IMAGE OPTIMIZATION
AND COLOUR PALETTES

WHAT IS IMAGE OPTIMIZATION?

Image optimization is a process of reducing file size while preserving quality.

This process helps to reduce the latency of a webpage while still maintaining overall aesthetics.

HOW DOES OPTIMIZATION WORK?

Optimizing an image involves a process called compression.

Compression is the act of reducing or discarding irrelevant information within an image. Removing information from an image file also reduces the file size.

TYPES OF COMPRESSION

LOSSY COMPRESSION

Reduces the file size of an image, but also reduces the image quality. A common side-effect of lossy compression is a phenomenon called compression artifacting. Usually, the difference in image quality is imperceptible by the human eye.

LOSSLESS COMPRESSION

Reduces the file size of an image without sacrificing image quality.

WEB-SAFE IMAGE FILE FORMATS

JPEG

- **lossy compression**
- supports +16 million colours
- no transparency
- best for photographs

GIF

- **lossless compression**
- suports up to 256 colours
- index transparency
- supports animation
- best for images with few colours

PNG

- **lossless compression**
- supports +16 million colours
- alpha transparency
- works well with any image, not supported by some browsers

JPEG
COMPRESSION

This method of compression discards colour information, reducing image detail. Recompressing the image further reduces quality.

Heavier levels of compression introduce compression artifacts.

JPEG
COMPRESSION

Quality level: 100

The highest level of quality also produces the lowest level of compression.

So far, the difference in quality is imperceptible.

313 KB

JPEG COMPRESSION

Quality level: 50

A mid-level compression. We begin to see the introduction of artifacts as well as a slight loss of detail. Sharp edges within the image begin to appear blurry.

59 KB

JPEG COMPRESSION

Quality level: 10

A very high level of compression. Most detail has been discarded from the image, resulting in a higher level of pixellation.

21.2 KB

GIF
COMPRESSION

This method of compression does not reduce quality, however a palette of only 256 colours can be used.

These can be any 256 colours from the +16 million colours available from the JPEG compression method.

GIF
COMPRESSION

256 colour palette

The palette is contructed by sampling the 256 most common colours within the original image.

177 KB

GIF
COMPRESSION

128 colour palette

The palette is contructed by sampling the 128 most common colours within the original image.

152 KB

GIF
COMPRESSION

64 colour palette

The palette is contructed by sampling the 64 most common colours within the original image.

121 KB

GIF
COMPRESSION

32 colour palette

The palette is contructed by sampling the 32 most common colours within the original image.

102 KB

GIF
COMPRESSION

16 colour palette

The palette is contructed by sampling the 16 most common colours within the original image.

78.4 KB

GIF
COMPRESSION

8 colour palette

The palette is contructed by sampling the 8 most common colours within the original image.

59.3 KB

GIF
COMPRESSION

4 colour palette

The palette is contructed by sampling the 4 most common colours within the original image.

41.6 KB

GIF
COMPRESSION

2 colour palette

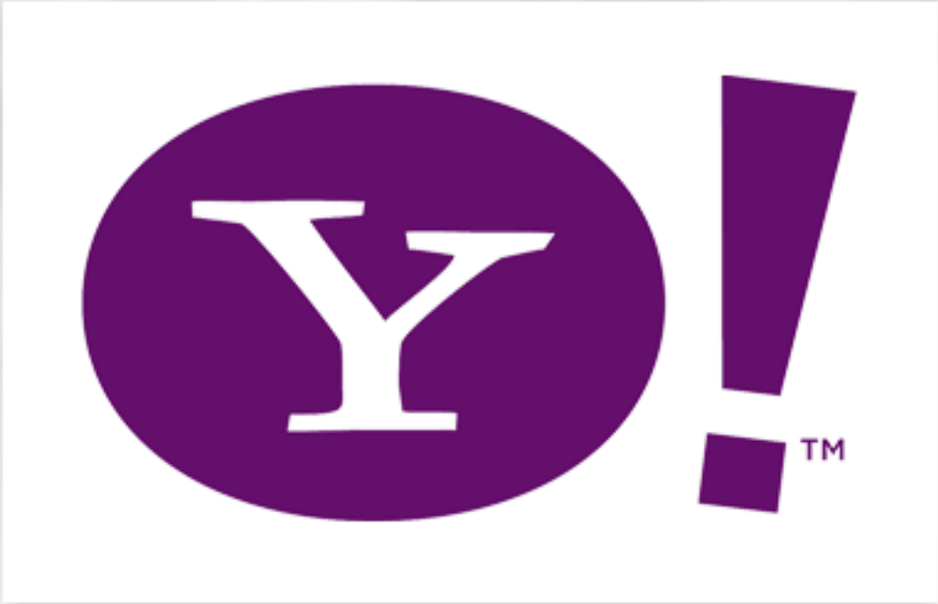
The palette is contructed by sampling the 2 most common colours within the original image.

21.6 KB

GIF FORMAT
IN PRACTICE

Because of the colour palette limitations, GIF compression is best used for images containing very few colours.

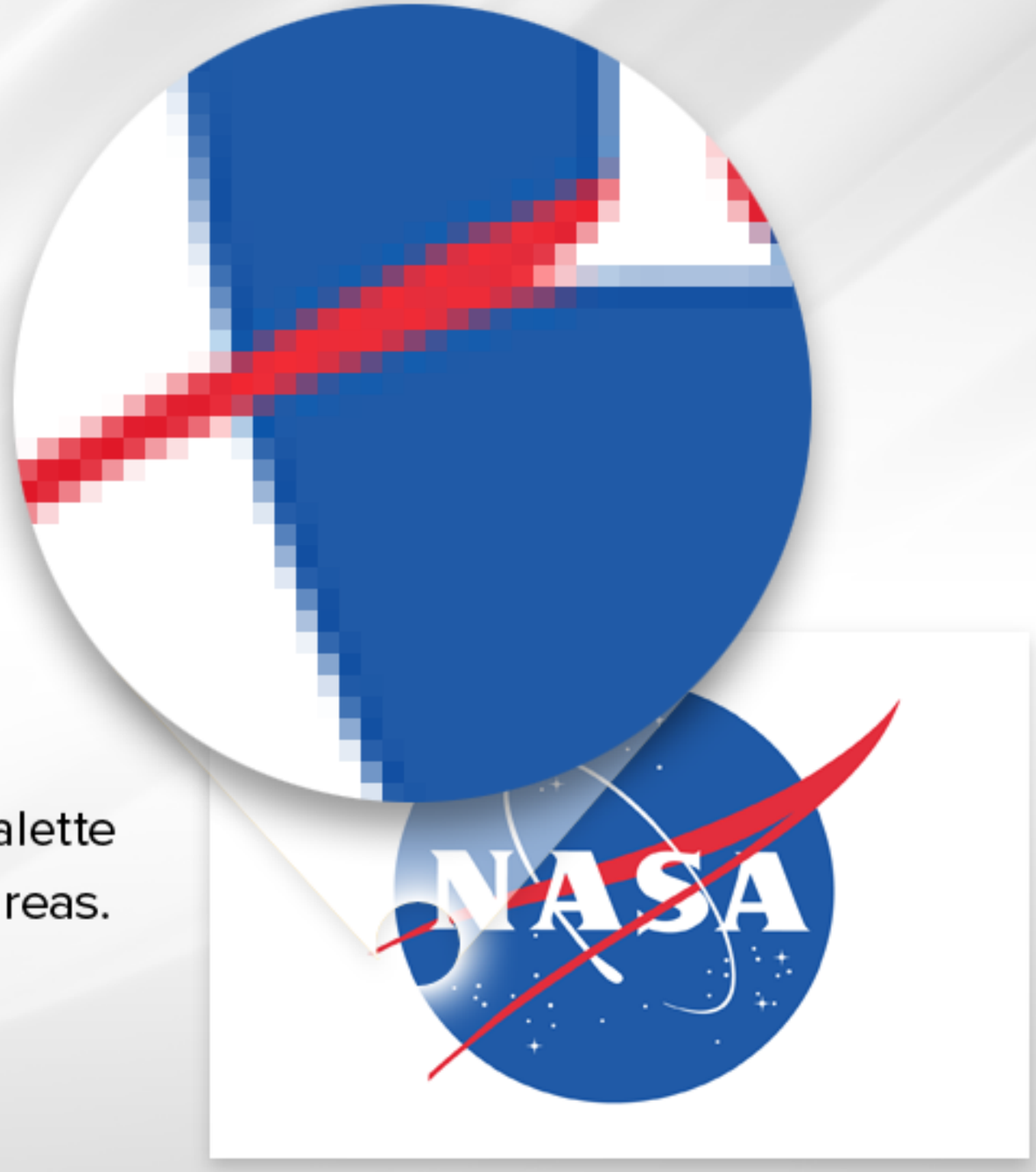
Images such as small logos and tiling background images make good candidates for GIF compression.



GIF FORMAT
IN PRACTICE

Keep in mind that although an image may appear to use only a few colours, areas such as smooth edges may contain extra colour information.

Reducing the number of colours in the palette will also reduce the smoothing in these areas.



PNG
COMPRESSION

PNG is a form of lossless compression. It is the only one of the three formats that supports alpha transparency.

Like JPEG format, it supports +16 milion colours.

PNG
COMPRESSION

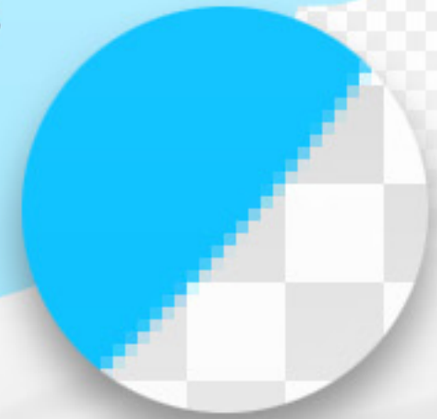
Alpha Transparency

Index Transparency

PNG
COMPRESSION

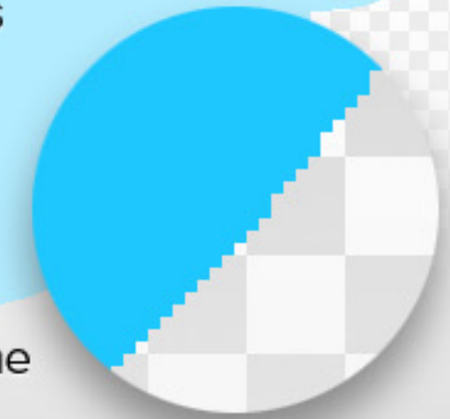
Alpha transparency allows for smooth edges with varying gradations of transparency.

This is useful for overlays, and images containing rounded edges or drop shadows.

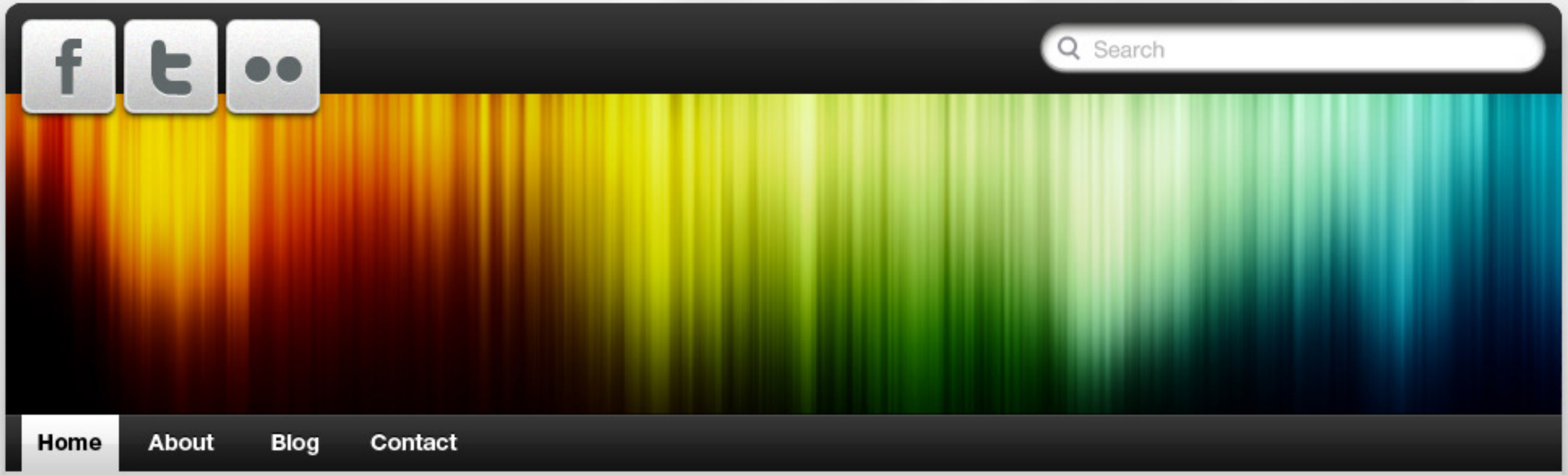


Index transparency only allows one level of transparency; i.e., a pixel is either fully transparent or fully coloured.

This results in hard, pixellated edges around the image.



PRACTICAL IMPLEMENTATION



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Posted by Aaron Ritchie

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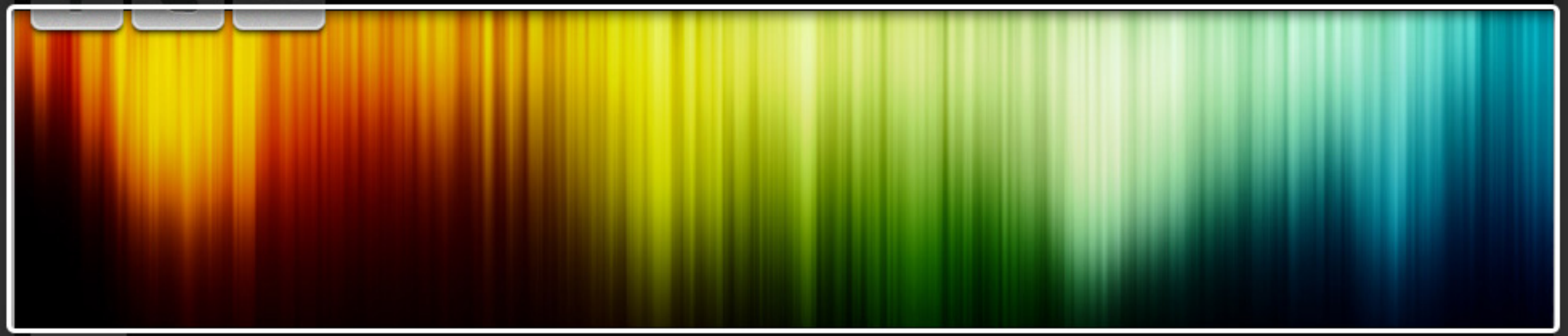

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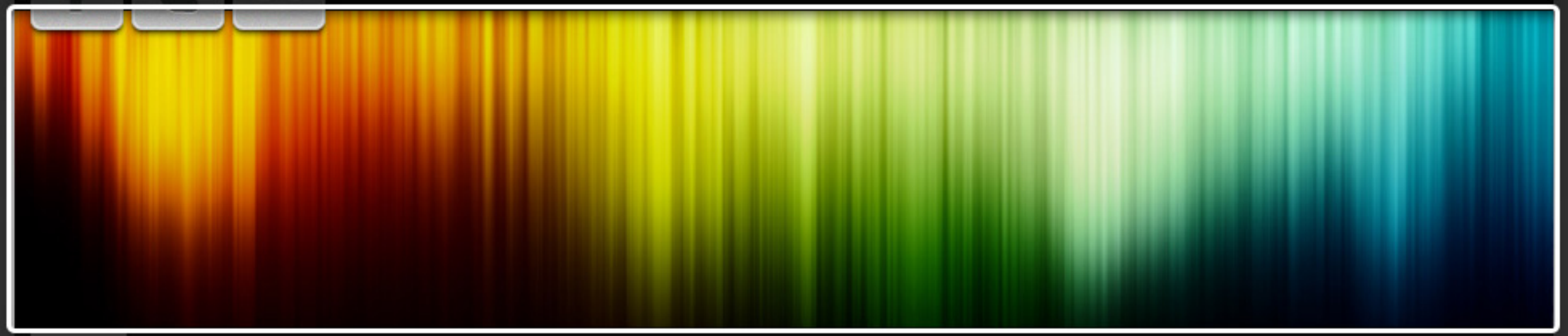


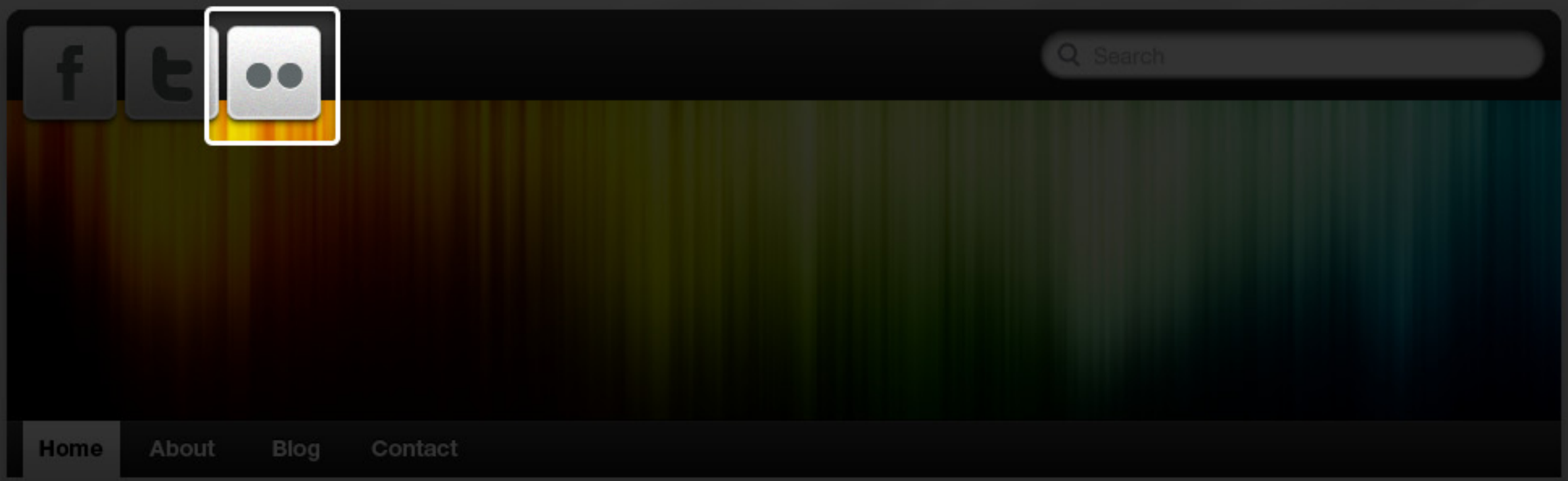
JPEG

56.81 KB @ 65% quality

- large image
- many different colours
- no transparency needed

PNG approx. 232 KB
GIF not enough colours

PRACTICAL IMPLEMENTATION



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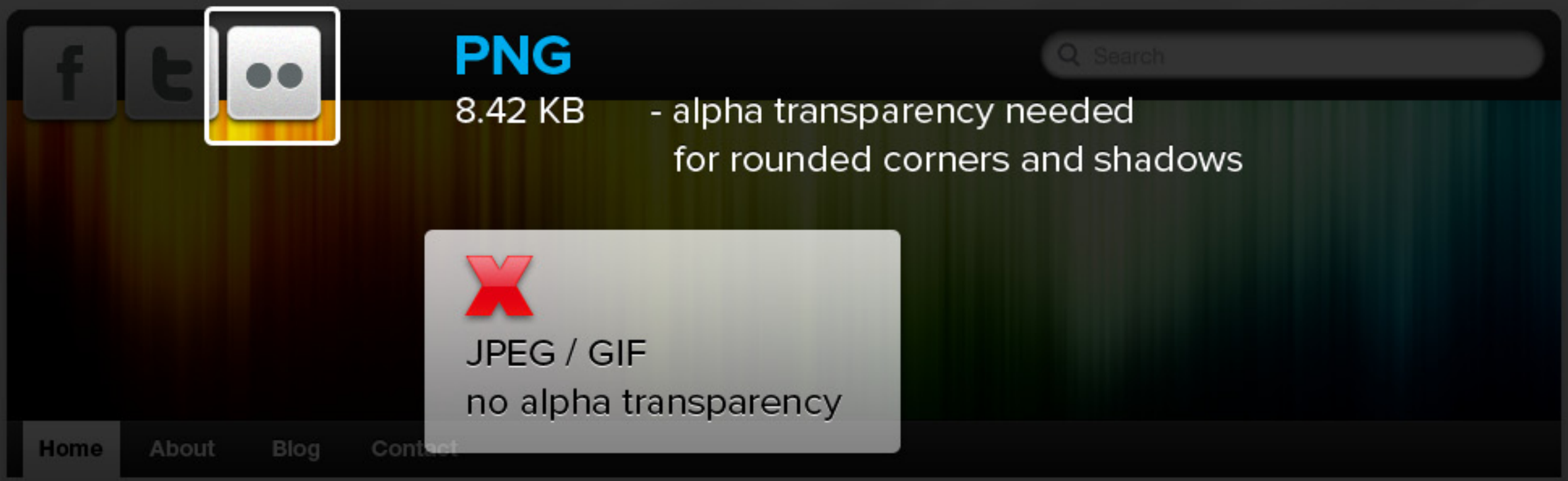

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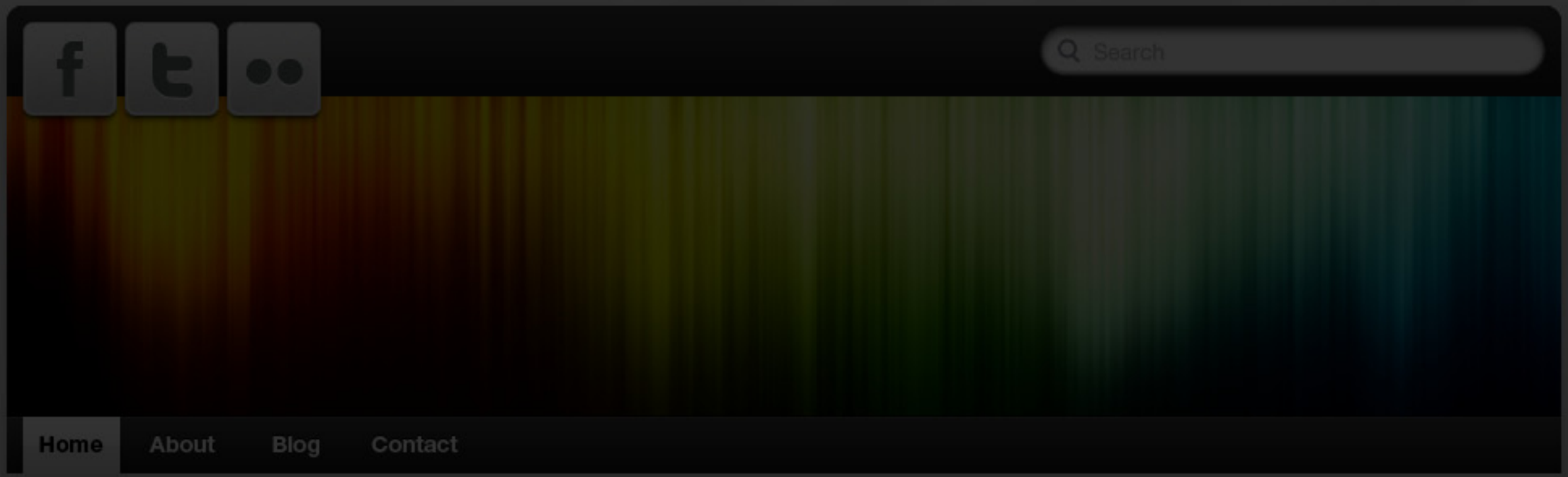

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