CV Cheat Sheet

Images

BMP Format

file header (size, offset, ...)
info header (DIB) (width, height, ...)
optional color palette
image data

File Header

14 bytes

- magic identifier: 2 bytes
- file size : 4 bytes
- 2 reserved places: 2 bytes each
- offset to image data: 4 bytes

Info Header

40 bytes

- header size in bytes: 4 bytes
- width and height : 4 bytes each
- number of color planes: 2 bytes
- number of bits per pixel: 2 bytes
- compression (0 to 4): $0 = none$
- image size in bytes

Note that the order is $B \to G \to R$.

Color Palette

- If present, then a pixel is stored in ≤ 1 bytes.
- Each color entry is in $RGBA$ format with 4 bytes.
- If not present, $offset = 14 + 40 = 54$, else $offset = 54 + 4 * nColors$.

Arithmetic Operations

Addition

$I(x,y) = I_1(x,y) + I_2(x,y)$
OR
$I(x,y) = I_1(x,y) + C$

Overflow

$I(x,y) > max\ (255)$?
1. Wrapping: $I'(x,y) = I(x,y) - (max + 1)$
2. Saturation: $I'(x,y) = max$

Subtraction

usage: detect changes between 2 images.
$I(x,y) = I_1(x,y) - I_2(x,y)$
OR
$I(x,y) = I_1(x,y) - C$

Overflow

$I(x,y) < 0$?
1. Wrapping: $I'(x,y) = I(x,y) + (max + 1)$
2. Saturation: $I'(x,y) = 0$
3. Absolute: $I'(x,y) = |I(x,y)|$

Multiplication

$I(x,y) = I_1(x,y) * I_2(x,y)$
OR
$I(x,y) = I_1(x,y) * C$

Division

$I(x,y) = I_1(x,y) \div I_2(x,y)$
OR
$I(x,y) = I_1(x,y) \div C$

Blending

Logical Operators

Or

Bitshift Operators

Geometric Operations

Translation

Rotation

Scaling

Subsampling

Upsampling

Reflection

Affine Transformation

Homography Transformation

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Digital Filters

Linear Filters

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Non-linear Filters

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