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# Using digital photography to study animal coloration FREE

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## Abstract

In understanding how visual signals function, quantifying the components of those patterns is vital. With the ever-increasing power and availability of digital photography, many studies are utilizing this technique to study the content of animal colour signals. Digital photography has many advantages over other techniques, such as spectrometry, for measuring chromatic information, particularly in terms of the speed of data acquisition and its relatively cheap cost. Not only do digital photographs provide a method of quantifying the chromatic and achromatic content of spatially complex markings, but also they can be incorporated into powerful models of animal vision. Unfortunately, many studies utilizing digital photography appear to be unaware of several crucial issues involved in the acquisition of images, notably the nonlinearity of many cameras' responses to light intensity, and biases in a camera's processing of the images towards particular wavebands. In the present study, we set out step-by-step guidelines for the use of digital photography to obtain accurate data, either independent of any particular visual system (such as reflection values), or for particular models of nonhuman visual processing (such as that of a passerine bird). These guidelines include how to: (1) linearize the camera's response to changes in light intensity; (2) equalize the different colour channels to obtain reflectance information; and (3) produce a mapping from camera colour space to that of another colour space (such as photon catches for the cone types of a specific animal species).

**Keywords:** [camera calibration](#), [colour vision](#), [colour measurement](#), [digital cameras](#), [imaging](#), [radiance](#), [reflection](#), [signals](#)

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