Libraw

Supported Formats: supports a broad array of RAW image formats from most popular camera manufacturers (Canon: CRW, CR2, CR3; Nikon: NEF, NRW; Sony: ARW, SR2, SRF; Fujifilm: RAF; Panasonic: RW2, RAW; Olympus: ORF; Pentax: PEF; Leica: RWL, DNG; Samsung: SRW; Sigma: X3F), but does not natively support common image formats like JPEG, PNG, BMP, or GIF.

EXIF Data Extraction: libraw is capable of extracting EXIF data from RAW images

Language Interfaces:

- C/C++: The native interface of *libraw*, providing full access to its features and capabilities.
- Python: library can be used in Python through third-party bindings like *rawpy*.
- Java: While there isn't a direct binding, *libraw* can be accessed in Java via *JNI* (Java Native Interface) or by using command-line calls to a C++ program that utilizes *libraw*.

Comment: To work with these formats, you can use other libraries that complement libraw. Some libraries that can handle these common image formats, along with examples of how to integrate them with libraw for comprehensive image processing: *OpenCV*, *ImageMagick*, *stb_image*

ExifTool

Supported Formats: supports a vast array of file formats:

- RAW Image Formats: CR2, NEF, ARW, RAF, RW2, DNG, ORF, and many others.
- Standard Image Formats: JPEG, TIFF, PNG, GIF, BMP.
- Video Formats: AVI, MP4, MOV, FLV, MKV.
- Audio Formats: MP3, WAV, AIFF.
- Document Formats: PDF, DOCX, EPUB.

EXIF Data Extraction: *ExifTool* excels at extracting EXIF data from images. It can read and write metadata for a wide variety of standards (EXIF: Metadata embedded by digital cameras; IPTC: Metadata used by news organizations; XMP: Metadata used by Adobe products and others)

Language Interfaces:

- C/C++: While there **isn't a direct C++ API**, you can call *ExifTool* using system calls. (std::string command = "exiftool -Model -ISO example.CR2"; std::system(command.c_str());)
- Python: The *exiftool* library is a simple wrapper to call ExifTool from Python scripts. (import exiftool)
- Java: You can use ***Runtime.getRuntime().exec()*** to call *ExifTool*. (Process process = Runtime.getRuntime().exec("exiftool -Model -ISO example.CR2"); BufferedReader reader = new BufferedReader(new InputStreamReader(process.getInputStream()));)

GExiv2

Supported Formats: supports a broad range of image formats through the underlying Exiv2 library (JPEG (.jpg, .jpeg); TIFF (.tif, .tiff); RAW formats from various camera manufacturers such as: Canon (.CR2), Nikon (.NEF), Sony (.ARW), Fujifilm (.RAF), Panasonic (.RW2), PNG (.png), BMP (.bmp), GIF (.gif))

EXIF Data Extraction: provides comprehensive capabilities for extracting, reading, and writing EXIF data.

Language Interfaces:

- C/C++: Directly using the *GExiv2* library. (#include <gexiv2/gexiv2.h>)
- Python: Through PyGObject, which allows Python applications to use **GObject-based libraries**. (import gi gi.require_version('GExiv2', '0.10') from gi.repository import GExiv2)
- Java: **does not have direct support** for GExiv2, as GExiv2 is a GObject-based library

Exiv2

Supported Formats: supports a wide range of image formats (JPEG (.jpg, .jpeg); TIFF (.tif, .tiff); PNG (.png); GIF (.gif); BMP (.bmp); WEBP (.webp); HEIF (.heif, .heic); PSD (.psd); RAW formats from major camera manufacturers, including: Canon (.CR2, .CRW), Nikon (.NEF, .NRW), Sony (.ARW, .SR2, .SRF), Fujifilm (.RAF), Panasonic (.RW2), Olympus (.ORF), Pentax (.PEF), Leica (.RWL), Sigma (.X3F))

EXIF Data Extraction: excels at extracting, manipulating, and rewriting EXIF metadata.

Language Interfaces:

- C++: The primary interface for *Exiv2*. You can directly use its API to manage image metadata. (#include <exiv2/exiv2.hpp>)
- Python: Through third-party bindings such as *py3exiv2*, you can utilize Exiv2 in Python projects. (import pyexiv2, image = pyexiv2.Image('example.CR2'), metadata = image.read_metadata(), print(metadata['Exif.Image.Model']))
- Java: **does not have an official Java binding**. (However, you can still use Exiv2 in a Java application through several methods: *JNI, JNA, Using command-line execution*)

Libexif

Supported Formats: primarily focuses on the EXIF metadata found in JPEG and TIFF image files. While it doesn't handle RAW formats directly, it can extract EXIF data from processed JPEG and TIFF images generated from RAW files.

EXIF Data Extraction: provides functions to extract various types of EXIF metadata from supported image formats.

Language Interfaces:

- C: directly accessible from C programs without any additional bindings or wrappers.
- C++: can use *Libexif* by including the necessary header files and linking against the library. (While there are no specific C++ bindings for Libexif, it can be used in C++ projects *without much difficulty*)
- Python: Python developers can access Libexif functionality using language bindings such as *pyexif*.
- Java: For Java developers, *Libexif* can be accessed through **JNI** bindings. JNI allows Java code to call native C functions provided by *Libexif*, enabling Java applications to work with EXIF metadata using the Libexif library.