

An Empirical Study of Colour Use

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Introduction

- A motivating example
- Why is it so hard to choose colours?
- Colour spaces
- Learning from the experts



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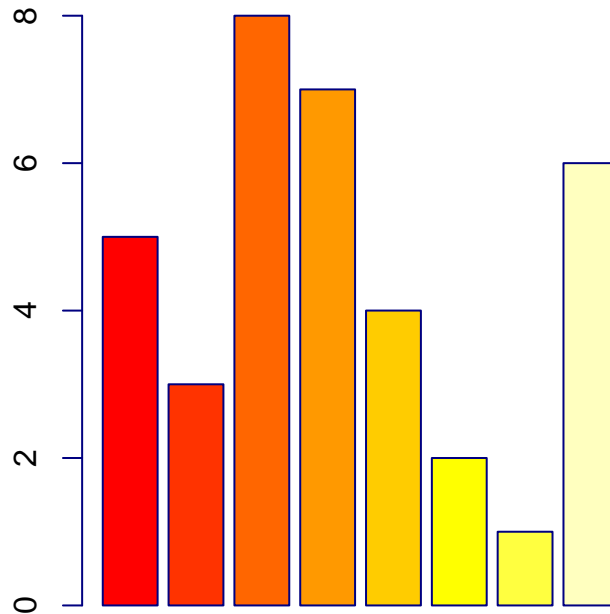


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A motivating example

- Filling regions in barplots (or piecharts, or ...)

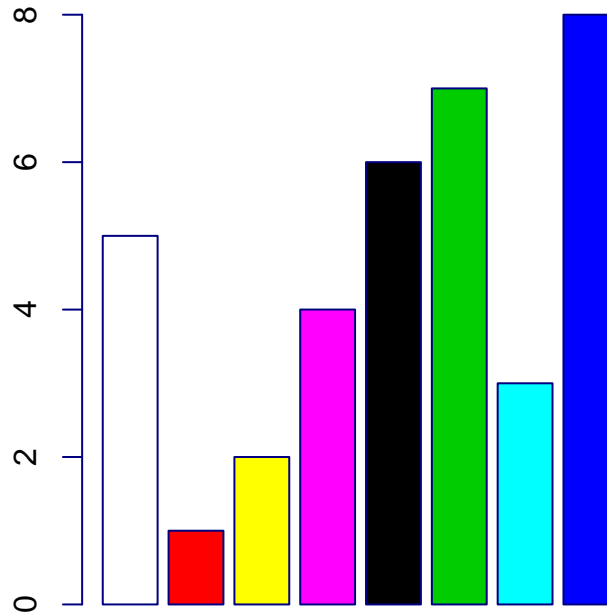


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A motivating example

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Why is it so hard to choose colours?

- Lack of natural talent
- Lack of knowledge about how colour works
- Lack of tools to work with colour
- Lack of knowledge about how to select colours



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Colour spaces

There are three main perceptual components to colour:

- hue (colour)
- lightness (light or dark)
- saturation (brightness, colourfulness)



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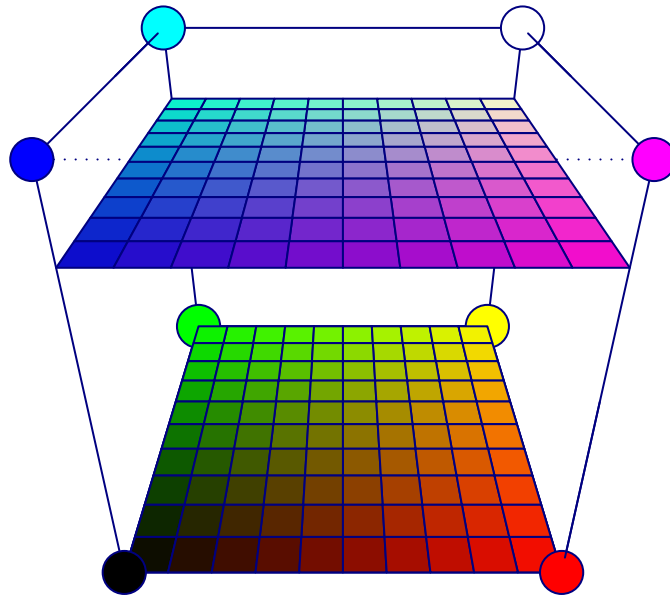
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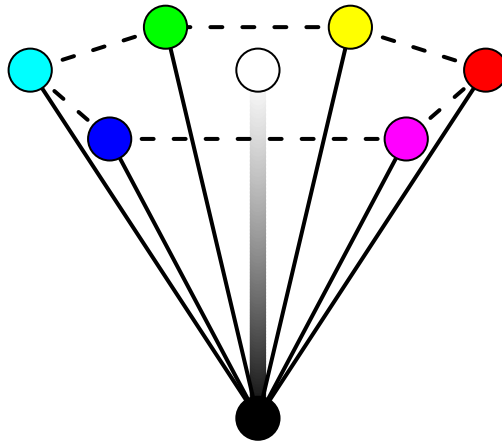
Colour spaces

- RGB colour space confounds hue, lightness, and saturation.



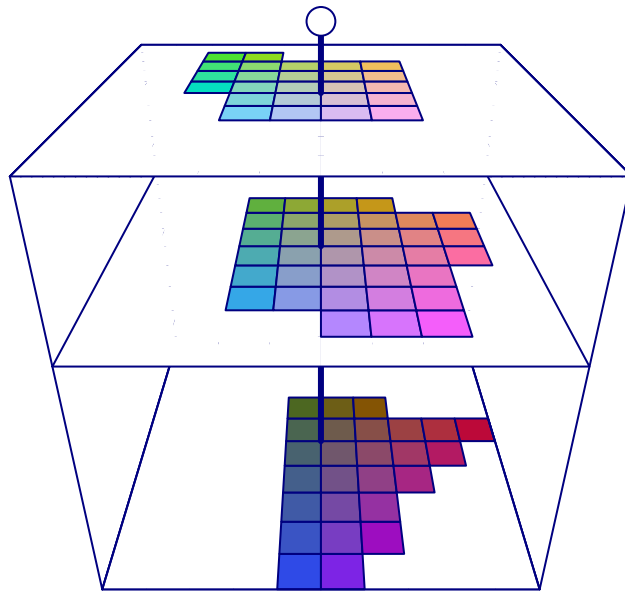
Colour spaces

- HSV colour space directly addresses hue, lightness, and saturation.



Colour spaces

- CIE $L^*u^*v^*$ colour space directly addresses hue, lightness, and saturation AND attempts to make unit steps perceptually uniform.



Learning from the experts

- Interior designers select colours for large areas
- Interior design palettes are available on the internet
- Are there any obvious patterns to these palettes?
- View the palettes in CIE $L^*u^*v^*$ space



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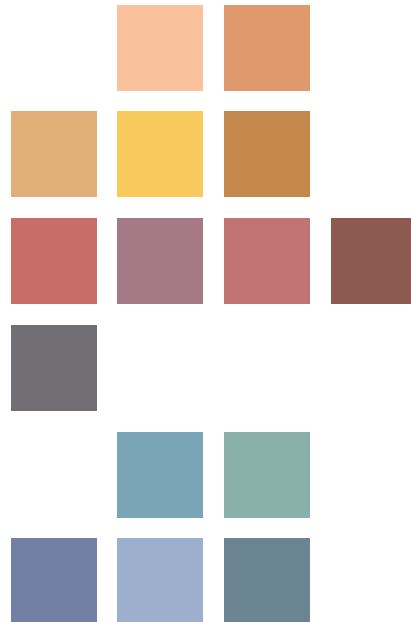


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Victorian Eclectic (“Home Decore” site)

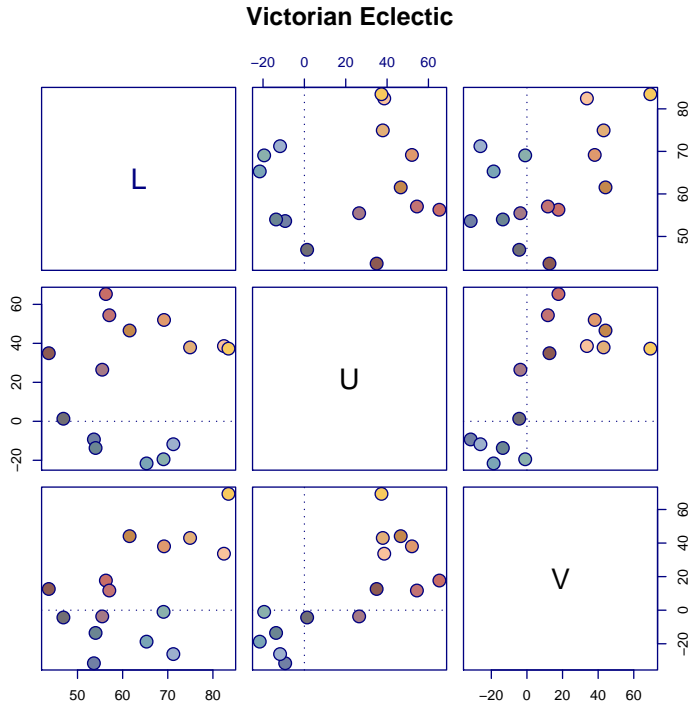
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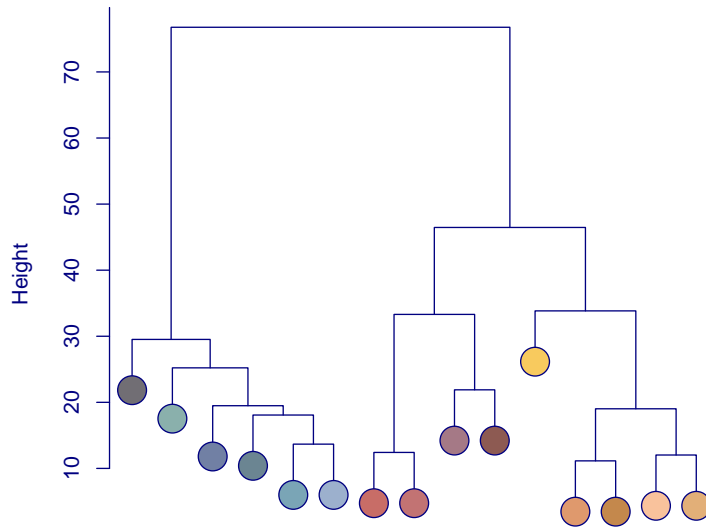


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Victorian Eclectic

Victorian Eclectic Palette



Average Linkage Clustering



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Applying the Expert Example

Basic observations from the experts:

- L between 50 and 80
- U between -20 and 60
- V between -20 and 60

Modifications for barplots:

- Evenly spaced for “equal” difference
- Equal lightness for “equal impact”



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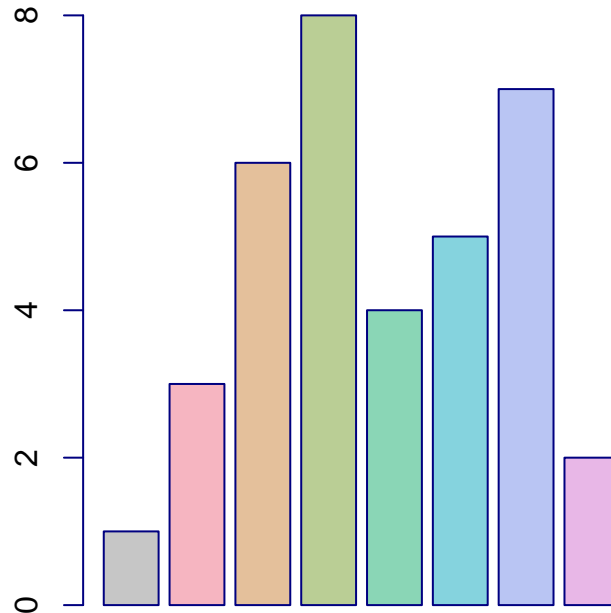


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- Filling regions in barplots (or piecharts, or ...)

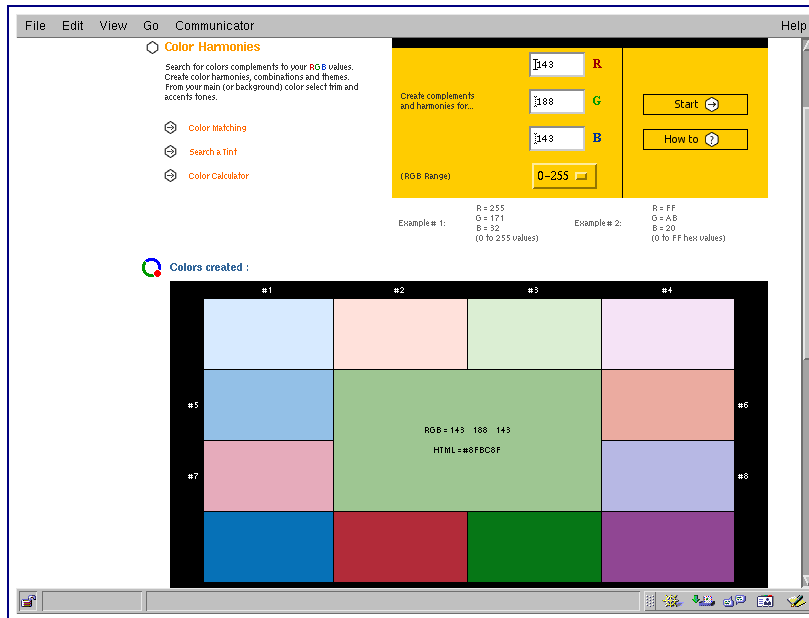


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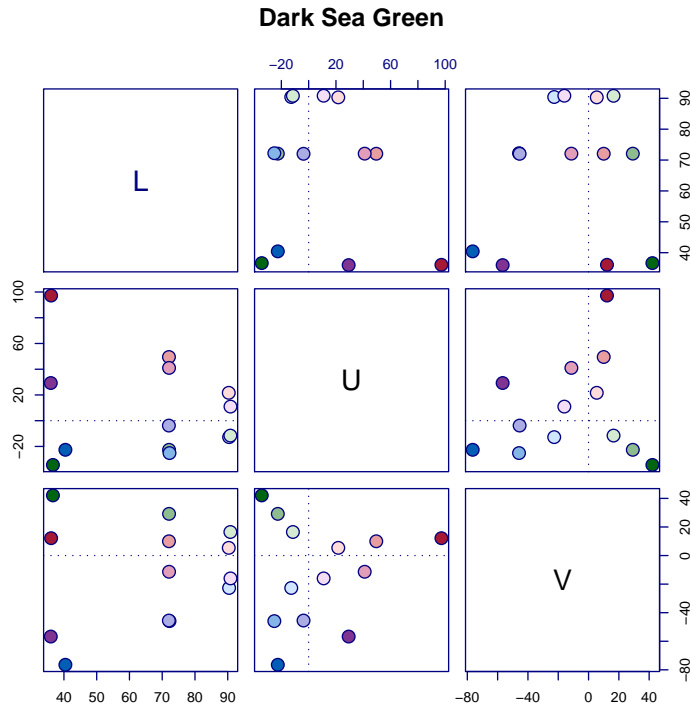
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Learning from the experts

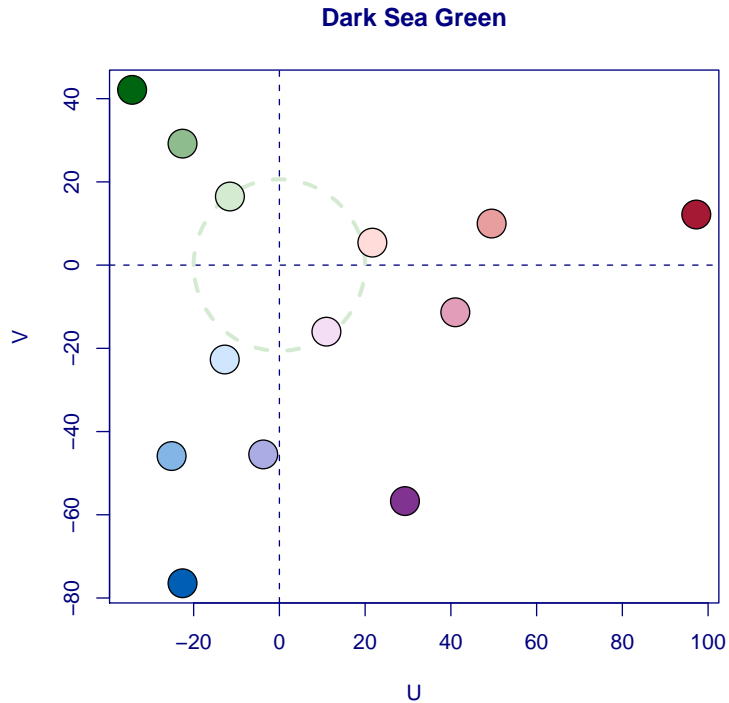
- The EasyRGB web site.



EasyRGB



EasyRGB



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Applying the Expert Example

Basic observations from the experts:

- Halve or double the saturation
- Increase or decrease the luminance
- Generate complementary colours or triads



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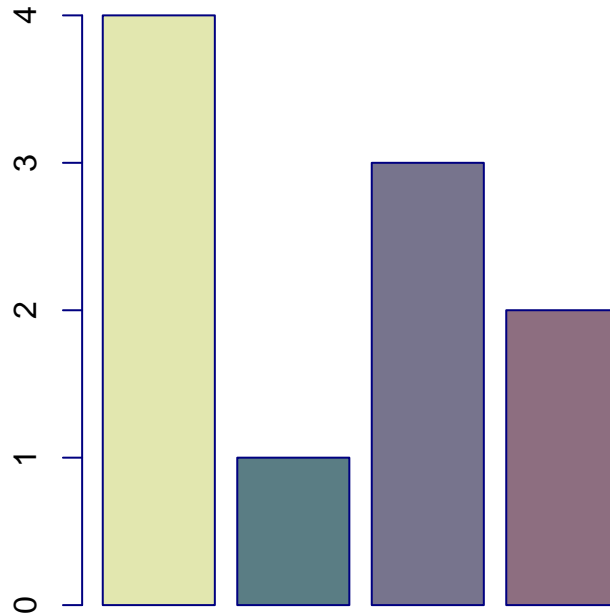


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Caveats

- This is just for barplots
- This is not for colour-blind
- This is not for grayscale printing



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Conclusions

If you collect colour palettes from the web ...

... and you work in the right colour space ...

... and you treat the palette as a data set ...

... and you observe simple patterns in the data ...

... you can generate simple colour palettes of your own
(which don't make you physically ill).



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<http://www.stat.auckland.ac.nz/paul/>

