

NM introduced topics he wants to cover in meeting

Linear CATs

Revised chroma and saturation scales

Surround and background

Work undertaken at HP comparing CIELAB and CAM97s2 for sRGB to print found issue of white error (precision?). MF and TN concurred with this.

NM discussed field trials of proposed revisions to CIECAM – aim to simplify.

Pauli Allesi's new work in TC ?? comparing the use of CATs for comparing hard to soft copy

Adopted vs adapted white point

Admin. Stuff

RL presented work

1. Testing CAMs under different
2. New magnitude estimation data
3. CMCCAT2000
4. Proposals for CIECAM revision

1. 4 images assessed for various white points between CRT and print versions of the images. 20 observers used a category judgement method to evaluate 8 CAMs and 2 CATs. CIECAM97s best so long as average surround assumed – dim surround worse. MF suggested that surround effects for CRT seem to be relatively unimportant. NM suggested that cannot be set anyhow and discussed importance of subtense. Does that affect the judgement? Experiment to look at field of view and surrounds proposed by MF.
2. Getting new data investigating change of appearance as backgrounds, sample sizes and texture varies. Accumulating saturation data (not assessed in LUTCHI database), verifying Helm-Kohl. Effect. Testing CAMs leading to proposal that CIECAM97s needs to be modified. Size of sample affects Lightness contrast perception as background changes so CIECAM cannot be correct for all sizes.
3. CMCCAT97 problems: not reversible and approximate reverse model complex. Only derived to fit one data set. Now have 8 sets so can revisit. When we have incomplete adaptation (luminance differences between test and reference) model does not work well for McCann data set (which used high chroma sources). Model works robustly and not affected much by colour difference formula. So, CIELAB is correct measure to use. Shows that CMCCAT97 does not perform well when $p=1$. CMCCAT2000, which is simpler, performs best. Looked at use of mean and RMS as measure – no difference except that RMS introduces more weight to McCann data set. MF succeeded in linearising CAT to produce model that performs as well as Bradford and has provided it to committee. SS and GF have also achieved a matrix that provides similar results (slightly better than MF).
4. CII have developed software to optimise coefficients in CIECAM97s and suggested some improvements that give significant improvements in saturation for Grace data set (using cubes to obtain different saturation values) when compared to other proposals (MF and CAM97s2). Suggested that saturation is a very attribute important for imaging 3D objects. Suggests that Munsell samples not colour constant and have different spacing to other data sets and concludes we should not use Munsell data for CAT experiments.

NM summarised and got agreement on replacing Bradford with a linear CAT – which linear CAT needs to be agreed. MF discussed dropping McCann data in any future evaluation/optimisation (RL agreed to do this but said that differences will be small) and suggested that since there is no significant difference between the linear models he did not see how to make a choice. There was then some discussion around this choice but no firm conclusion at this time. Question as to whether would be same for images and noted that it would be good if behaved similarly to CIECAM as there is a lot of legacy using CIECAM for images. NM suggested that everyone should include the various models in their work. MF suggested that should compare images made both ways (CIECAM and linear models) to be sure but doubted if they would be very different.

So, need to set up further testing of CATs and agree D function. Discussion as to whether we should even use D for images – no real conclusion (though seems to be accepted that it should be used when comparing monitor to print images). General agreement that should leave D function as is. Discussion as to guidelines as to which value of D to use for specific imaging applications. Proposal

was to set $D=1$ to maintain device white, D not equal to 1 to maintain more of an absolute match and for multiple white points.

RL reported that TC1-52 are producing a TR which summarises the work on CATs done to date. He was concerned that their recommendation may be different to the simple linear model and that would be unfortunate. But it is using CA conditions that are more extreme than for imaging. So, agreed to watch what they are doing and possibly modify the decision on the CAT later.

Chroma scaling that gives some small value of chroma to greys when D not equal to 1. Fairchild showed results of an experiment confirming this and has suggested trying to modify the exponent for chroma in the model to improve this (will change colourfulness but does that matter?) Is it a precision issue?

Saturation scaling – should we use Luo revision? Problem of only 1 data set – MF suggests looking for more data to verify it. Also suggests that CIECAM may not keep constant chromaticity as saturation changes (which a lot of people say is the definition of saturation). RL will look at this and see whether his data conforms to this.

Lightness – should we use Luo revision? Does it match old model for small samples and mid-grey background? Need to ensure that prediction for this condition does not deteriorate.

Surround dependencies. Recommend that people use average as default, if large field of view this should over-ride surround, border may also over-ride surround.

Adopted vs adapted white point needs clarification as there is some confusion. Adopted is computational white used in an appearance model (which is normally image and/or media specific) whereas adapted is physiological white point for the viewing condition selected and will arise from psychophysical experiments.

Action items:

TN, MF & EC to establish whether 8.01 can revise CIECAM?

Tech. Report to be written defining proposed revisions and capturing them into one CAM. NM with help from MF and RL

Members to review it, evaluate the changes (and compare to CIECAM97s).

Next meeting – AIC in Rochester - Saturday June 30th? NM to talk to Paula Alessi. If not may be a video conference.