL TEST CHARTS

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Which test chart to use?

Influencing Factors
- No standard test chart for color spaces
- Quality of test charts
- Effort/Time
- Cost
- Device Dependent

Purpose
- Determine the optimal number of color patches required for CMYK, RGB, and multi-color spaces
- Evaluate quality of test charts

Procedure
1. Printed and measured
2. Downscaled
3. Built models
4. Simulation
5. Compared results

Visual Procedure
Analysis

- Observed characteristics:
  - Maximum
  - Average
  - dE-00 method
  - 95th Percentile

Analysis continued…

- 95th percentile and dE-00 method:
  - Robust against noise and bad measurements
  - A typically representative value
  - Industrial standard

Results

Mathematical Formula

\[ error = \frac{k}{n^g} \]

- Variables of the formula
  - \( k \) - factor
  - \( n \) - number of patches
  - \( g \) - exponent
Results

- Common characteristics for all color spaces
- The size of the test chart does not increase exponentially by the number of process colors
- The formula seems to depend on the gamut size of the output device

Findings

- 2 main use cases:
  - Accuracy of the “fingerprint”
  - For one output system we can calculate the minimum number of patches to achieve a given quality

Use Cases

Example for GRACoL Data

- Improve test chart generators and color models
- Quality evaluation of different test charts
- Analyzing the impact of the gamut size

Further Topics

- A high quantity of color patches ≠ a better quality test chart
- Mathematical formula to calculate the required number of patches to achieve a certain dE
- Generate optimized test chart = save time and $$$

Conclusion
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