Workshop ICC/ISO130/CIE D1

Colour-difference magnitude

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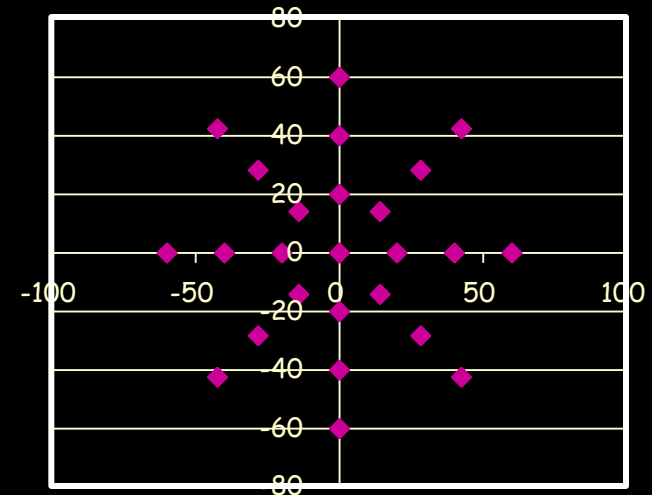
Experiment 1 - Planning

❑ 75 colour centres
- L*: 30, 50, 70
- C^*_{ab}: 0, 20, 40, 60
- h : 8 hues 45° apart from 0°.

❑ 100 samples randomly generated
surrounding each colour centre to
have the same ΔE^*_{ab} of 0.2, 3.0,
7.0, 10.0, 20.

Experiment 1 - results

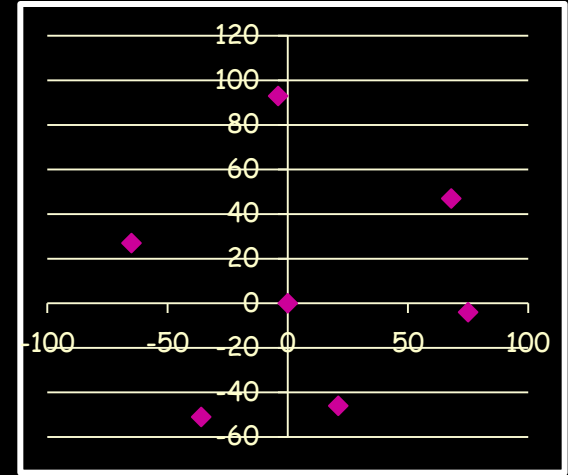| CIELAB	0.2	3	7	10	20
Mean $\Delta E_{00}/\Delta E^*$	0.68	0.68	0.67	0.67	0.67
Maximum	1.18	1.12	1.05	1.00	0.88
Minimum	0.52	0.51	0.51	0.52	0.52
Ratio	2.27	2.20	2.06	1.92	1.69
Std dev	0.13	0.12	0.11	0.11	0.09
CV	19	18	16	16	14

Experiment 2 – Planning

CAPP 2012– Haoxue Liu et al, A discussion on printing color difference tolerance by CIEDE2000, Beijing, China

❑ 7 colour centres

- L*: 18-89
- C^*_{ab} : 0-93
- h : 7 primaries

❑ 26 samples generated

surrounding each colour centre to have the same ΔE^*_{ab} of 5, which is the tolerance set for graphic art industry.

Experiment 2 - results

	K	C	M	Y	R	G	B	Total
Mean	4.86	3.04	3.13	2.45	3.26	3.18	3.17	3.30
Stdev	0.77	0.99	1.09	0.55	1.03	1.08	0.68	0.88
Upper	5.63	4.03	4.22	3.00	4.29	4.26	3.85	4.18

Tab. 4 Average CIEDE2000 color difference and standard deviation of 7 color centers

Ratio of $\Delta E_{00}/\Delta E^*_{ab}$ = 0.66 (i.e. 3.3/5.0)

Research challenges

Lighting module with the freedom of spectrum tuneability by mixing light in the way without colour shadow

Optimise the visibility of certain features by tuning the spd

Create surgical light that is integrated in the OR infrastructure

Quantify shadow measurement

Operaion luminaries with dedicated colour rendering for organs

Quantify colour rendering perception

Operation luminaries for good texture visibility

Quantify texture visibility perception

Preparation

■ *To understand the extent of appearance changes according to different parameters (illuminance, CCT, beam shape, distance, etc),*

■ *To establish methods for physical measurement, and*

■ *To investigate methods for image capturing from a digital camera.*