

# **Colour Management of a Display for an Individual Observer**

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# Introduction

Observer metamerism occurs because of individual cone sensitivities

In the case of displays, display colours appear different to different observers

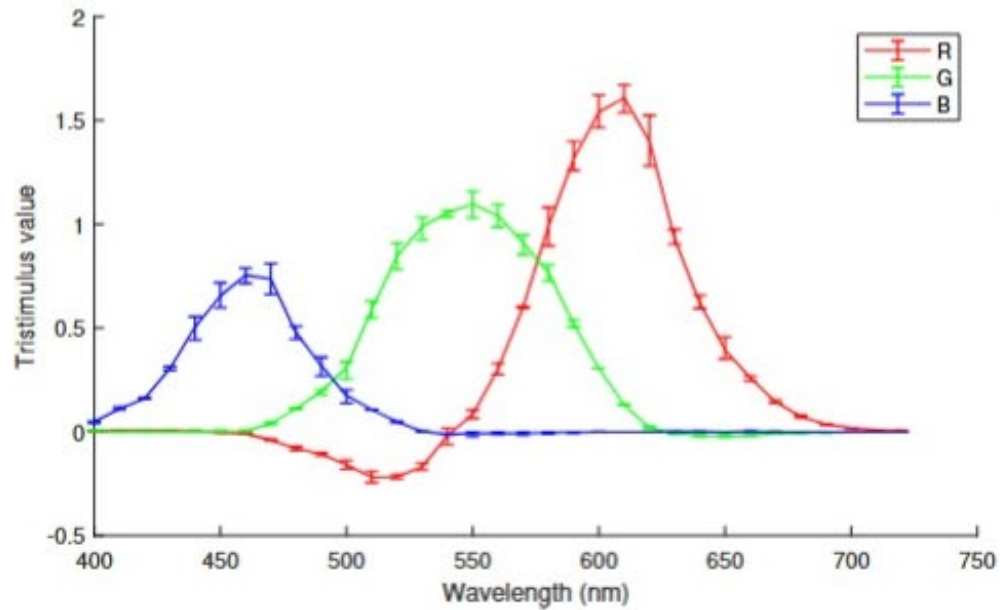
For colour management of displays taking into account colour matching functions of the observer becomes important for personalized tasks

AIM: Translate RGB colors for observers using observer-independent reference as an intermediate

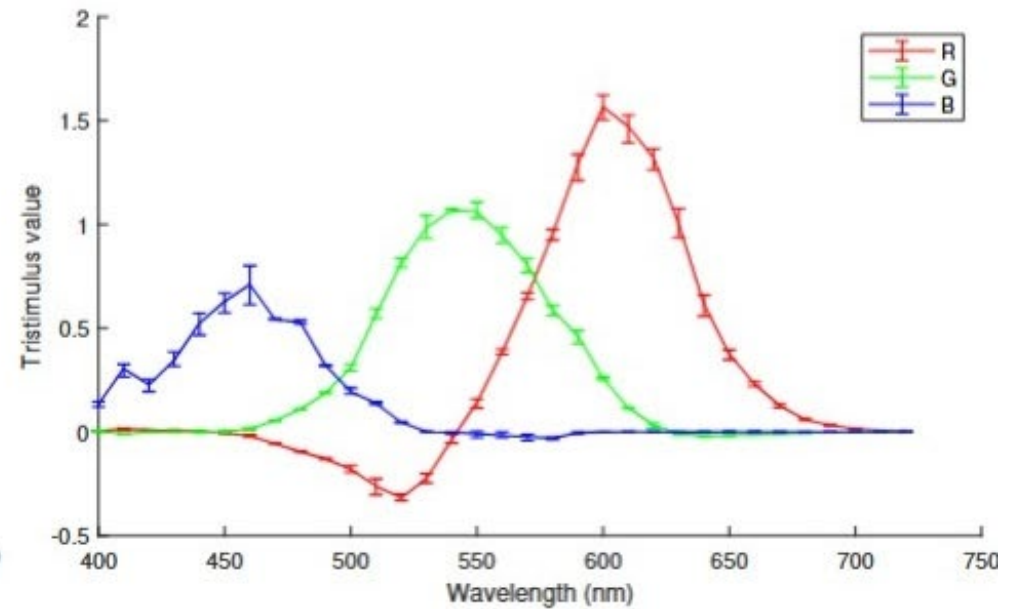


# Observer Colour Matching Functions

The observers in this case, have measured their individual colour matching functions



Observer 1

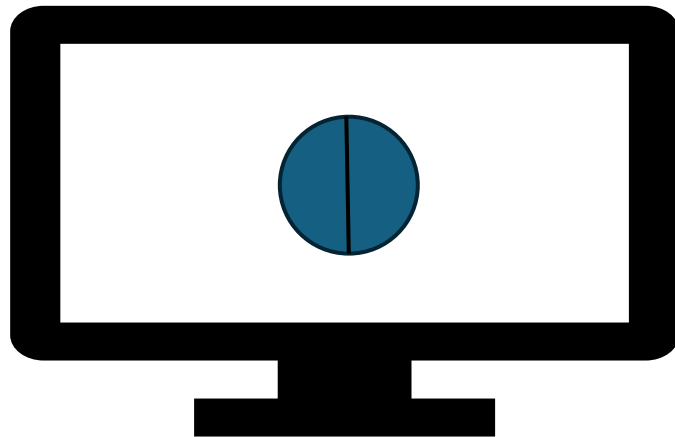


Observer 2



# Experiment

Observer matches display patches to reflectances on a specific display

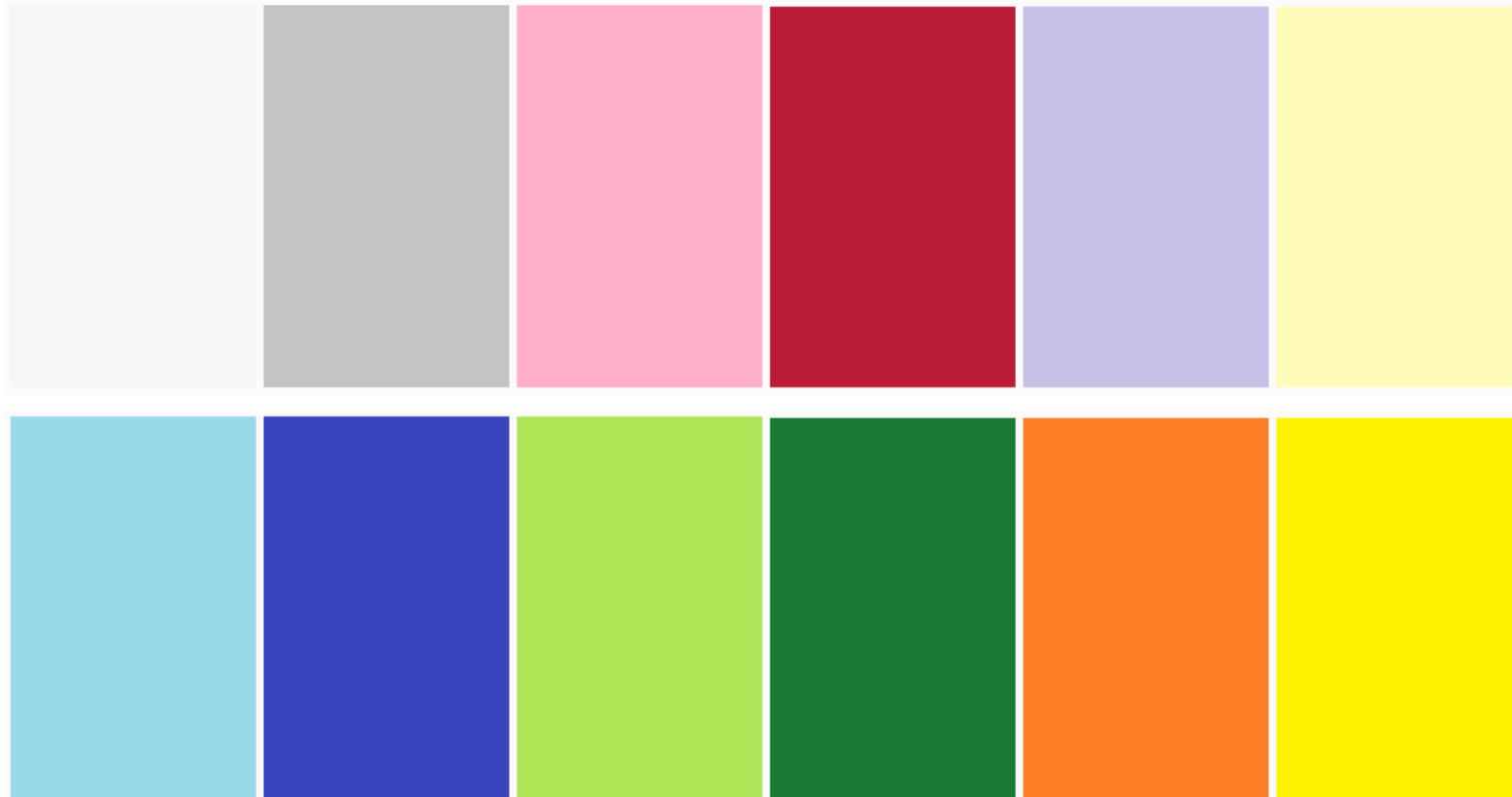


- Illumination: D65, 400 lux using 9 Thouslite LED Cubes
- Display: Brightness 200 cd/m<sup>2</sup>, whitepoint: D65
- Observer – Display distance : 80 cm



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12 carefully chosen coloured papers that will form the  
reference surface reflectance set

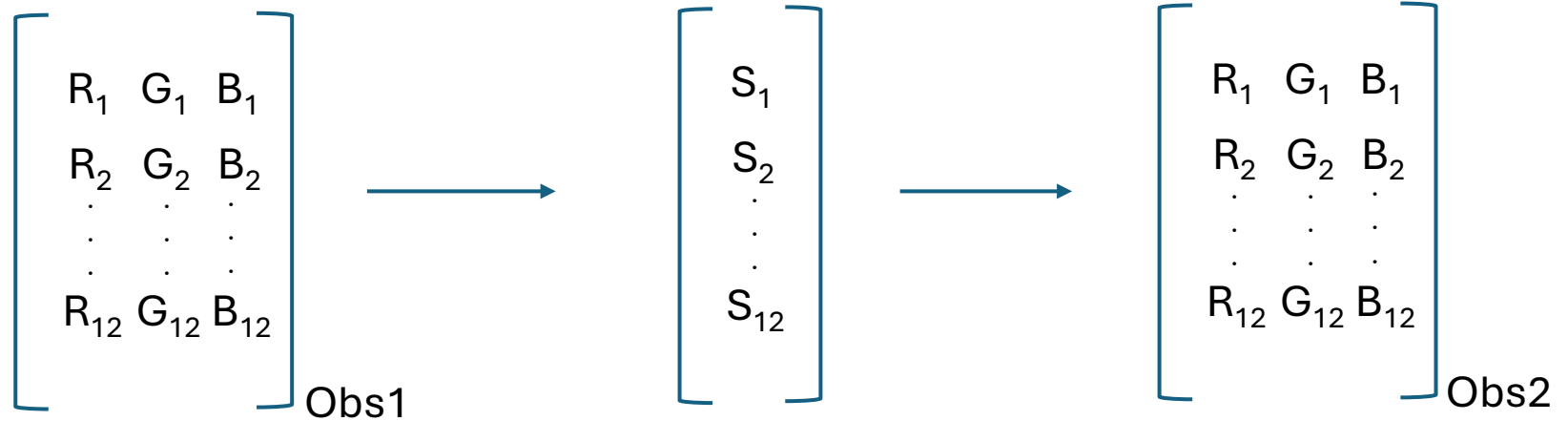






# Experiment

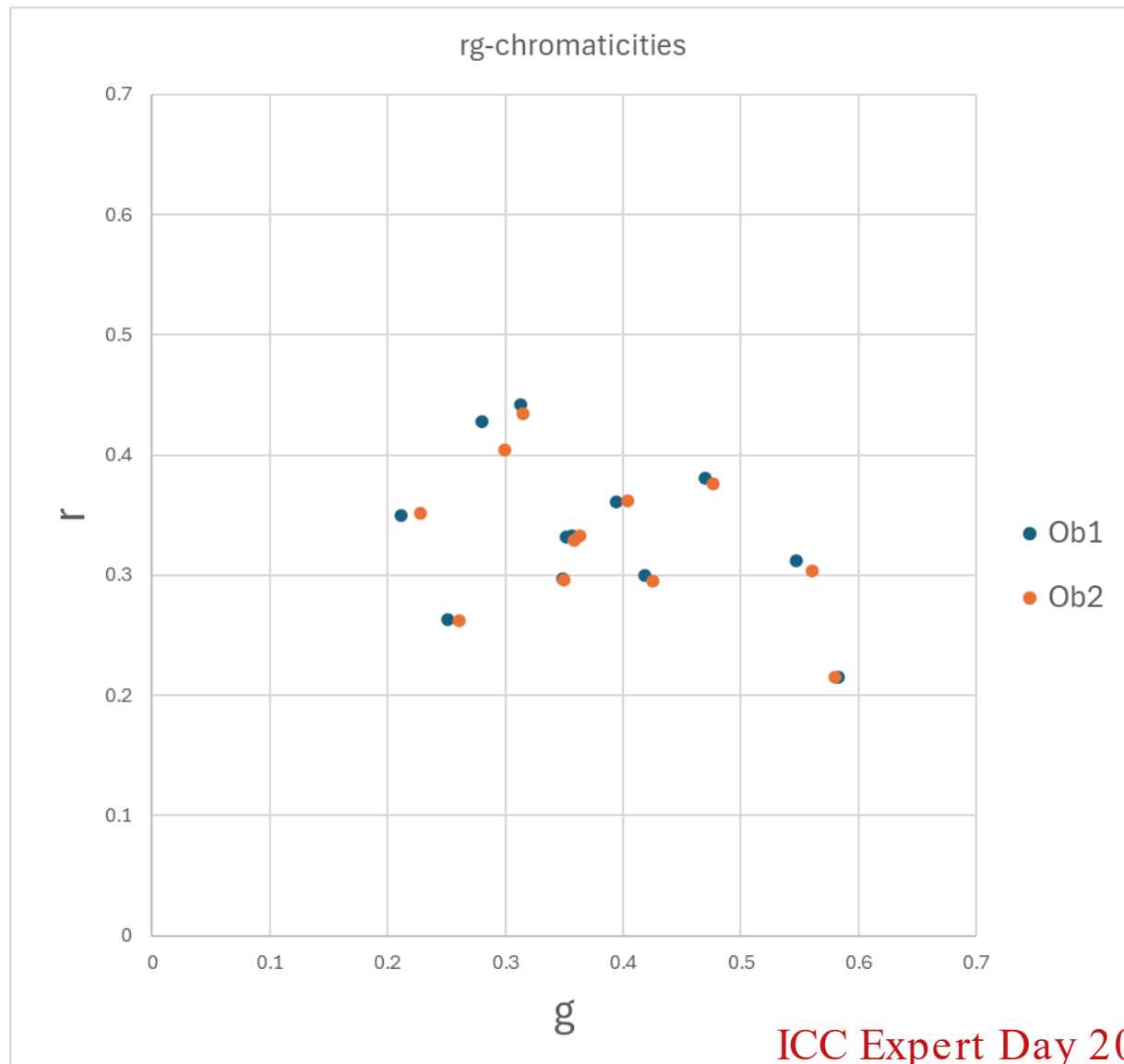
Transforms from Observer specific RGB data to Surface Reflectances



# Some Results

Patches	Intra-Obl	Intra-ObT	Inter-Ob
1Green	2.531	1.857	6.446
2Blue	3.589	2.099	9.463
3White	5.356	2.376	32.337
4Green	3.290	1.549	8.901
5Yellow	2.714	1.115	13.072
6Pink	2.231	1.033	13.912
7Orange	3.716	2.266	12.078
8Blue	6.587	1.791	23.744
9Red	1.712	1.756	5.364
10Purple	3.333	1.391	11.762
11Yellow	3.199	1.178	16.100
12Grey	2.760	0.863	19.146

Mean Colour Difference from the Mean (MCDM)





# Work in Progress

Collecting observer specific RGB data for different displays under a set of illuminations for the same set of reference surface reflectance set

Deriving the forward and inverse observer RGB transformation matrices to and from the intermediate (reflectance/LMS) space based on the collected data

Carry out a psychophysical experiment using observer specific profiles created for the observer

Evaluate the observer specific RGB with the individual colour matching functions