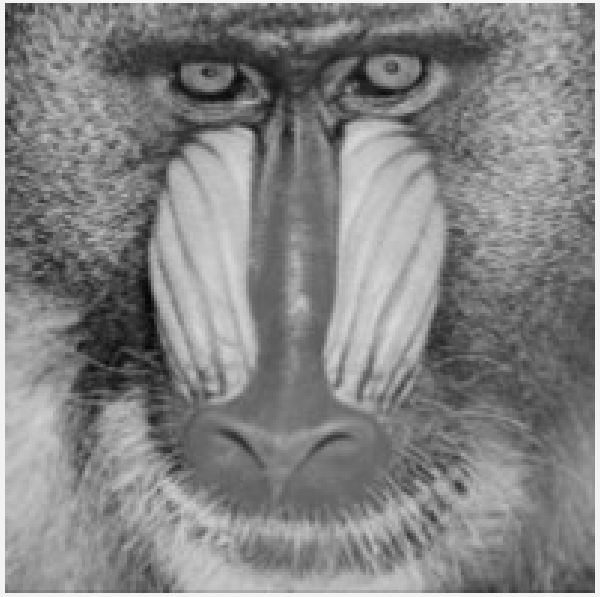
Department of Computer Science
University of Bristol

COMS30121
Image Processing and Computer Vision

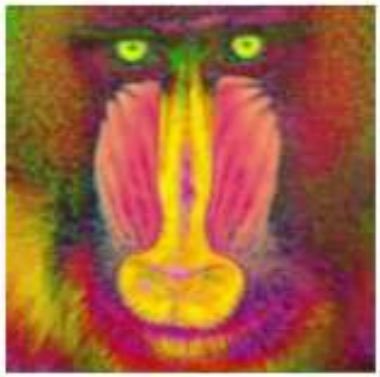


Lab Week 02

Pixels, Channels and Convolution Basics

Task 1: Representation Basics – Pixels, Colours & Channels

After looking at the example code on the unit website, your first task is to recover as much of the original mandrill colour image (3 channels, 8bit per channel) from corrupted images: To do this, first view the corrupted images and, for each image, make a prediction of what has happened to it. Maybe look at individual colour channels or histograms to investigate your hypothesis. In a second step write a small OpenCV program for each image which can reconstruct the original mandrill colour image from it as well as possible. Image 2 cannot be fully reconstructed.



Task 2: Convolution Basics

Your second task is to write a small program that performs convolution between an input image (e.g. the mandrill image) and a kernel image (e.g. the simple 3x3 image given below). Implement the convolution function yourself by accessing pixels - for the moment ignore the OpenCV commands that can perform convolution. The operation is so fundamental to image processing that you should write it yourself at least once. Test your program on the mandrill image and the kernel below. What can you say about the output produced? Why do we need the factor 1/9?

$$* \; 1/9 \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$$