

# **pavo: Perceptual Analysis, Visualization and Organization of Color Data in R**

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## **Introduction**

Although **pavo** deals largely with spectral reflectance data from bird feathers, it is meant to be applicable for a range of taxa. It provides flexible ways to input spectral data from a variety of equipment manufacturers, process these data and...

This is a random edit by Rafael.

**pavo** was written with the following workflow in mind:

1. **Organize** spectral data by inputting files, processing spectra (e.g., to remove noise, negative values, smooth curves, etc.)
2. **Analyze** the resulting files, either using typical tristimulus color variables (hue, saturation, brightness) or using visual models based on perceptual data from the taxon of interest.
3. **Visualize** the output

## **1 Organizing and Processing Spectral Data**

blah blah blah

## **2 Analyzing Spectral Data**

### **2.1 Overview**

add description here

## 2.2 Variables calculated

Color Variable	Equation	Description
B1	$\sum_{\lambda=300}^{700} R_{\lambda}$	Total brightness, total reflectance
B2	$B_1/n_{wl}$	Mean brightness.
B3	$R_{\max}$	Intensity.
S1		Chroma, spectral purity.
S2	$R_{\max}/R_{\min}$	Spectral saturation
S3		
S4		
S5		
S6		
S7		
S8		
S9		
S10		
H1	$\lambda_{R\max}$	Hue: wavelength of peak reflectance
H2		
H3		
H4		
H5		

Table 1: The complete set of tristimulus variables calculated by `summary` in `pavo`

Color variables described in Table 1.

blah blah blah<sup>1</sup> and also this.

## 3 Visualizing Spectral Data

```
> data(sicalis)
> plot(sicalis, type='o', col=spec2rgb(sicalis))
> #plot(sicalis, type='s', col=spec2rgb(sicalis))
```

Colors can be mapped to spectra using `spec2rgb` as shown in Figure 2.

## Examples

```
> hist(rnorm(50))
```

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<sup>1</sup>some footnote text here

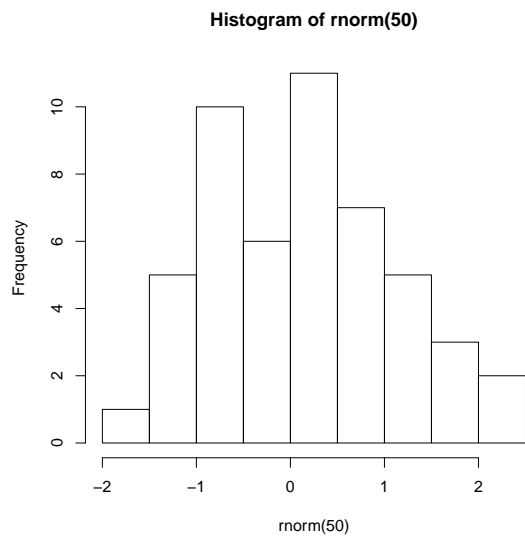


Figure 1: Sample plot.

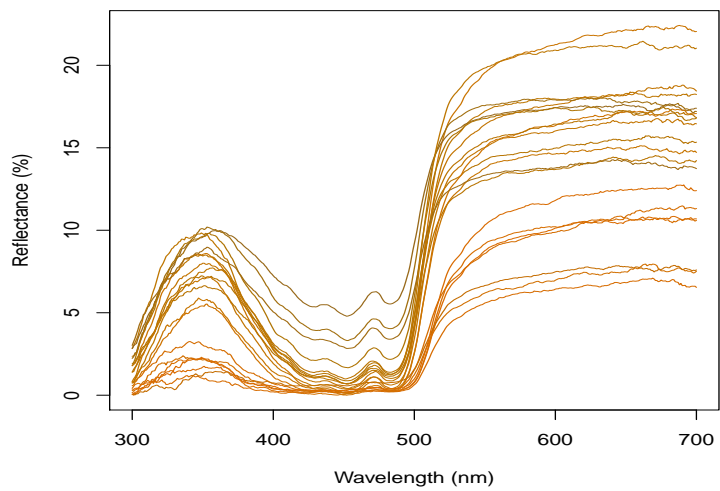


Figure 2: Overlay plot with colors calculated from human color matching functions

## More examples

Some more examples: