Image File Formats

Image file formats: bitmap, jpeg, tiff, gif, mpeg, pgm, ppm

Image files have two parts:

- header
  - file type info, magic number
  - image dimensions
  - color palette,...
- raster data — image pixels

Manipulating Images

Existing software for file format conversions:

- Matlab
- pbmplus (Unix, Linux)
- xv (Unix, Linux)
- ImageMagick (Unix, Linux, Windows, Mac)
- Vision SDK (Windows) + ImageMagick (check version)

Portable Gray Map: PGM

The portable graymap format is a lowest common denominator grayscale file format. The definition is as follows:

- A “magic number” for identifying the file type. A pgm file’s magic number is the two characters “P2”.
- Whitespace (blanks, TABs, CRs, LFs).
- A width, formatted as ASCII characters in decimal.
- Whitespace.
- A height, again in ASCII decimal.
- Whitespace.
- The maximum gray value, again in ASCII decimal.
- Whitespace.

- Width * height gray values, each in ASCII decimal, between 0 and the specified maximum value, separated by whi- tespace, starting at the top-left corner of the graymap, proceeding in normal English reading order. A value of 0 means black, and the maximum value means white.
- Characters from a “#” to the next end-of-line are ignored (comments).
- No line should be longer than 70 characters.

Here is an example of a small graymap in this format:

```
P2
# feep.pgm
24 7
15
0 0 0 0 0 0 0 0 0 0 0 0 0  0  0  0  0 0 0  0  0  0  0 0
0 3 3 3 3 0 0 7 7 7 7 0 0 11 11 11 11 0 0 15 15 15 15 0
0 3 0 0 0 0 0 7 0 0 0 0 0 11  0  0  0 0 0 15  0  0 15 0
0 3 3 3 0 0 0 7 7 7 0 0 0 11 11 11  0 0 0 15 15 15 15 0
0 3 0 0 0 0 0 7 0 0 0 0 0 11  0  0  0 0 0 15  0  0  0 0
0 3 0 0 0 0 0 7 7 7 7 0 0 11 11 11 11 0 0 15  0  0  0 0
0 0 0 0 0 0 0 0 0 0 0 0 0  0  0  0  0 0 0  0  0  0  0 0
```


Rawbit Variant

This variant is different in the following ways:

- The “magic number” is “P5” instead of “P2”.
- The gray values are stored as plain bytes, instead of ASCII decimal.
- No whitespace is allowed in the grays section, and only a single character of whitespace (typically a newline) is allowed after the maxval.
- The files are smaller and many times faster to read and write.

Note that this raw format can only be used for maxvals less than or equal to 255.

Color Images: PPM

Pixels are represented by their *red, green,* and *blue* values.

ASCII data: Magic number "P3"

RAWBIT data: Magic number "P6"