17 December 2012

To the editors of *Methods in Ecology and Evolution,*

Please find the attached manuscript entitled “**pavo: an R package for the perceptual analysis, visualization and organization of spectral colour data**”, which we are submitting for consideration for publication as an *Applications* paper in *Methods in Ecology and Evolution*. We were encouraged to submit this manuscript after a brief (and informal) pre-submission inquiry with dr. Bob O’Hara, who believed it may be of interest for publication in *Methods in Ecology and Evolution*.

A stable release of the package we describe in the paper has recently been made available from CRAN (http://cran.r-project.org/web/packages/pavo/index.html), but the work included in the manuscript has otherwise not been published nor is being considered for publication elsewhere. The work is original and all the necessary acknowledgements have been made. All persons entitled to authorship have been included, and all authors have read and approved the submitted version of the manuscript. None of the authors have any potential conflicts of interest and all work conformed to legal requirements of both Canada and the USA.

The manuscript describes pavo, a new R package developed to handle the organization, visualization, and analysis of spectral colour data. The study of colouration has increased dramatically over the last decades, in part due to the popularization of portable spectrophotometers capable of objectively measuring reflectance. However, handling and obtaining relevant variables from the raw spectral data has always been a challenge. The lack of a standardized methodology for doing so has led researchers to develop their own individual methods, “re-inventing the wheel” over and over again. This has slowed progress in the field, isolated research groups and made results nearly impossible to compare and replicate.

Our package attempts to address this problem: it is highly flexible and allows researchers conducting studies using spectral data in almost any taxa to work in a unified framework. pavo provides a cohesive framework for the organization and processing of spectral data, several visualization options (both for exploratory analyses and presentation of results), and multiple methods for obtaining summary colourimetric data, including models that account for the visual system phenotype of the observer. Furthermore, pavo implements suggestions for unresolved topics in previously implemented methodologies, thus helping advance the field. The manuscript presents a summary of the functions implemented in pavo, with an example highlighting some of the package’s capabilities.

We demonstrate that pavo provides a flexible environment capable of tackling complex ecological questions which previously were either unavailable to most researchers or required the use of multiple software and programs. In fact, one of the main motivations to develop and make available this package was the frequent requests from other researchers for code and methodological consultation. At least two papers from researchers not connected to our groups (Hudon *et al.* 2012 *Auk* 129:491-499, Farallo & Forstner 2012 *PLOS One* 7:e30316) have been published making use of our code. We are currently aware of at least two more manuscripts from other research groups that are in final stages of preparation, and four manuscripts currently in revision from our labs, that make use of the development and release versions of pavo. CRAN and github (where the development versions of the package are maintained) do not provide download statistics, but the webpage announcing the package release received 126 unique page views in the first day, and we have been contacted by several students and established researchers expressing their satisfaction that such a tool is finally available. For these reasons, we believe that the paper will be of great interest to researchers in the discipline.

Because of their knowledge on colour research, thorough expertise in methodological aspects of colour measurement and analysis and in developing approaches or software to handle spectral data, we recommend the following researchers as potential referees:

1. Dr. Staffan Andersson, University of Gothenburg: [staffan.andersson@bioenv.gu.se](mailto:staffan.andersson@bioenv.gu.se)
2. Dr. Robert D. Montgomerie, Queen’s University: [mont@queensu.ca](mailto:mont@queensu.ca)
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4. Dr. John Endler, Deakin University: [john.endler@deakin.edu.au](mailto:john.endler@deakin.edu.au)

Thank you for considering our submission to *Methods in Ecology and Evolution*. Please let me know if you need anything else. I look forward to hearing from you in the near future.

Sincerely,

Rafael Maia